

March 3, 2010

Ms. Christine Wagner (3HS32)
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U.S. Environmental Protection Agency Region 3
1650 Arch Street
Philadelphia, PA 19103

Subject: Revised Final Trip Report for the
Battlefield Golf Fly Ash Assessment August 2008 Sampling Event
EPA Contract No. EP-S3-05-02
Technical Direction Document Nos. E33-020-08-07-027
and E43-026-09-07-026
Document Tracking No. 0945

Dear Ms. Wagner:

Tetra Tech EM Inc. (Tetra Tech) is submitting a revised version of the Final Trip Report for the Battlefield Golf Fly Ash Assessment, document tracking number (DTN) 0575, dated December 11, 2008. The enclosed revised final trip report reflects the following revisions:

Appendix C, Table 1 – The sample number of MC1GG9 originally reported for sampling location BG08-SW-SW02 was incorrect. The correct sample number of MC1GH13 has been added to this table. Also in Table 1, the contract required quantitation limit (CRQL) for boron was revised from 100 micrograms per liter ($\mu\text{g/L}$) to 50 $\mu\text{g/L}$.

Appendix C, Table 2 – The page numbers were revised. The CRQL for molybdenum has been corrected from 2 milligrams per kilogram (mg/kg) to 0.5 mg/kg and the CRQL for boron has been revised from 0.5 mg/kg to 5 mg/kg .

Appendix C, Table 3 – The concentration of boron in sample number MC02F8 was revised from 28.6 micrograms per liter ($\mu\text{g/L}$) to 26.6 $\mu\text{g/L}$.

Appendix C, Table 5 – The concentration of boron in sample number MC1GG2 was revised from 35.0 $\mu\text{g/L}$ to 35.1 $\mu\text{g/L}$.

Appendix C, Tables 3, 4, 5, and 6 – The page numbers were revised. The CRQL for boron has been revised from 100 $\mu\text{g/L}$ to 50 $\mu\text{g/L}$.

Appendix C, Tables 1, 2, 3, 4, and 5 – The laboratory data qualifier codes of B (indicating compound detected in a field or laboratory blank) and J (indicating that the

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concentration reported is estimated) were added or revised for a number of samples. In addition, the laboratory analytical data qualifier of "UL" (indicating the compound was not detected because the quantitation limit is probably higher) was also added for a number of samples.

No other revisions have been made to the final trip report dated December 11, 2008. The revisions made to the tables found in Appendix B have no impact to the findings or conclusions discussed in the text of the December 11, 2008 report; therefore, no revisions have been made to the text portion of the report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Erik Armistead".

Erik Armistead

Project Manager

Enclosure

cc: TDD File

**REVISED FINAL TRIP REPORT
FOR THE
BATTLEFIELD GOLF FLY ASH ASSESSMENT
CITY OF CHESAPEAKE, VIRGINIA**

Prepared for

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Submitted by

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EPA Contract No. EP-S3-05-02

Technical Direction Document Nos. E33-020-08-07-027 and E43-026-09-07-026
Document Tracking No. 0945

March 3, 2010

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1.0 INTRODUCTION

Under Eastern Area Superfund Technical Assessment and Response Team (START) Contract No. EP-S3-05-02, Technical Direction Document (TDD) No. E33-020-08-07-027, U.S. Environmental Protection Agency (EPA) Region 3 tasked Tetra Tech EM Inc. (Tetra Tech) to assist with assessment activities at the Battlefield Golf Fly Ash Assessment site in the City of Chesapeake, Virginia, in August 2008. The objective of this assessment is to determine whether fly ash used as fill material in the construction process of the golf course property is impacting the upper aquifer and migrating towards nearby residential wells. Under TDD No. E43-026-09-07-026, the December 11, 2008 trip report was revised as detailed in the attached cover letter.

This trip report provides site background information in Section 2.0, describes geology and hydrogeology in Section 3.0, describes site activities in Section 4.0, summarizes analytical results in Section 5.0, and provides conclusions and recommendations in Section 6.0. References are provided after the text.

2.0 BACKGROUND

This section provides background information on the site, including its location, description, and history of site activities and investigations.

2.1 SITE LOCATION

The geographic coordinates of the approximate center of the site are 36.68982 degrees north latitude and 76.17790 degrees west longitude. The Site is surrounded by a mix of residential and agricultural properties, bordered to the north by Whittamore Road, to the south by Murray Drive, and to the west South Centerville Turnpike as shown on Figure 1 - Site Location Map. The Albemarle and Chesapeake Canal Intracoastal Waterway is located approximately 2 miles north of the site.

2.2 SITE DESCRIPTION

The approximately 217-acre site is the location of the currently active Battlefield Golf Club, which opened to the public on October 13, 2007. The site is primarily characterized by open,

grass-covered areas; and an office/parking area. A few man-made ponds created as water hazards are located on site. An aerial photograph appears as Figure 2 - 2005 Aerial Photograph. Development of the Battlefield Golf Club, previously named Etheridge Greens, began in 2001. Prior to development as a golf course, the site was utilized for agricultural use, as it appears in Figure 3 - 1994 Aerial Photograph.

2.3 PREVIOUS SITE INVESTIGATIONS

In 2001, Combustion Products Management (CPM) began planning for construction of an 18-hole golf course on the property. To alter the surface topography for the golf course, CPM planned to use approximately 1.5 million cubic yards of coal combustion byproducts from Dominion's Chesapeake Energy Center (CPM 2002). As part of the initial investigations conducted prior to CPM's purchase of the property and placement of the fly ash, Stokes Environmental Associates, Ltd. (Stokes) was retained to prepare a Phase I Environmental Site Assessment (ESA) of the property. The Phase I investigation was completed by Stokes in 2001. No recognized environmental conditions were documented during the Phase I (Stokes 2001).

In November 2001, Stokes was retained to perform a Baseline Drinking Water Quality Survey in the vicinity of the site. The objective of the survey was to confirm the presence of potable drinking water wells in the vicinity of the site and to identify contamination. As part of the survey, 40 groundwater samples were collected from private drinking water wells randomly selected within 2,000 feet of the site. The samples were analyzed for the following inorganic substances: antimony; arsenic, barium, beryllium, cadmium, chromium, copper, cyanide, fluoride; iron; lead; mercury; manganese; nickel; selenium; silver; thallium; and zinc. Laboratory analytical results indicated that two of the 40 samples contained copper concentrations that were above the MCL and Virginia action level, 14 samples revealed iron above national and Virginia secondary drinking water standards, 10 samples had reported levels of manganese above national and secondary drinking water standards and 4 samples revealed levels of thallium that were at or above the MCL and Virginia primary safe drinking water standard (Stokes 2002). Installation of fly ash at the Battlefield Golf Club was completed approximately 1 year ago.

Residential well water samples were collected in April and again in July 2008 by a contractor for the City of Chesapeake. The 2008 sample results have not been released to the public at this time. Soil and surface water samples were collected from the site and surrounding vicinity in April and May 2008. The soil samples were analyzed for total organic carbon, Toxicity Characteristic Leaching Procedure metals and Synthetic Precipitation Leaching Procedure metals. Surface water samples were collected on and off the site in April, May, and June 2008 and were analyzed for TAL metals, boron, molybdenum and physical parameters. Eight groundwater samples were collected from three monitoring wells on and around the site in May, July, and August 2008. The samples were analyzed for most TAL metals, in addition to boron and molybdenum. All eight samples showed exceedances of the MCL for arsenic and lead. One of the eight samples documented an exceedance of the MCL for beryllium. In July 2008, three samples were collected from three off-site monitoring wells. Of these three samples, two samples document an exceedance of the MCL for lead, and one sample shows an exceedance of the MCL for beryllium (Kimley-Horn 2008).

3.0 SITE GEOLOGY AND HYDROGEOLOGY

This section discusses the local geology and hydrogeology at the site.

3.1 GEOLOGY

The site is located in the Coastal Plain physiographic province of Virginia (Bailey 1999). The Virginia Coastal Plain consists of a wedge of generally unconsolidated Jurassic and younger sediments increasing in thickness from nearly 0 feet in the east where the Coastal Plain borders the Piedmont physiographic province, to more than 6,000 feet beneath the northeastern part of the Eastern Shore Peninsula (Meng and Harsh 1988). The sediments consist of Jurassic and Cretaceous clay, sand, and gravel overlain by a thin sequence of Tertiary marine sands, overlain by Quaternary sand, mud, and gravel (Bailey 1999). In Virginia, the Coastal Plain is dissected by the Chesapeake Bay, which was created approximately 5,000 to 6,000 years ago when the lower course of the Susquehanna River was flooded by rising sea level (Hobbs 2004).

The site is directly underlain by Quaternary Columbia Group sediments (Cedarstrom 1957). The sediments can generally be characterized as unconsolidated fining-upwards depositional

sequences of gravel, sand, silt, and clay (Meng and Harsh 1988). The sediments were deposited in fluvial-deltaic and estuarine settings similar to those that exist in the modern Chesapeake Bay and its tidal tributaries (Meng and Harsh 1988; Bailey 1999).

3.2 HYDROGEOLOGY

Sediments of the Coastal Plain physiographic province are classified into a series of 19 hydrogeologic units designated as aquifers or confining zones (Meng and Harsh 1988; McFarland and Bruce 2006). The uppermost aquifer is the unconfined surficial aquifer (also called the Columbia aquifer), which is composed of unconsolidated interbedded gravel, sand, silt, and clay (Meng and Harsh 1988; McFarland and Bruce 2006). The surficial aquifer is moderately to widely utilized for private domestic wells (McFarland and Bruce 2006). The aquifer is principally recharged by precipitation infiltration. Because of the stratified nature of the sediments, horizontal hydraulic conductivity is generally greater than vertical hydraulic conductivity, and most of the unconfined groundwater flows relatively short distances before discharging to nearby streams and water bodies (McFarland and Bruce 2006). A small amount, however, reaches deeper, confined aquifers. The upper aquifer, known as the Columbia, is underlain by the Yorktown confining zone (Meng and Harsh 1988; McFarland and Bruce 2006). The Yorktown confining zone consists of finer-grained sediment and is reported to be approximately 25 feet thick in the vicinity of the site (McFarland and Bruce 2006). The Yorktown confining zone is underlain by the Yorktown-Eastover aquifer, which is composed of thick to massively bedded shelly sand and lesser clay intervals (Meng and Harsh 1988; McFarland and Bruce 2006).

Commercial well logs approximately 2.5 miles northwest of the site described by Meng and Harsh indicate that the surficial aquifer near the site extends from ground surface to 70 feet below ground surface (bgs) (Meng and Harsh 1988). According to the well logs, the Yorktown confining zone is approximately 25 feet thick (from 70 to 95 feet bgs). The Yorktown-Eastover aquifer is documented to begin at 95 feet bgs and continue to a depth of 358 feet bgs. Private domestic water supply wells are being supplied from both the Columbia and Yorktown-Eastover aquifers within the vicinity of the Battlefield Golf Fly Ash Assessment site, though information regarding all wells in the vicinity is incomplete (City of Chesapeake 2008).

During the assessment of the Battlefield Golf Fly Ash Assessment site, the upper aquifer was gauged between 3 and 8 feet bgs, approximately 15 feet above mean sea level (AMSL). Based on groundwater gauging data and an elevation survey of temporary monitoring points completed during the assessment, groundwater was determined to flow south-southeast. A map showing the estimated groundwater flow direction is included as Figure 4, Groundwater Elevation Map, in Appendix A.

4.0 SITE ACTIVITIES

This section discusses site activities performed during the August 2008 site assessment completed by Tetra Tech, including temporary groundwater monitoring point installation, soil and groundwater sampling, a groundwater elevation survey, and potable water sampling. Tetra Tech documented site activities in accordance with Tetra Tech Standard Operating Procedure (SOP) No. 024, “Recording of Notes in Field Logbook” (Tetra Tech 1999e).

4.1 TEMPORARY GROUNDWATER MONITORING POINT INSTALLATION

On August 25, 2008, Tetra Tech, Davidson Well Drilling of Bedford, Virginia, and EPA mobilized to the site to begin work at the Battlefield Golf Fly Ash Assessment site. On August 25 and 26, 2008, 13 borings were advanced using a truck-mounted direct-push geoprobe along the perimeter of the Battlefield Golf Club property. Tetra Tech and Davidson Well Drilling installed the temporary groundwater monitoring points in accordance with Tetra Tech SOP No. 054, “Using the Geoprobe System” (Tetra Tech 1999h). Temporary monitoring points were constructed in the boreholes in accordance with EPA’s “Groundwater Sampling and Monitoring with Direct Push Technologies” (EPA 2005). Boring locations are shown on Figure 4, Groundwater Elevation Map, in Appendix A. All borings were advanced to a depth of approximately 12 feet bgs. Continuous sampling using 4-foot acetate sleeves allowed for documentation of soil lithology and sampling of soil cores at depth. The lithology of the soil encountered in all of the borings consisted of silty-sand. Water was encountered in the borings between 4.5 and 7 feet bgs. Boring logs are included in Appendix B.

Nondedicated materials (such as steel rods) used during advancement of the bore holes were decontaminated between each use in accordance with Tetra Tech SOP No. 002, “General

Equipment Decontamination” (Tetra Tech 1999f). Two rinsate blank samples (BG08-RB01 and BG08-RB02) were collected from the steel rods following decontamination and analyzed for target analyte list(TAL) metals, boron, and molybdenum.

A 1-inch polyvinyl chloride (PVC) temporary groundwater monitoring point was installed in each of the 13 boring locations. Each monitoring point was screened at the bottom 5 feet of the well casing with a 0.02-inch slotted screen. Each monitoring point was also installed using a sand filter pack from approximately 2 feet bgs to termination. Bentonite was used to seal the sand pack to ground surface. A 1-inch PVC cap was installed on each monitoring point to seal the interior of the casing.

Each temporary monitoring point was left in place for groundwater sampling and gauging until August 29, 2008. Davidson Well Drilling removed all 13 monitoring points and filled the boreholes with soil produced during the initial boring advancement. In cases where the amount of existing soil did not completely fill the borehole, bentonite was used to seal the hole to ground surface.

4.2 SOIL SAMPLING

Tetra Tech collected a total of 15 subsurface soil samples, including two split samples, as shown in Table 1. Sample locations are shown on Figure 4 - Ground Water Elevation Map. One sample was collected from each of the 13 borings advanced on site in accordance with Tetra Tech SOP No. 005, “Soil Sampling” (Tetra Tech 1999g). Sampling locations were selected from discrete intervals based on field observations and the perceived depth of the water table during monitoring point installation. A soil sample was collected in the zone located directly above the first water encountered in the boring. At each of the sampling locations, Tetra Tech collected approximately 16 ounces of soil and homogenized the soil in a dedicated aluminum pan. Following soil homogenization for each sample, soil was placed into two certified-clean, labeled, 8-ounce clear wide-mouthed (CWM) glass jars for TAL metals, cyanide, boron, and molybdenum analyses. Dedicated plastic scoops and nitrile gloves were used during sampling and transfer of homogenized soil to jars. All sampling equipment was dedicated, eliminating the potential for cross-contamination or the need for rinsate sample analysis.

Table 1 summarizes the sample identifiers, laboratory identifiers, sampling dates and times, and analytical methods for soil samples collected during the Battlefield Golf Fly Ash assessment in August 2008.

TABLE 1
SOIL SAMPLING SUMMARY

Sample Identifier	Laboratory Identifier	Sample Date	Collection Time	Analysis
BG08-SS-MP01	MC02J7	8/25/2008	1018	TAL metals, boron, molybdenum
BG08-SS-MP02	MC02J8	8/25/2008	1135	TAL metals, boron, molybdenum
BG08-SS-MP03	MC02J9	8/25/2008	1215	TAL metals, boron, molybdenum
BG08-SS-MP04	MC02K0	8/25/2008	1324	TAL metals, boron, molybdenum
BG08-SS-MP05	MC02K1	8/25/2008	1415	TAL metals, boron, molybdenum
BG08-SS-MP06	MC02K2	8/25/2008	1507	TAL metals, boron, molybdenum
BG08-SS-MP06S	MC02M1	8/25/2008	1507	TAL metals, boron, molybdenum
BG08-SS-MP07	MC02K3	8/25/2008	1557	TAL metals, boron, molybdenum
BG08-SS-MP08	MC02K4	8/25/2008	1710	TAL metals, boron, molybdenum
BG08-SS-MP09	MC02K5	8/26/2008	0801	TAL metals, boron, molybdenum
BG08-SS-MP10	MC02K6	8/26/2008	0835	TAL metals, boron, molybdenum
BG08-SS-MP11	MC02K7	8/26/2008	0936	TAL metals, boron, molybdenum
BG08-SS-MP12	MC02K8	8/26/2008	1020	TAL metals, boron, molybdenum
BG08-SS-MP12S	MC02M3	8/26/2008	1020	TAL metals, boron, molybdenum
BG08-SS-MP13	MC02K9	8/26/2008	1110	TAL metals, boron, molybdenum

Notes:

BG08 = Battlefield Golf 2008 Assessment

SS = Soil sample

MP = Monitoring point

TAL = Target analyte list

4.3 GROUNDWATER SAMPLING

On August 28 and 29, 2008, Tetra Tech and EPA collected a total of 20 groundwater samples, including one duplicate and three split samples for quality assurance/quality control (QA/QC), from on-site temporary monitoring points and existing monitoring wells. Groundwater samples were collected in accordance with Tetra Tech SOP No. 010, "Groundwater Sampling" (Tetra Tech 2000b). All groundwater samples were collected using a peristaltic pump. Groundwater sample information is summarized in Table 2. Sample locations are shown on Figure 4 - Ground Water Elevation Map.

Prior to sampling, each monitoring point was purged three times. After purging, water quality measurements were collected from each location. Measurements include temperature, specific

conductance, dissolved oxygen, pH, turbidity, and oxidation-reduction potential and are summarized in Table 3. Water quality measurements were collected using a Horiba U-10 water quality meter in accordance with Tetra Tech SOPs No. 011, “Field Measurement of Water Temperature,” No. 012, “Field Measurement of pH,” No. 013, “Field Measurement of Specific Conductance,” and No. 088, “Field Measurement of Water Turbidity” (Tetra Tech 1999c, 1999a, 1999b, 1999d). During sampling activities, temperature readings were not acquired from all monitoring points because of equipment failure.

After purging and collecting water quality measurements from each well, Tetra Tech collected groundwater samples by pumping groundwater directly into two certified-clean, labeled, 32-ounce nalgene high-density, polyethylene wide-mouthed containers preserved with nitric acid. Groundwater samples were collected for TAL metals, boron, and molybdenum analyses. One of the two containers was filtered in the field with a 0.45-micron filter prior to preservation. Dedicated tubing and nitrile gloves were used during sampling. All sampling equipment that came in contact with groundwater was dedicated, eliminating the potential for cross-contamination or the need for rinsate sample analysis.

Table 2 summarizes the sample identifiers, laboratory identifiers, purge volume, sampling dates and times, and analytical methods for groundwater samples collected during the Battlefield Golf Fly Ash assessment in August 2008.

TABLE 2
GROUNDWATER SAMPLING SUMMARY

Sample Identifier	Laboratory Identifier	Purge Volume	Sample Date	Collection Time	Analysis
BG08-GW-MP01	MC02A1, MC1GF1	2 gallons	8/28/2008	1240	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP02	MC02A2, MC1GF2	3 gallons	8/29/2008	1115	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP03	MC02A3, MC1GF3	2.5 gallons	8/29/2008	1000	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP03S	MC02L2	2.5 gallons	8/29/2008	1000	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP04	MC02A4, MC1GF4	2.5 gallons	8/28/2008	1406	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP05	MC02A5, MC1GF5	2 gallons	8/28/2008	1550	Total and Dissolved - TAL metals, boron, molybdenum

TABLE 2
GROUNDWATER SAMPLING SUMMARY

Sample Identifier	Laboratory Identifier	Purge Volume	Sample Date	Collection Time	Analysis
BG08-GW-MP06	MC02A6, MC1GF6	2.5 gallons	8/28/2008	1747	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP07	MC02A7, MC1GF7	2 gallons	8/28/2008	1810	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP08	MC02A8, MC1GF8	2 gallons	8/29/2008	0910	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP08S	MC02L3	2 gallons	8/29/2008	0910	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP09	MC02A9, MC1GF9	2.5 gallons	8/29/2008	1050	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP10	MC02B0, MC1GG0	3 gallons	8/29/2008	1150	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP11	MC02B1, MC1GG1	2 gallons	8/28/2008	1348	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP12	MC02B2, MC1GG2	2 gallons	8/28/2008	1305	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MP13	MC02B3, MC1GG3	2.5 gallons	8/28/2008	1325	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MW01	MC02B4, MC1GG4	10 gallons	8/29/2008	1555	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MW02	MC02B5, MC1GG5	10 gallons	8/29/2008	1350	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MW02D	MC02B6, MC1GG6	10 gallons	8/29/2008	1350	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MW03	MC02B7, MC1GG7	10 gallons	8/29/2008	1450	Total and Dissolved - TAL metals, boron, molybdenum
BG08-GW-MW03S	MC02L4	10 gallons	8/29/2008	1450	Total and Dissolved - TAL metals, boron, molybdenum

Notes:

BG08 = Battlefield Golf 2008 Assessment

MP = Monitoring point

TAL = Target analyte list

GW = Groundwater sample

MW = Monitoring well

Table 3 summarizes the water quality measurements collected from groundwater monitoring points during the August 2008 site assessment, including monitoring locations, water temperature, specific conductance, dissolved oxygen levels, pH levels, oxidation-reduction potential, and turbidity.

TABLE 3
GROUNDWATER QUALITY MEASUREMENTS

Monitoring Location	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Turbidity
MP01	22.48°C	353 µS/cm	3.09 mg/L	6.01	-463.2	8.9 NTU
MP02	NR	343 µS/cm	0.98 mg/L	5.98	-59.7	18.1 NTU
MP03	NR	650 µS/cm	0.84 mg/L	6.06	-61.6	11.4 NTU
MP04	23.70°C	255 µS/cm	1.64 mg/L	5.58	-325.8	3.9 NTU
MP05	21.17°C	396 µS/cm	2.88 mg/L	5.51	-246.9	8.8 NTU
MP06	20.30°C	702 µS/cm	1.86 mg/L	5.67	-308.9	30.36 NTU
MP07	NR	586 µS/cm	4.40 mg/L	6.07	-101.2	15.6 NTU
MP08	NR	443 µS/cm	0.80 mg/L	6.12	-55.4	4.3 NTU
MP09	NR	390 µS/cm	0.58 mg/L	5.48	-31.9	3.3 NTU
MP10	NR	367 µS/cm	0.85 mg/L	5.85	-33.3	9.8 NTU
MP11	23.93°C	275 µS/cm	1.74 mg/L	5.56	-401.5	5.5 NTU
MP12	23.09°C	469 µS/cm	1.32 mg/L	6.01	-547.6	8.3 NTU
MP13	23.55°C	366 µS/cm	1.15mg/L	5.89	-521.8	4.1 NTU
MW01	19.41°C	294 µS/cm	3.90 mg/L	5.34	-46.5	2.1 NTU
MW02	19.28°C	589 µS/cm	5.08 mg/L	6.19	-74.6	10.5 NTU
MW03	20.07°C	534 µS/cm	1.46 mg/L	6.05	-67.4	22.1 NTU

Notes:

µS/cm = Microsiemens per centimeter

mg/L = Milligrams per liter

MW = Monitoring well

NTU = Nephelometric turbidity unit

°C = Degrees Celsius

MP = Monitoring point

NR = Not recorded

4.4 SURFACE WATER SAMPLING

On August 29, 2008, Tetra Tech collected a total of three surface water samples (including one split sample) from an unnamed stream that runs west to east along the southern boundary of the site. As shown on Figure 5 in Appendix A, BG08-SW-SW01 was collected at the southwest corner of the site, directly adjacent to South Centerville Turnpike. BG08-SW-SW02 and BG08-SW-SW02S were collected at the southeast corner of the site. Each surface water sample was collected using a peristaltic pump.

Water quality measurements were collected using a Horiba U-10 water quality meter in accordance with Tetra Tech SOPs No. 011, “Field Measurement of Water Temperature,” No. 012, “Field Measurement of pH,” No. 013, “Field Measurement of Specific Conductance,” and No. 088, “Field Measurement of Water Turbidity” (Tetra Tech 1999c, 1999a, 1999b, 1999d).

Water quality measurements are summarized in Table 4. During sampling activities, temperature readings were not acquired from surface water sampling locations because of equipment failure.

After collecting water quality measurements, Tetra Tech collected surface water samples by pumping surface water directly into two certified-clean, labeled, 32-ounce nalgene high-density, polyethylene wide-mouthed containers preserved with nitric acid. Surface water samples were collected for TAL metals, boron, and molybdenum analyses. One of the two sample containers was filtered in the field with a 0.45-micron filter prior to preservation. Dedicated tubing and nitrile gloves were used for sampling. All sampling equipment that came in contact with surface water was dedicated, eliminating the potential for cross-contamination or the need for rinsate sample analysis.

Table 4 summarizes the water quality measurements collected from surface water monitoring points during the August 2008 site assessment, including monitoring locations, water temperature, specific conductance, dissolved oxygen levels, pH levels, oxidation-reduction potential, and turbidity.

TABLE 4
SURFACE WATER QUALITY MEASUREMENTS

Monitoring Location	Temperature	Specific Conductance	Dissolved Oxygen	pH	Oxidation-Reduction Potential	Turbidity
SW01	NR	313 μ S/cm	2.79 mg/L	4.35	356	11.5 NTU
SW02	NR	431 μ S/cm	2.20 mg/L	4.26	399.8	89 NTU
SW02S	NR	431 μ S/cm	2.20 mg/L	4.26	399.8	89 NTU

Notes:

μ S/cm = Microsiemens per centimeter

mg/L = Milligrams per liter

NTU = Nephelometric turbidity unit

$^{\circ}$ C = Degrees Celsius

NR = Not recorded

SW = Surface water

4.5 POTABLE WATER SAMPLING

Between August 25 and 29, 2008, Tetra Tech and EPA collected samples from residential potable water wells located within the vicinity of the site. The residential wells were located primarily south and west of the site, along Murray Drive and Land of Promise Road. Three

samples were collected north of the site, on Blue Ridge Drive. Based on the groundwater flow in the vicinity of the site, these samples can be considered background samples. The exact locations where the residential well samples were collected is confidential information. A total of 70 residential well samples were collected, including four duplicate samples and four split samples as part of our quality assurance/quality control plan. All residential well samples were collected in accordance with EPA SOP No. SESDPROC-305-R1, "Potable Water Supply Sampling" (EPA 2007). Tetra Tech purged all water systems for a minimum of 15 minutes prior to collecting the samples. Table 5 summarizes the potable water samples collected from residential wells during August 2008 sampling activities.

Samples were collected into one certified-clean, labeled, 32-ounce nalgene high-density, polyethylene wide-mouthed container preserved with nitric acid. Potable water samples were collected for TAL metals, boron, and molybdenum analyses. Tetra Tech personnel used nitrile gloves during sampling. All sampling equipment was dedicated, eliminating the potential for cross-contamination or the need for rinsate sample analysis.

Table 5 summarizes the sample identifiers, laboratory identifiers, sampling dates and times, and analytical methods for potable water samples collected during the Battlefield Golf Fly Ash assessment in August 2008.

TABLE 5
POTABLE WATER SAMPLING SUMMARY

Sample Identifier	Laboratory Identifier	Sample Date	Collection Time	Analysis
(b) (6)	(b) (6)	8/25/2008	0927	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/25/2008	0959	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1645	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1645	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1040	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1043	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/25/2008	1124	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/25/2008	1131	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1328	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1336	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1416	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1515	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1623	TAL metals, boron, molybdenum

TABLE 5
POTABLE WATER SAMPLING SUMMARY

Sample Identifier	Laboratory Identifier	Sample Date	Collection Time	Analysis
(b) (6)	(b) (6)	8/25/2008	1919	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/25/2008	1919	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/25/2008	2015	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/25/2008	2015	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	0746	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	0819	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	0918	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	0915	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1026	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	1050	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1133	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	1126	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	1126	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1316	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1718	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	1750	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1750	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1851	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	1859	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	1913	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	0918	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/27/2008	1040	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/27/2008	1056	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1019	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1124	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1156	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1224	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1318	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1339	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1421	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/27/2008	1421	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1458	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/26/2008	1320	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1520	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/27/2008	1639	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/27/2008	1707	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1715	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1818	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1930	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1920	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1915	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/25/2008	1915	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/29/2008	1012	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/29/2008	1012	TAL metals, boron, molybdenum

TABLE 5
POTABLE WATER SAMPLING SUMMARY

Sample Identifier	Laboratory Identifier	Sample Date	Collection Time	Analysis
(b) (6)	(b) (6)	8/28/2008	1747	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/28/2008	0917	TAL metals, boron, molybdenum
(b) (6)	(b) (6)(b) (6)	8/26/2008	1013	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/26/2008	1013	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1541	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/27/2008	1613	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/28/2008	0945	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/28/2008	1023	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/28/2008	1029	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/29/2008	1119	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/29/2008	1119	TAL metals, boron, molybdenum
(b) (6)(b) (6)	(b) (6)	8/29/2008	1130	TAL metals, boron, molybdenum
(b) (6)	(b) (6)	8/28/2008	1113	TAL metals, boron, molybdenum

Notes:

BG08 = Battlefield Golf 2008 Assessment

PW = Potable water sample

TAL = Target analyte list

4.6 SAMPLE MANAGEMENT

Samples were handled and packaged in accordance with the Tetra Tech SOP No. 019, “Packaging and Shipping Samples” (Tetra Tech 2000a) and with the Tetra Tech “Quality Assurance Project Plan (QAPP) for START” (Tetra Tech 2006). All shipping containers were properly labeled with EPA chain-of-custody seals and delivered with signed chain-of-custody forms and appropriate hazard warnings for laboratory personnel. Samples were submitted to Chemtech Consulting Group of Mountainside, New Jersey, under Contract Laboratory Program (CLP) Case Number 37813 for inorganic analysis on September 2, 2008. As part of the project QA/QC plan, ten split samples were submitted to A4 Scientific, of The Woodlands, Texas, under CLP Case Number 37814 for inorganic analysis on September 2, 2008. Appropriate samples were preserved and all samples were kept on ice during delivery to assigned laboratories.

5.0 ANALYTICAL RESULTS

This section summarizes analytical results for the samples collected during the Battlefield Golf Fly Ash Assessment site August 2008 sampling event.

All sample analytical results were received by October 22, 2008. Data summary tables are included in Appendix C, Tables 1 through 6. The CLP analytical data packages are provided in Appendix D. Data were qualified as part of laboratory QC procedures during data validation by the EPA Region 3 Office of Analytical Services and Quality Assurance Branch.

As shown in Appendix C Table 1, analytical results for the surface water samples collected in the unnamed stream did not reveal any metals significantly above expected concentrations. Boron was not detected above the contract-required quantitation limit (CRQL) in any of the samples.

As shown in Appendix C Table 2, soil samples collected from borings installed on the site did not show significantly elevated concentrations of metals when compared to background levels for metals in Virginia soils (VADEQ 2006).

The groundwater analytical data is provided in Appendix C Tables 3 (residential wells), 4 (on site groundwater total metals) and 5 (on site groundwater dissolved metals). Tetra Tech compared the groundwater and potable well analytical data to EPA MCLs established for public drinking water systems. Four of the seventy samples collected from residential wells had concentrations greater than the action level for lead. Lead is regulated by a treatment technique that requires public water systems to control the corrosiveness of their water. If more than 10 percent of tap water samples exceed the action level, water systems must take additional steps. The action level for lead is 15 micrograms per liter ($\mu\text{g/L}$). Three of the four samples were elevated slightly over the action level, ranging from 17.9 to 18.9 $\mu\text{g/L}$. One of the four samples was greater than four times the action level, at 67.1 $\mu\text{g/L}$. No other residential potable well samples exceeded the MCLs for any detected analyte. Three residential potable water samples (b) (6)(b) (6)(b) (6)(b) (6) (duplicate sample), and (b) (6) were collected from two wells located upgradient of the site. The concentrations of substances commonly associated with fly ash, including most TAL metals, molybdenum, and boron detected in these upgradient wells were comparable and in the case of lead, (detected at 10.3 $\mu\text{g/L}$) above the concentrations reported in downgradient residential wells.

Of the 13 temporary monitoring points and three monitoring wells sampled on the Battlefield Golf property, three groundwater samples exceeded the MCL of 10 $\mu\text{g/L}$ for total arsenic. Those

three samples ranged in concentrations of total arsenic from 10.7 to 19.8 µg/L. One of the three samples also exceeded the MCL for dissolved arsenic (10 µg/L), with a concentration of 21.0 µg/L. Analytical results from samples collected from seven of the 13 groundwater sampling locations exceeded the action level for total lead (15 µg/L). Those seven samples ranged in concentrations of total lead from 15.6 to 28.3 µg/L. Two of the samples exceeded both the MCLs for total arsenic and total lead. No other exceedance of MCLs for total or dissolved metals was detected in samples collected from on site wells and monitoring points.

As shown in Appendix C Table 6, analytical results of rinsate blank samples identified concentrations of iron ranging from 124 to 571 µg/L. Concentrations of calcium, magnesium, manganese, and zinc were identified at concentrations less than the CRQL.

6.0 CONCLUSION AND RECOMMENDATIONS

As part of this assessment, Tetra Tech collected soil samples from 13 borings, groundwater samples from 13 monitoring points and 3 monitoring wells, surface water samples from two locations, and residential potable water samples from 55 residential properties located in the vicinity of the Battlefield Golf Fly Ash site. Samples were analyzed for TAL metals, molybdenum and boron. Analytical results indicated the exceedance of the lead MCL in 4 residential wells and exceedances of the lead and/or arsenic MCL in the groundwater samples collected from temporary monitoring points and wells.

Maximum concentrations of lead and arsenic detected in samples collected during the August 2008 sampling event are greater than concentrations identified during sampling conducted in 2001; however, 15 additional samples were collected in 2008 and the majority of concentrations detected were approximately equal to the concentrations reported in 2001. In addition, the concentrations of lead and arsenic, both naturally-occurring compounds in groundwater, in 3 samples collected from wells located upgradient of the site was comparable to downgradient levels, and in the case of lead, often higher. Lead in private drinking water wells may come from various sources, including the metal storage tanks and pipes that may contain lead solder.

The concentrations of metals in groundwater change over time naturally because groundwater is not stagnant. Groundwater flows and is recharged from precipitation and surface water bodies.

The source of the groundwater in a given well is going to change over time; therefore, to determine trends within the upper Columbia aquifer in the vicinity of the site Tetra Tech recommends that additional sampling events be scheduled. Sampling parameters should include TAL metals, molybdenum, boron, and water quality characteristics. Tetra Tech also recommends permanent monitoring wells be installed in both the Columbia and Yorktown-Eastover aquifers, both upgradient and downgradient of the Battlefield Golf Club.

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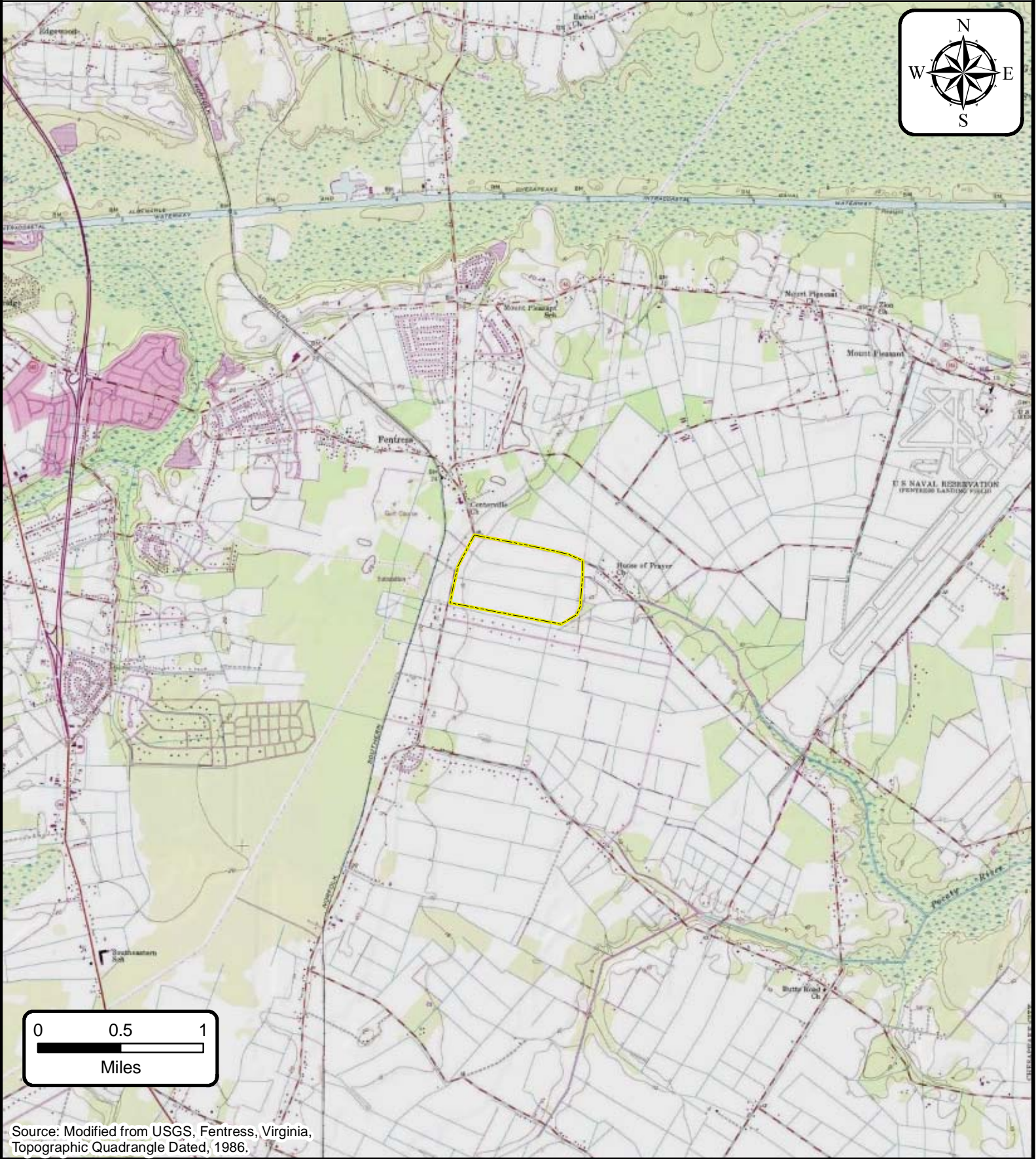
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APPENDIX A

FIGURES



Source: Modified from USGS, Fentress, Virginia, Topographic Quadrangle Dated, 1986.

Approximate Site Location = 



Legend

 Site Boundry

**Golf Course
City of Chesapeake, Virginia**

**Figure 1
Site Location Map**

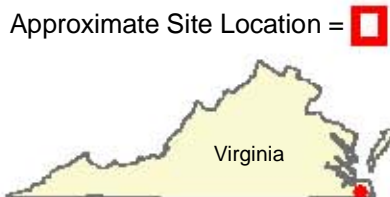
TDD No. 0210200807025
EPA Contract No. EP-S3-05-02

Map created on August 11, 2008
by A. Dye, Tetra Tech EMI





Source: Modified from USGS, 2005.
Note: Photograph was taken before
golf course was completed.



Legend

 Site Boundry

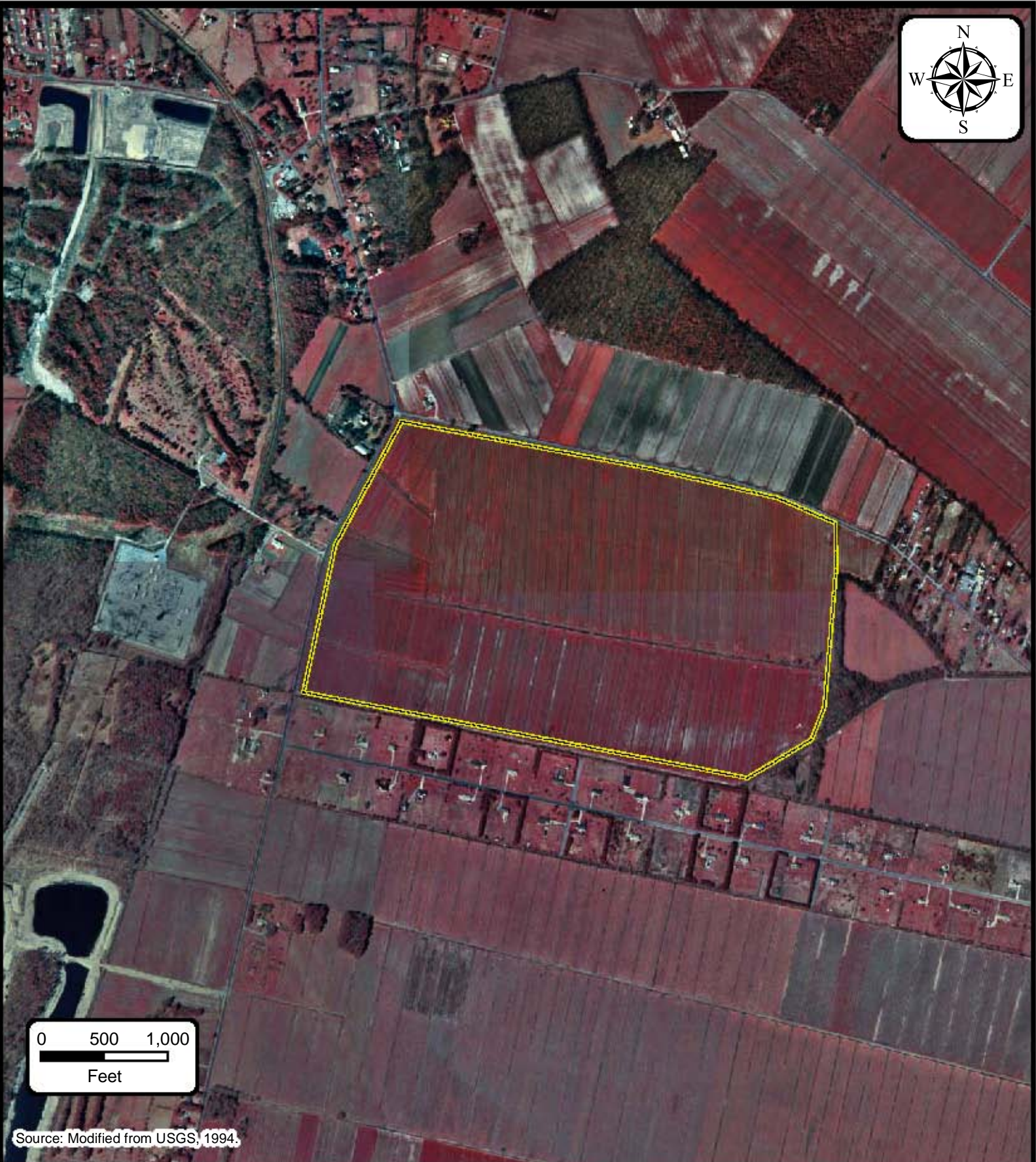
**Golf Course
City of Chesapeake, Virginia**

**Figure 2
2005 Aerial Photograph**

TDD No. 0210200807025
EPA Contract No. EP-S3-05-02

Map created on December 10,
2008 by A. Dye, Tetra Tech EMI





0 500 1,000
Feet

Source: Modified from USGS, 1994.

Approximate Site Location = 



Legend

 Site Boundry

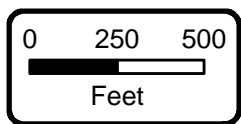
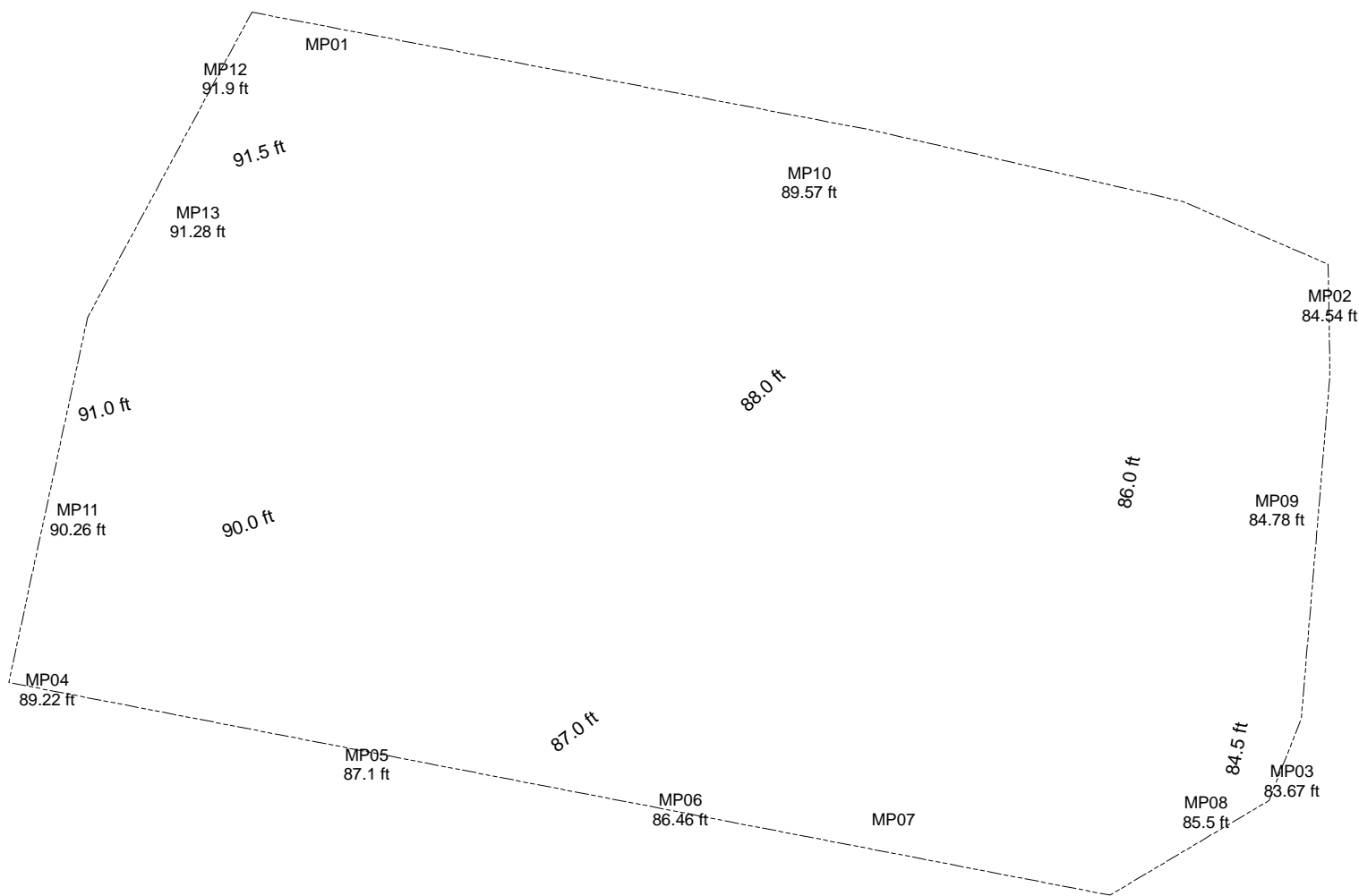
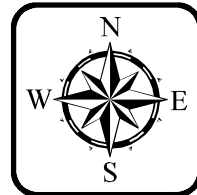
Golf Course City of Chesapeake, Virginia

Figure 3
1994 Aerial Photograph

TDD No. 0210200807025
EPA Contract No. EP-S3-05-02

Map created on December 10,
2008 by A. Dye, Tetra Tech EMI





Source: Modified from USGS, 2005.
Note: Photograph was taken before golf course was completed.

Note: Groundwater elevation based on a relative benchmark and are not based on actual sea-level.

Approximate Site Location =



Legend

- Monitoring Well
- Groundwater Elevation Contour
- Site Boundry
- Groundwater Flow Direction

Golf Course City of Chesapeake, Virginia

Figure 4
Groundwater Elevation Map

TDD No. 0210200807025
EPA Contract No. EP-S3-05-02

Map created on December 5, 2008
by A. Dye, Tetra Tech EMI





Source: Modified from USGS, 2005. Note: Photograph was taken before golf course was completed.

0 250 500 750
Feet

Approximate Site Location = ■

Virginia



Battlefield Golf Club
Chesapeake, Virginia









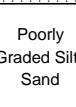
Figure 5
Surface Water Sampling Location Map




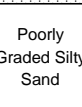
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Map created on December 11, 2008
by D. Call, Tetra Tech EM Inc.



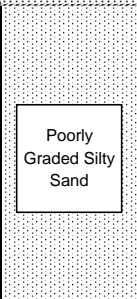



APPENDIX B
BORING LOG





 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 1 of 13	
		Boring No. MP01		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 7	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	41/48	NA		Monitoring point casing stick-up to 2.0' above surface. 0' - 4.0' SM - medium brown silty sand to dark brown silty sand.
					0' - 3.0' - bentonite pellets in annulus
					3.0' - 11.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA	 	5.0' - 6.0' SM - medium to dark brown silty sand. 6.0' - 8.0' SP - light brown poorly graded silty sand, wet from 7 0' - 8.0'
					6.0' - 11 0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - light brown poorly graded silty sand
					
12					Boring terminated at 12.0'. Slight boring collapse, and MP01 set at 11 0'.
NA = Not applicable					









 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 2 of 13	
		Boring No. MP02		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 6.5	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA	 Silty Sand	Monitoring point casing stick-up to 1.5' above surface. 0' - 2.5' SM - dark brown silty sand 2.5' - 4.0' SM - light to medium brown silty sand 0' - 2.0' - bentonite pellets in annulus 2.0' - 11.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA	 Poorly Graded Silty Sand	4.0' - 5.0' SM - light to medium brown silty sand 5.0' - 8.0' SP - gray poorly graded silty sand, wet at 6.5' 6.0' - 11.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA	 Poorly Graded Silty Sand	8.0' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. Slight boring collapse, and MP02 set at 11.0'.


 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 3 of 13	
		Boring No. MP03		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs):	
Borehole Backfill Method & Interval:		Completed as 1-inch diameter monitoring point.		6	









DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA	 Silty Sand	Monitoring point casing stick-up to 1 0' above surface. 0' - 3 0' SM - light brown silty sand 3 0' - 4.0' SM - light to medium brown silty sand 0' - 3.0' - bentonite pellets in annulus 3 0' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		 Poorly Graded Silty Sand
8	8'-12'	48/48	NA	 Poorly Graded Silty Sand	
12					


 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 4 of 13	
		Boring No. MP04		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs):	
Borehole Backfill Method & Interval:		Completed as 1-inch diameter monitoring point.		6	


DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		Monitoring point casing stick-up to 1.5' above surface. 0' - 2.0' SM - light brown silty sand, trace gravel 2.0' - 4.0' SM - light to medium brown silty sand 0' - 3.5' - bentonite pellets in annulus 3.5' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4.0' - 8.0' SM - light to medium brown silty sand 7.0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 10.5' SM - light brown silty sand 10.5' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP04 set at 12.0'.




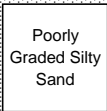
 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 5 of 13	
		Boring No. MP05		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 5.5	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		Monitoring point casing stick-up to 1.5' above surface.
					0' - 4.0' SM - medium to dark brown silty sand
					0' - 2.0' - bentonite pellets in annulus
					2.0' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4.0' - 4.5' SM - medium to dark brown silty sand
					4.5' - 8.0' SP - gray poorly graded silty sand, saturated
					7.0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - gray poorly graded silty sand, saturated
					
12					Boring terminated at 12.0'. MP05 set at 12.0'.






 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 6 of 13	
		Boring No. MP06		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs):	
Borehole Backfill Method & Interval:		Completed as 1-inch diameter monitoring point.		7	






DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		Monitoring point casing stick-up to 1.5' above surface. 0' - 4.0' SM - light to medium brown silty sand
					0' - 2.0' - bentonite pellets in annulus
					2.0' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4.0' - 6.0' SM - dark brown to gray silty sand
					6.0' - 8.0' SM - light brown to gray silty sand, saturated
					7.0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - gray poorly graded silty sand, saturated
					
12					Boring terminated at 12.0'. MP06 set at 12.0'.





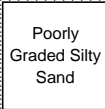
 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 7 of 13	
		Boring No. MP07		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 6.5	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		Monitoring point casing stick-up to 1.5' above surface. 0' - 4.0' SM - light to medium brown silty sand
				Silty Sand	0' - 2.5' - bentonite pellets in annulus
					2.5' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4.0' - 6.5' SM - dark brown to gray silty sand 6.5' - 8.0' SP - gray poorly graded silty sand, moist
				Silty Sand	
					7.0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - gray poorly graded silty sand, saturated
				Poorly Graded Silty Sand	
12					Boring terminated at 12.0'. MP07 set at 12.0'.


 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 8 of 13	
		Boring No. MP08		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/25/2008		Date Finished: 8/25/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs):	
Borehole Backfill Method & Interval:		Completed as 1-inch diameter monitoring point.		7	







DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		0' - 4' SM - light brown silty sand
					0' - 2.5' - bentonite pellets in annulus
					2.5' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4' 0' - 7.0' SM - light brown to red brown silty sand 7' 0' - 8.0' SM - light brown to gray silty sand, moist
					7' 0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP08 set at 12.0'.






 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 9 of 13	
		Boring No. MP09		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/26/2008		Date Finished: 8/26/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 6.5	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		0' - 4' SM - light to medium brown silty sand
					0' - 3.0' - bentonite pellets in annulus
					3.0' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4.0' - 6.0' SM - dark brown silty sand 6.0' - 8.0' SM - light brown to gray silty sand, moist
					7.0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP09 set at 12.0'.

 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 10 of 13	
		Boring No. MP10		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)(b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/26/2008		Date Finished: 8/26/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 4.5	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		0' - 4.0' SM - medium to dark brown silty sand, some gravel
					0' - 1.5' - bentonite pellets in annulus
					1.5' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4.0' - 5.0' SM - medium brown silty sand, moist at 4.5' 5.0' - 8.0' SM - brown to gray silty sand, saturated
8	8'-12'	48/48	NA		7.0' - 12.0' - screened interval (0.020-inch slotted)
					8.0' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP10 set at 12.0'.

 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 11 of 13	
		Boring No. MP11		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/26/2008		Date Finished: 8/26/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 5	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		0' - 4' SM - medium to dark brown silty sand, trace gravel
					0' - 3.0' - bentonite pellets in annulus
					3.0' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4.0' - 5.0' SM - medium brown silty sand 5.0' - 8.0' SM - medium brown silty sand, moist at 5.0'
					7.0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - light brown to gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP11 set at 12.0'.

 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 12 of 13	
		Boring No. MP12		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/26/2008		Date Finished: 8/26/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs):	
Borehole Backfill Method & Interval:		Completed as 1-inch diameter monitoring point.		5	

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		0' - 4' SM - medium to dark brown silty sand, trace gravel
					0' - 2.5' - bentonite pellets in annulus
					2.5' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4' 0' - 5.0' SM - medium brown silty sand 5' 0' - 8.0' SM - light brown to gray silty sand, moist at 5.0'
					7' 0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - light brown to gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP12 set at 12.0'.

 7 Creek Parkway, Suite 700 Boothwyn, Pennsylvania 19061		Project No. 103X9021020FP.0807027		Page 13 of 13	
		Boring No. MP13		Drilling Rig: Geoprobe	
		Contractor: Davidson Drilling, Inc.		Drilling Method: Direct-push	
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike Chesapeake, VA 23322		Drill Crew: (b) (4)		Sampling Method: Continuous soil sampling, 4' acetate sleeves	
		Date Started: 8/26/2008		Date Finished: 8/26/2008	
Surface Elevation: N/A		Logged by: T. Payne		First water during drilling (feet bgs): 5.5	
Borehole Backfill Method & Interval: Completed as 1-inch diameter monitoring point.					
DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
0	0'-4'	48/48	NA		Monitoring point casing stick-up to 2' 0" above surface.
					0' - 4' 0' SM - medium to dark brown silty sand, trace gravel
					0' - 2.5' - bentonite pellets in annulus
					2.5' - 12.0' - sand filter pack in boring annulus
4	4'-8'	48/48	NA		4' 0' - 5.5' SM - medium brown silty sand
					5' 5' - 8.0' SM - light brown to gray silty sand, moist at 5.5'
					7' 0' - 12.0' - screened interval (0.020-inch slotted)
8	8'-12'	48/48	NA		8.0' - 12.0' SP - light brown to gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP13 set at 12.0'.

APPENDIX C
DATA SUMMARY TABLES

TABLE 1
ANALYTICAL RESULTS
SURFACE WATER SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

		TOTAL		TOTAL		TOTAL		DISSOLVED		DISSOLVED		DISSOLVED	
Sample Number :		MC02B8		MC02B9		MC02L5		MC1GG8		MC1GG9		MC1GH13	
Sampling Location :		BG08-SW-SW01		BG08-SW-SW02		BG08-SW-SW02S		BG08-SW-SW01		BG08-SW-SW02		BG08-SW-SW02S	
Date Sampled :		8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/29/2008	
Time Sampled :		12:51		15:40		15:40		12:51		15:40		15:40	
Units:		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	403		630		622		319		478		531	
ANTIMONY	60							5.9	J				
ARSENIC	10												
BARIUM	200	30.0	J	37.9	J			33.3	J	40.6	J		
BERYLLIUM	5	0.59	J	0.55	J			0.52	J	0.50	J		
CADMIUM	5												
CALCIUM	5000	19300		24900		25900		18400		23300		24600	
CHROMIUM	10												
COBALT	50	5.6	J	9.2	J			4.8	J	8.2	J		
COPPER	25												
IRON	100	996		1140	B	422		665	B	254	B	265	
LEAD	10	4.8	J	1.4	J								
MAGNESIUM	5000	7250		8530		8940		6520		7510		8590	
MANGANESE	15	360		358		378		346		339		363	
MERCURY	0.2												
NICKEL	40	3.6	J	4.9	J	15.2	J	11.3	J	13.1	J	14.6	J
POTASSIUM	5000	2620	J	4680	J	4990	J	2700	J	4610	J	4740	J
SELENIUM	35												
SILVER	10												
SODIUM	5000	14600		23400		25900		15700		24400		24700	
THALLIUM	25												
VANADIUM	50				UL								
ZINC	60	24.7	J	26.0	J	28.0	J	22.1	J	22.8	J	27.4	J
MOLYBDENUM	5				UL								
BORON	50	25.6	J	22.1	J	39.9	J	34.8	B	30.9	B	38.2	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

Table 2
ANALYTICAL RESULTS
SUBSURFACE SOIL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		MC02J7		MC02J8		MC02J9		MC02K0		MC02K1		MC02K2		MC02M1	
Sampling Location :		BG08-SS-MP01		BG08-SS-MP02		BG08-SS-MP03		BG08-SS-MP04		BG08-SS-MP05		BG08-SS-MP06		BG08-SS-MP06S	
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	
Time Sampled :		10:18		11:35		12:15		13:24		14:15		15:07		15:07	
Units:		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	20	26500		859		2690		1090		14000		1540		2060	
ANTIMONY	6														
ARSENIC	1	3.2		0.53	J	0.50	J	0.26	J	2.7		0.40	J	1.2	
BARIUM	20	80.5		3.4	J	11.3	J	2.8	J	46.9		11.6	J	13.8	J
BERYLLIUM	0.5	0.52	J	0.087	J	0.15	J			0.92		0.073	J		
CADMIUM	0.5											0.067	J		
CALCIUM	500	814		255	J	407	J	151	J	428	J	197	J	238	J
CHROMIUM	1	18.8		3.0		8.8		2.5		15.3		5.1		6.5	
COBALT	5	4.0	J	1.4	J	1.8	J	0.69	J	1.4	J	1.6	J		
COPPER	2.5	8.4		0.76	J	3.3		0.60	J	2.2	J	2.2	J	15.9	
IRON	10	4660		980		3040		565		11300		2320		2550	
LEAD	1	18.6		1.2	J	2.3		0.90	J	8.1		1.8		1.9	
MAGNESIUM	500	1290		178	J	780		118	J	572	J	371	J	538	J
MANGANESE	1.5	22.5		8.1		18.6		6.0		11.9		13.0		15.9	
MERCURY	0.1	0.054	J					0.095	J	0.12	J				
NICKEL	4	11.0		2.5	J	5.5		1.3	J	5.5		3.3	J	3.1	J
POTASSIUM	500	830				339	J			198	J	143	J	332	J
SELENIUM	3.5	1.1	J	0.61	J	0.54	J			1.2	J	0.42	J		
SILVER	1														
SODIUM	500	82.0	J	84.7	J	43.6	J			47.8	J	33.7	J		
THALLIUM	2.5														
VANADIUM	5	20.3		2.5	J	9.1		2.3	J	35.7		5.2	J	6.6	
ZINC	6	14.7		8.9		13.1		6.7	J	7.2	J	8.0		7.6	
MOLYBDENUM	0.5													0.88	
BORON	5	2.9	B	1.1	B	2.0	J	0.98	B	3.3	J	1.1	B		

Notes:

mg/kg = milligrams per kilogram

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

Table 2
ANALYTICAL RESULTS
SUBSURFACE SOIL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		MC02K3		MC02K4		MC02K5		MC02K6		MC02K7		MC02K8		MC02M3		MC02K9	
Sampling Location :		BG08-SS-MP07		BG08-SS-MP08		BG08-SS-MP09		BG08-SS-MP10		BG08-SS-MP11		BG08-SS-MP12		BG08-SS-MP12S		BG08-SS-MP13	
Date Sampled :		8/25/2008		8/25/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008	
Time Sampled :		15:57		17:10		08:01		08:35		09:36		10:20		10:20		11:10	
Units:		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg		mg/kg	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	20	15600		532		14200		11400		631		1010		1000		11800	
ANTIMONY	6																
ARSENIC	1	1.3				1.9		4.6		0.49	J					2.2	
BARIUM	20	218				60.4		57.0								30.6	
BERYLLIUM	0.5	0.59	J			0.38	J	0.50	J							0.42	J
CADMIUM	0.5																
CALCIUM	500	962		193	J	892		838		81.3	J	77.6	J			401	J
CHROMIUM	1	20.6		2.5		35.3		29.9		1.5		1.8		1.4		10.9	
COBALT	5	1.7	J			5.4	J	4.8	J	0.76	J					1.4	J
COPPER	2.5	3.2		0.72	J	10.5		12.9				0.62	J			2.8	J
IRON	10	7970		707		13000		19900		468		430		319		1780	
LEAD	1	8.4		0.92	J	4.6		6.6		0.50	J	0.64	J			6.8	
MAGNESIUM	500	776		145	J	2330		2290		61.1	J	91.4	J			449	J
MANGANESE	1.5	17.9		8.7		41.5		40.9		4.4		3.6		2.5		10.5	
MERCURY	0.1					0.066	J									0.098	J
NICKEL	4	9.4		1.4	J	12.7		12.2		1.2	J	1.1	J			4.5	J
POTASSIUM	500	246	J			1230		1000								232	J
SELENIUM	3.5	0.78	J	0.67	J	0.96	J	1.4	J	0.58	J	0.72	J			1.1	J
SILVER	1																
SODIUM	500	68.7	J			82.3	J	76.1	J								
THALLIUM	2.5																
VANADIUM	5	13.9		2.3	J	31.6		43.5		1.6	J	1.7	J			8.8	
ZINC	6	9.8		6.7	J	30.6		27.2		6.4	J	4.8	J			9.0	
MOLYBDENUM	0.5					0.60	J	1.5	J	0.28	J						
BORON	5	2.3	B			5.1	B	5.6	J	1.0	B	1.0	B			1.7	B

Notes:

mg/kg = milligrams per kilogram

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number : [REDACTED]			(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location : [REDACTED]			(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)(b) (6)	
Date Sampled :			8/25/2008		8/25/2008		8/26/2008		8/26/2008		8/25/2008		8/25/2008		8/25/2008	
Time Sampled :			09:27		09:59		16:45		16:45		10:43		10:40		11:24	
Units:			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS			21.5	J	22.7	J								
ANTIMONY	2	6			0.25	B	1.2	B								
ARSENIC	1	10	1.5		1.5		1.6		1.5		1.6		1.6		1.4	
BARIUM	10	2000	1.5	J	27.2		1.1	B	26.7		12.4		1.4	B	1.2	B
BERYLLIUM	1	4			0.11	B										
CADMIUM	1	5			0.11	J	0.16	J	0.12	B						
CALCIUM	5000	NS	25300		65500		62900		66100		67900		26300		26100	
CHROMIUM	2	NS	0.60	B	0.73	B	0.88	J	0.71	B	0.74	J	0.60	B	0.68	B
COBALT	1	NS			0.15	B	0.35	B	0.13	B	0.16	B				
COPPER	2	1300	33.1		1.3	J	2.7		1.4	J	2.5		1.4	J	16.5	
IRON	100	NS	156		615		12.6	J	631		1190		180		175	
LEAD	1	15	2.6		0.29	J	0.31	B	0.25	J	0.11	J	0.24	J	1.1	
MAGNESIUM	5000	NS	16400		42000		43500		44000		18300		12800		12800	
MANGANESE	1	NS	4.3		14.4		18.0		14.7		91.4		8.0		4.7	
MERCURY	0.2			UL		UL	0.4			UL		UL		UL		UL
NICKEL	1	NS	0.57	J	0.75	J	1.3		0.52	J	0.69	J	0.36	B	0.61	J
POTASSIUM	5000	NS	12800		23200		24400		24900		8760		9450		9480	
SELENIUM	5	50		UL		UL		UL	1.8	J		UL		UL		UL
SILVER	1	NS		UL	0.090	B	0.080	B	0.067	B		UL		UL		UL
SODIUM	5000	NS	145000	J	222000	J	247000	J	247000	J	69300	J	51800	J	51200	J
THALLIUM	1	2					0.14	J								
VANADIUM	5	NS	0.89	B	0.78	B	0.93	B	0.30	B	0.98	B	0.98	B	0.96	B
ZINC	2	NS	21.4		2.0	J	18.5		2.9		2.4		7.7		15.4	
MOLYBDENUM	5	NS														
BORON	50	NS	193		275		290		295		113		116		114	

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

[REDACTED] = Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :			(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :			(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)(b) (6)		(b) (6)	
Date Sampled :			8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	
Time Sampled :			11:31		13:28		13:36		14:16		15:15		16:23		19:19		19:19		20:15	
Units:			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS	20.7	J			23.7	J	93.6	J										
ANTIMONY	2	6							0.20	B										
ARSENIC	1	10	1.2	B	1.4		1.3	B	1.4		1.4		1.4		1.6		1.7		1.4	
BARIUM	10	2000	76.5		8.2	J	10.0	J	19.3		12.9		11.6		88.5		83.7		18.7	
BERYLLIUM	1	4	0.27	J																
CADMIUM	1	5							0.13	B	0.12	B								
CALCIUM	5000	NS	15600		39500		41700		71600		73900		42600		225000		223000		50700	
CHROMIUM	2	NS	1.1	J	0.63	B	0.65	B	1.0	J	0.59	B	0.62	B	0.91	J	0.61	B	0.56	B
COBALT	1	NS							0.13	B										
COPPER	2	1300	45.6		17.1		1.5	J	437		3.3		4.0		6.5		9.2		55.7	
IRON	100	NS	12900		1980		1760		2830		1420		6600		1660		1560		8060	
LEAD	1	15	2.5		1.0		0.15	J	67.1		0.15	J	0.40	J	0.30	J	0.42	J	4.9	
MAGNESIUM	5000	NS	6670		19300		19800		17200		18000		18400		12700		12700		23200	
MANGANESE	1	NS	230		186		107		156		99.5		256		246		236		281	
MERCURY	0.2	2		UL		UL		UL		UL		UL		UL		UL		UL		UL
NICKEL	1	NS	0.56	J	0.48	B	0.59	J	1.1		0.69	J	0.54	J	2.8		2.4		1.1	
POTASSIUM	5000	NS	2970	J	10500		11100		4810	J	7540		2530	J	4630	J	4500	J	2800	J
SELENIUM	5	50				UL		UL		UL		UL		UL		UL		UL		UL
SILVER	1	NS				UL		UL		UL	0.087	B	0.040	B		UL	UL	UL		UL
SODIUM	5000	NS	10100	J	68700	J	76700	J	49800	J	64400	J	32600	J	127000	J	125000	J	50300	J
THALLIUM	1	2																		
VANADIUM	5	NS	1.5	J	1.2	B	0.59	B	0.37	B	0.81	B	0.80	B	0.61	B	0.69	B	0.70	B
ZINC	2	NS	29.1		6.6		8.8		3090		8.3		10.2		4.0		3.9		60.2	
MOLYBDENUM	5	NS																		
BORON	50	NS	29.1	B	107		124		54.9		94.4		16.9	B	29.8	B	30.8	J	18.4	B

Notes:

µg/L = Micrograms per liter

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J = Analyte Present. Reported value may not be accurate or precise.

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UL = Not detected, quantitation limit is probably higher.

TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)			
Sampling Location :		(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)			
Date Sampled :		8/25/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008			
Time Sampled :		20:15		07:46		08:19		09:18		09:15		10:26		10:50		11:33			
Units:		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L			
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	
ALUMINUM	200	NS														UL		UL	
ANTIMONY	2	6													0.37	B	0.99	B	
ARSENIC	1	10	1.1		1.4		1.4		1.4		1.5		1.3		1.4	B	1.3	B	
BARIUM	10	2000	17.3		2.6	B	4.5	B	4.7	B	21.4		1.8	J	1.7	B	11.4		
BERYLLIUM	1	4															0.11	J	
CADMIUM	1	5																	
CALCIUM	5000	NS	51700		32000		37400		29400		64200		29500		28800		33000		
CHROMIUM	2	NS			0.46	B	0.45	B	0.61	B	0.49	B	0.49	B	0.81	J	1.4	J	
COBALT	1	NS													0.20	B	0.21	B	
COPPER	2	1300	14.7	J	1.7	J	15.9		8.1		95.6		0.60	J	2.6		246		
IRON	100	NS	8320		192		644		194		4390		133		161		5750		
LEAD	1	15	1.4		0.34	J	1.1		0.95	J	10.8				0.22	B	6.2		
MAGNESIUM	5000	NS	23900		28900		5050		27100		20200		13900		15400		16300		
MANGANESE	1	NS	243	J	4.4		62.1		9.7		219		6.0		5.5		231		
MERCURY	0.2	2						UL		UL		UL		UL					
NICKEL	1	NS		UL	0.32	B	0.37	B	0.49	B	1.2		0.34	J	0.74	B	1.2		
POTASSIUM	5000	NS	3260	J	20600		2660	J	19600		4300	J	8710		9000		1410	J	
SELENIUM	5	50			1.9	J		UL		UL		UL		UL		UL			
SILVER	1	NS		UL		UL		UL		UL		UL		UL		0.063	B	0.083	B
SODIUM	5000	NS	52300	J	340000	J	16600	J	238000	J	45500	J	65200	J	85100	J	32300	J	
THALLIUM	1	2															0.11	J	
VANADIUM	5	NS			0.98	B	0.80	B	0.49	B	1.0	B	0.78	B	1.2	B	1.1	B	
ZINC	2	NS	16.8	J	3.0		5.8		6.5		61.3		3.5		2.3		552		
MOLYBDENUM	5	NS																	
BORON	50	NS	28.5	J	363		26.6	B	284		44.2	J	115		146		19.7	J	

Notes:

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UL = Not detected, quantitation limit is probably higher.

TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		
Sampling Location :		(b) (6)		(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		
Date Sampled :		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		
Time Sampled :		11:26		11:26		13:16		17:18		17:50		17:50		18:51		18:59		
Units:		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS		UL		UL		UL		UL		UL		UL		UL		UL
ANTIMONY	2	6	0.21	J									0.21	B				
ARSENIC	1	10	1.4		1.6		1.5	B	1.7		1.4	B	1.3	B	1.3	B	1.4	B
BARIUM	10	2000	1.5	J	1.3	B	10.2		1.8	B	1.2	B	1.6	B	1.6	B	1.8	B
BERYLLIUM	1	4																
CADMIUM	1	5											0.11	B	0.15	B	0.11	B
CALCIUM	5000	NS	24000		24300		24300		30300		35700		35200		22800		23000	
CHROMIUM	2	NS	1.0	J	1.0	J	0.96	J	1.1	J	0.71	B	0.74	B	0.76	B	0.76	B
COBALT	1	NS	0.14	J	0.11	B			0.17	B			0.13	B				
COPPER	2	1300	8.4		63.3		24.4		123		32.6		21.6		1.2	J	11.0	
IRON	100	NS	148		164		6280		192		185		187		177		190	
LEAD	1	15	0.77	J	6.1		4.5		18.6		1.9		1.4		0.12	B	0.77	J
MAGNESIUM	5000	NS	14700		14700		5310		19100		6710		6730		16900		16900	
MANGANESE	1	NS	3.6		4.3		152		4.3		6.6		6.7		7.6		8.5	
MERCURY	0.2	2																
NICKEL	1	NS	0.63	J	1.2		0.58	B	1.3		0.63	J	0.65	B	0.45	B	0.51	B
POTASSIUM	5000	NS	9320		9270		1310	J	13600		3250	J	3190	B	12400		12000	
SELENIUM	5	50								UL		UL				UL		UL
SILVER	1	NS	0.040	J	0.037	B				UL		UL	0.10	B	0.037	B	0.040	B
SODIUM	5000	NS	75800	J	75900	J	9370	J	157000	J	30600	J	30600	J	59700	J	48300	J
THALLIUM	1	2																
VANADIUM	5	NS	1.0	J	1.3	B	0.88	B	1.5	J	0.69	B	1.2	B	0.71	B	0.78	B
ZINC	2	NS	12.0		54.1		7.2		41.4		10.1		8.7		2.2		9.0	
MOLYBDENUM	5	NS																
BORON	50	NS	144		146		26.4	J	207		51.4		56.7		131		122	

Notes:

µg/L = Micrograms per liter

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TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		(b) (6)	(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)	(b) (6)		(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Date Sampled :		8/26/2008	8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008	
Time Sampled :		19:13	09:18		10:40		10:56		10:19		11:24		11:56		12:24			
Units:		µg/L	µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS										UL		UL				
ANTIMONY	2	6													0.23	B		
ARSENIC	1	10	1.9		1.6		1.5	B	1.5		1.5	B	1.6		1.5		1.6	
BARIUM	10	2000	4.0	B	29.4		6.7	J	5.6	B	5.4	B	44.1		22.2		14.2	
BERYLLIUM	1	4																
CADMIUM	1	5									0.12	B	0.13	B	0.16	B	0.10	B
CALCIUM	5000	NS	37100		47100		52800		52300		48900		160000		118000		142000	
CHROMIUM	2	NS	0.96	J	0.88	B	0.83	B	0.87	B	0.79	B	1.5	J	0.99	J	1.1	J
COBALT	1	NS			0.11	B												
COPPER	2	1300	2.4		1.3	J	129		58.5		37.5		488		104		120	
IRON	100	NS	290		4800		763		835		804		623		521		174	
LEAD	1	15	0.21	B	0.20	B	7.1		4.6		12.0		7.4		7.7		8.7	
MAGNESIUM	5000	NS	45300		34600		2720	J	2700	B	2430	J	14900		8650		8130	
MANGANESE	1	NS	5.0		200		44.6		47.2		46.6		484		127		154	
MERCURY	0.2																	
NICKEL	1	NS	0.47	B	0.55	B	1.5		1.1		0.85	B	5.5		1.8		138	
POTASSIUM	5000	NS	28900		10700								722	J	1170	J	868	J
SELENIUM	5	50	3.6	J		UL		UL		UL		UL		UL		UL		UL
SILVER	1	NS		UL		UL		UL		UL		UL		UL	0.097	B	0.063	B
SODIUM	5000	NS	633000	J	83700	J	8950	J	8720	J	8310	J	85600	J	19600	J	21800	J
THALLIUM	1	2																
VANADIUM	5	NS	0.56	B	0.86	B	0.60	J	1.6	J	0.95	B	1.7	J	1.1	B	1.0	B
ZINC	2	NS	3.4		3.5		82.0		44.7		14.4		375		101		223	
MOLYBDENUM	5	NS										UL		UL		UL		UL
BORON	50	NS	539		114		14.0	J	18.3	J	18.3	J	160		26.6	J	24.6	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		(b) (6)			(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)			(b) (6)		(b) (6)		(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)(b) (6)	
Date Sampled :		8/27/2008			8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/26/2008		8/27/2008		8/27/2008	
Time Sampled :		13:18			13:39		14:21		14:21		14:58		13:20		15:20		16:39	
Units:		µg/L			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS																
ANTIMONY	2	6					0.40	B	1.4	B	1.1	B			0.22	B		
ARSENIC	1	10	1.4	B	1.7		1.7		1.4		1.8		1.6		1.7		1.5	
BARIUM	10	2000	3.0	B	1.9	B	36.0		21.4		21.1		2.8	J	9.9	J	1.7	J
BERYLLIUM	1	4													0.10	J		
CADMIUM	1	5													0.10	B		
CALCIUM	5000	NS	64800		73800		135000		143000		146000		49500		82000		65200	
CHROMIUM	2	NS	0.93	J	0.83	B	1.1	J			1.4	J	0.74	J	0.75	J	0.64	J
COBALT	1	NS													1.1		0.11	J
COPPER	2	1300	95.2		51.3		5.7		182	J	88.9		12.7		17.5		10.3	
IRON	100	NS	626		685		830		992		565		350		7640		767	
LEAD	1	15	17.9		1.7		0.27	B	8.7		2.4		2.0		1.3		0.20	J
MAGNESIUM	5000	NS	3790	J	5030		9400		9990		9000		3420	J	11800		3160	J
MANGANESE	1	NS	9.2		5.3		165		155	J	169		11.1		232		6.9	
MERCURY	0.2	2								UL				UL		UL		
NICKEL	1	NS	1.0		0.90	B	2.4		2.6		0.80	J	1.7		0.68		0.68	J
POTASSIUM	5000	NS	1600	J	3010	J	636	J	2480	J	2810	J	1490	J	2910	J	2910	J
SELENIUM	5	50		UL		UL												
SILVER	1	NS		UL		UL	0.037	B		UL	0.083	B		UL	0.097	B	0.043	J
SODIUM	5000	NS	17000	J	52900	J	22500	J	24300	J	63800	J	34500	J	30200	J	21200	J
THALLIUM	1	2							0.12	B								
VANADIUM	5	NS	1.2	B	1.7	J	1.0	B	1.1	B	1.3	B	1.2	B	1.2	B	1.2	J
ZINC	2	NS	17.3		11.7		61.7		81.6	J	24.6		12.4		13.8		2.6	
MOLYBDENUM	5	NS		UL		UL		UL		UL		UL						
BORON	50	NS	45.7	J	111	J	20.1	J	30.1	J	95.4	J	46.8	J	11.7	J	46.5	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		
Sampling Location :		(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		
Date Sampled :		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/25/2008		8/29/2008		
Time Sampled :		17:07		17:15		18:18		19:30		19:20		19:15		19:15		10:12		
Units:		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS																
ANTIMONY	2	6																
ARSENIC	1	10	1.3		1.3		1.4		1.5		1.4		1.4		1.3		1.5	
BARIUM	10	2000	9.3	J	1.6	J	1.9	J	5.6	J	1.7	J	1.4	J	1.5	J	1.1	J
BERYLLIUM	1	4																
CADMIUM	1	5	0.10	B					0.26	J			0.10	B				
CALCIUM	5000	NS	4840	J	65200		26800		52200		45200		43400		47000		27100	
CHROMIUM	2	NS	0.74	J	0.67	J	0.64	J	0.72	J	1.1	J	0.57	J	0.52	B	0.57	J
COBALT	1	NS	0.33	J							0.12	J						
COPPER	2	1300	76.0		10.1		6.4		80.5		2.1		97.1		9.3		22.5	
IRON	100	NS	5850		550		150		349		305		322		343		157	
LEAD	1	15	6.0		0.54	J	2.0		6.3		0.22	J	18.9		0.49	J	1.9	
MAGNESIUM	5000	NS	1400	J	3010	J	20000		4140	J	3620	J	4330	J	3590	J	14600	
MANGANESE	1	NS	112		5.9		8.4		11.1		10.2		9.4		9.4		4.3	
MERCURY	0.2	2		UL		UL		UL		UL		UL		UL		UL		UL
NICKEL	1	NS	0.47	J	0.78	J	0.89	J	1.7		0.55	J	1.1		0.54	J	0.67	J
POTASSIUM	5000	NS	599	J	2310	J	15600		3980	J	3180	J	3710	J	3140	J	10400	
SELENIUM	5	50		UL		UL		UL		UL		UL		UL				
SILVER	1	NS							0.040	B						UL		UL
SODIUM	5000	NS	6920	J	15600	J	133000	J	62000	J	36100	J	43600	J	41000	J	86400	J
THALLIUM	1	2																
VANADIUM	5	NS	1.5	B	1.1	B	0.63	B	1.2	B	1.3	J	1.1	B	0.90	J	0.69	B
ZINC	2	NS	42.3		3.4		7.3		71.5		3.3		66.5		11.6		28.1	
MOLYBDENUM	5	NS														UL		
BORON	50	NS		UL	31.5	J	150		41.6	J	12.4	J	18.9	J	14.5	J	108	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

**TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES**

*Battlefield Golf Fly Ash Assessment
Sampled August, 2008*

Sample Number :		(b) (6)			(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)			(b) (6)		(b) (6)		(b) (6)		(b) (6)(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Date Sampled :		8/29/2008			8/28/2008		8/28/2008		8/26/2008		8/26/2008		8/27/2008		8/27/2008		8/28/2008	
Time Sampled :		10:12			17:47		09:17		10:13		10:13		15:41		16:13		09:45	
Units:		µg/L			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS							17.9	J	545							
ANTIMONY	2	6																
ARSENIC	1	10	1.0		1.6		1.4		2.6		2.4		1.5		1.5		1.6	
BARIUM	10	2000			1.7	J	15.0		59.0		58.3		33.0		0.50	J	47.8	
BERYLLIUM	1	4							0.51	J	0.42	J						
CADMIUM	1	5					0.12	B	0.16	B								
CALCIUM	5000	NS	26900		30200		89300				18700		66300		1600	J	96100	
CHROMIUM	2	NS			0.65	J	0.52	B	0.99	J			0.69	J	0.75	J	0.63	J
COBALT	1	NS			0.12	J			8.7		7.9				0.11	J		
COPPER	2	1300	226	J	39.5		87.9		55.3		15.6	J	15.6		148		16.4	
IRON	100	NS	155		240		1150				2800		4930		40.1	J	950	
LEAD	1	15	30.2		2.2		7.2		12.2		10.0		0.67	J	11.8		1.0	
MAGNESIUM	5000	NS	14900		16400		4960	J			3350	J	26600				10200	
MANGANESE	1	NS	3.7	J	4.4		144		102		101	J	178		2.4		238	
MERCURY	0.2	2		UL		UL		UL		UL		UL		UL		UL		
NICKEL	1	NS	2.3		0.62	J	1.3		8.0		6.4		0.66	J	0.82	J	2.2	
POTASSIUM	5000	NS	10900		13100		857	J			2120	J	8320		1000	J	3110	J
SELENIUM	5	50				UL		UL						UL		UL		
SILVER	1	NS		UL	0.087	B	0.043	B		UL		UL		UL		UL		
SODIUM	5000	NS	83600	J	153000	J	8980	J		UL	54900	J	73600	J	327000	J	52900	J
THALLIUM	1	2																
VANADIUM	5	NS			1.0	J	1.2	B	2.4	J			0.76	B	0.75	B	0.87	J
ZINC	2	NS	365	J	30.2		73.2		40.0		27.7	J	18.4		16.9		8.4	
MOLYBDENUM	5	NS		UL		UL		UL		UL		UL		UL		UL		
BORON	50	NS	174	K	145	J				UL	33.6	J	32.3	J		UL	321	

Notes:

µg/L = Micrograms per liter

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UL = Not detected, quantitation limit is probably higher.

TABLE 3
ANALYTICAL RESULTS
RESIDENTIALWELL SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number			(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)
Sampling Location			(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)
Date Sampled :			8/28/2008	8/28/2008	8/29/2008	8/29/2008	8/29/2008	8/29/2008	8/29/2008	8/29/2008	8/29/2008	8/29/2008	8/28/2008	8/28/2008	8/28/2008
Time Sampled :			10:23	10:29	11:19	11:19	11:19	11:19	11:19	11:30	11:30	11:30	11:13	11:13	11:13
Units:			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result
ALUMINUM	200	NS													
ANTIMONY	2	6			0.44	B	1.2	J	0.23	B	0.22	B			
ARSENIC	1	10	1.6		1.6		1.4		1.6		1.5		1.4	B	
BARIUM	10	2000	30.9		27.9		77.9		77.0		84.1		14.0		
BERYLLIUM	1	4									0.11	J			
CADMIUM	1	5			0.16	J	0.13	J							
CALCIUM	5000	NS	103000		116000		43100		44000		33400		37800		
CHROMIUM	2	NS	0.71	J	0.76	B	0.82	J	0.74	B	0.90	J	1.9	J	
COBALT	1	NS					0.14	B					0.14	B	
COPPER	2	1300	24.3		48.4		441		327		133		54.4		
IRON	100	NS	1140		778		1230		223		5740		17300		
LEAD	1	15	2.1		1.9		10.3		1.9		8.4		6.4		
MAGNESIUM	5000	NS	7910		8380		11000		11000		9130		22600		
MANGANESE	1	NS	166		120		257		247		213		261		
MERCURY	0.2	2				UL		UL		UL		UL		UL	
NICKEL	1	NS	2.8		3.6		1.1		1.1		2.0		1.1		
POTASSIUM	5000	NS	2540	J	3490	J	6970		7190		3740	J	2260	J	
SELENIUM	5	50				UL		UL		UL		UL			
SILVER	1	NS			0.070	B	0.067	B	0.050	B	0.047	B	0.040	B	
SODIUM	5000	NS	44300	J	42200	J	51100	J	52800	J	113000	J	64700	J	
THALLIUM	1	2					0.11	B							
VANADIUM	5	NS	1.2	J	1.4	J	0.64	B	0.99	B	1.3	J	1.2	J	
ZINC	2	NS	38.7		31.2		17.4		16.8		140		1360		
MOLYBDENUM	5	NS													
BORON	50	NS	596		380		108		107		137		4.4	J	

Notes:

µg/L = Micrograms per liter

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J = Analyte Present. Reported value may not be accurate or precise.

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UL = Not detected, quantitation limit is probably higher.

TABLE 4
ANALYTICAL RESULTS
ON SITE GROUNDWATER SAMPLES - TOTAL METALS

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :			MC02A1		MC02A2		MC02A3		MC02L2		MC02A4		MC02A5		MC02A6		MC02A7	
Sampling Location :			BG08-GW-MP01		BG08-GW-MP02		BG08-GW-MP03		BG08-GW-MP03S		BG08-GW-MP04		BG08-GW-MP05		BG08-GW-MP06		BG08-GW-MP07	
Date Sampled :			8/28/2008		8/29/2008		8/29/2008		8/29/2008		8/28/2008		8/28/2008		8/28/2008		8/28/2008	
Time Sampled :			12:40		11:15		10:00		10:00		14:06		15:50		17:47		18:10	
Units:			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS	100	J	1460		202		957		177	J	1060		1030		423	
ANTIMONY	60	6																
ARSENIC	10	10			10.7						2.6	J	4.6	J	3.5	J	19.8	
BARIUM	200	2000	34.9	J	48.1	J	22.9	J			79.4	J	83.4	J	85.7	J	33.7	J
BERYLLIUM	5	4																
CADMIUM	5	5																
CALCIUM	5000	NS	27500		32300		65700		63500		20000		41000		59300		62900	
CHROMIUM	10	NS	1.1	J	11.1		3.5	J	5.3	J	2.1	J	4.3	J	8.9	J	3.3	J
COBALT	50	NS			12.1	J	5.2	J									47.2	J
COPPER	25	1300			2.4	J												
IRON	100	NS	8060		13100		11700		12800		9590		12900		16300		38400	
LEAD	10	15	1.7	J	11.8		8.9	J			2.8	J	6.1	J	17.3		28.3	
MAGNESIUM	5000	NS	5750		12300		34600		34200		3720	J	9190		37500		17100	
MANGANESE	15	NS	149		204		135		151		160		272		224		348	
MERCURY	0.2	2			0.073	J												
NICKEL	40	NS			10.2	J	5.7	J									61.0	
POTASSIUM	5000	NS	5770		2430	J	4880	J	5220		4440	J	6180		3210	J	1710	J
SELENIUM	35	50																
SILVER	10	NS																
SODIUM	5000	NS	18600		12500		21600		22400		8950		12300		26900		8080	
THALLIUM	25	2																
VANADIUM	50	NS			4.0	J												
ZINC	60	NS	6.2	B	60.6		9.8	B			12.8	J	6.4	B	14.3	J	326	
MOLYBDENUM	5	NS		UL		UL		UL		UL		UL		UL		UL		UL
BORON	50	NS	15.2	J	5.6	J	9.9	J	25.1	J	7.4	J	14.9	J		UL	22.7	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte Present. Reported value may be biased high. Actual value is expected to be lower.

 = Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 4
ANALYTICAL RESULTS
ON SITE GROUNDWATER SAMPLES - TOTAL METALS

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :			MC02A8		MC02L3		MC02A9		MC02B0		MC02B1		MC02B2		MC02B3		MC02B4	
Sampling Location :			BG08-GW-MP08		BG08-GW-MP08S		BG08-GW-MP09		BG08-GW-MP10		BG08-GW-MP11		BG08-GW-MP12		BG08-GW-MP13		BG08-GW-MW01	
Date Sampled :			8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/28/2008		8/28/2008		8/28/2008		8/29/2008	
Time Sampled :			09:10		09:10		10:50		11:50		13:48		13:05		13:25		15:55	
Units:			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS	241		593		5570		5510		224		687		70.7	J	76.5	J
ANTIMONY	60	6																
ARSENIC	10	10	6.4	J			13.2		8.2	J	3.3	J					3.4	J
BARIUM	200	2000					74.0	J	99.6	J	103	J	41.4	J	70.0	J		
BERYLLIUM	5	4					0.43	J										
CADMIUM	5	5																
CALCIUM	5000	NS	48600		50600		22700		40400		19800		37100		31100		22400	
CHROMIUM	10	NS	1.2	J			29.3		85.2		2.8	J	4.6	J	0.96	J		
COBALT	50	NS	9.9	J			37.1	J	6.2	J							11.4	J
COPPER	25	1300					6.9	J	23.7	J								
IRON	100	NS	12800		13200		20900		23100		13700		7010		11900		4320	
LEAD	10	15	20.9				27.3		20.4				2.0	J	1.9	J	13.1	
MAGNESIUM	5000	NS	13700		14300		19100		12800		3980	J	5780		4300	J	14200	
MANGANESE	15	NS	143		163		211		206		127		243		211		126	
MERCURY	0.2	2																
NICKEL	40	NS	11.5	J	18.8	J	54.6		18.5	J							17.9	J
POTASSIUM	5000	NS	2790	J	3150	J	2520	J	2440	J	4620	J	8660		5950		1180	J
SELENIUM	35	50																
SILVER	10	NS																
SODIUM	5000	NS	11800		13500		19200		10900		11100		35300		18800		12200	
THALLIUM	25	2																
VANADIUM	50	NS					16.4	J	14.7	J								
ZINC	60	NS	89.8		102		244		29.1	J	5.2	B	4.2	B	7.1	B	70.8	
MOLYBDENUM	5	NS		UL		UL		UL	9.7			UL		UL		UL		UL
BORON	50	NS	39.1	J	54.1	K	13.6	J			19.0	J	52.5		24.7	J		

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte Present. Reported value may be biased high. Actual value is expected to be lower.

= Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 4
ANALYTICAL RESULTS
ON SITE GROUNDWATER SAMPLES - TOTAL METALS

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :			MC02B5		MC02B6		MC02B7		MC02L4	
Sampling Location :			BG08-GW-MW02		BG08-GW-MW02D		BG08-GW-MW03		BG08-GW-MW03S	
Date Sampled :			8/29/2008		8/29/2008		8/29/2008		8/29/2008	
Time Sampled :			13:50		13:50		14:50		14:50	
Units:			µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS	275		397		561		1350	
ANTIMONY	60	6								
ARSENIC	10	10	6.7	J	5.8	J	3.4	J		
BARIUM	200	2000								
BERYLLIUM	5	4								
CADMIUM	5	5								
CALCIUM	5000	NS	71400		72100		59500		62900	
CHROMIUM	10	NS	0.80	J	1.2	J	1.9	J		
COBALT	50	NS								
COPPER	25	1300								
IRON	100	NS	5160		5380		8030		8540	
LEAD	10	15	15.6		16.1		16.2			
MAGNESIUM	5000	NS	20300		20200		18800		19600	
MANGANESE	15	NS	120		123		184		197	
MERCURY	0.2	2								
NICKEL	40	NS								
POTASSIUM	5000	NS	1690	J	1810	J	2590	J	3020	J
SELENIUM	35	50								
SILVER	10	NS								
SODIUM	5000	NS	32400		32600		25000		26500	
THALLIUM	25	2				UL		UL		
VANADIUM	50	NS					2.8	J		
ZINC	60	NS	8.6	B	6.5	B	24.1	J		
MOLYBDENUM	5	NS		UL		UL		UL		UL
BORON	50	NS	29.4	J	27.5	J	17.4	J	29.4	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte Present. Reported value may be biased high. Actual value is expected to be lower.

= Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 5
ANALYTICAL RESULTS
ON SITE GROUNDWATER SAMPLES DISSOLVED METALS

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :			MC1GF1		MC1GF2		MC1GF3		MC1GH0		MC1GF4		MC1GF5		MC1GF6	
Sampling Location :			BG08-GW-MP01		BG08-GW-MP02		BG08-GW-MP03		BG08-GW-MP03S		BG08-GW-MP04		BG08-GW-MP05		BG08-GW-MP06	
Date Sampled :			8/28/2008		8/29/2008		8/29/2008		8/29/2008		8/28/2008		8/28/2008		8/28/2008	
Time Sampled :			12:40		11:15		10:00		10:00		14:06		15:50		17:47	
Units:			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS		B							23.6	J				
ANTIMONY	2	6	0.43	B	1.2	B	0.25	B			0.23	B	0.21	B	0.20	B
ARSENIC	1	10	1.3		6.6		2.5		1.2	K	3.2		2.3		2.7	
BARIUM	10	2000	35.7		40.2		23.9		21.2	K	81.0		79.5		84.6	
BERYLLIUM	1	4			0.11	B	0.13	J					0.20	J	0.19	J
CADMIUM	1	5	0.11	B	0.13	B							0.18	B		
CALCIUM	5000	NS	27800		30400		64000		65800		20700		42600		61200	
CHROMIUM	2	NS	0.73	B	1.5	J	1.7	J	1.7	J	1.2	J	1.2	J	2.4	
COBALT	1	NS	1.9		14.1		7.0		6.2	K	4.0		0.27	B	1.1	
COPPER	2	1300	0.69	J	0.55	B	0.39	B			0.37	B	0.43	B	0.39	B
IRON	100	NS	7430		7460		7440		6920		9790		11700		15700	
LEAD	1	15	0.26	B	0.26	B	0.25	B			0.12	B	0.16	B	0.20	B
MAGNESIUM	5000	NS	5880		11500		34700		35600		3860	J	9630		38000	
MANGANESE	1	NS	137		126		92.1		71.8	K	157		250		211	
MERCURY	0.2	2														
NICKEL	1	NS	5.0		15.5		10.4		7.8	K	5.8		0.83	J	2.8	
POTASSIUM	5000	NS	5780		1750	J	4270	J	4820	J	4420	J	6400		2940	J
SELENIUM	5	50		UL		UL		UL				UL		UL		UL
SILVER	1	NS	0.063	B	0.070	B		UL				UL	0.067	B	0.053	B
SODIUM	5000	NS	19500		12100		21900		23200		9660		13400		28200	
THALLIUM	1	2	0.17	B	0.15	B										
VANADIUM	5	NS	0.69	B	1.4	J	1.0	B			0.67	B	0.90	B	1.6	J
ZINC	2	NS	10.5		55.7		5.4		1.5	J	16.1		6.3		8.2	
MOLYBDENUM	5	NS	1.8	J												
BORON	50	NS	27.0	J	17.9	J	20.8	J	25.3	J	19.8	J	26.1	J	16.0	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte Present. Reported value may be biased high. Actual value is expected to be lower.

= Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 5
ANALYTICAL RESULTS
ON SITE GROUNDWATER SAMPLES DISSOLVED METALS

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :			MC1GF7		MC1GF8		MC1GH1		MC1GF9		MC1GG0		MC1GG1		MC1GG2	
Sampling Location :			BG08-GW-MP07		BG08-GW-MP08		BG08-GW-MP08S		BG08-GW-MP09		BG08-GW-MP10		BG08-GW-MP11		BG08-GW-MP12	
Date Sampled :			8/28/2008		8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/28/2008		8/28/2008	
Time Sampled :			18:10		09:10		09:10		10:50		11:50		13:48		13:05	
Units:			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS	48.3	J	73.5	J			95.3	J			84.1	J		
ANTIMONY	2	6	0.21	B												
ARSENIC	1	10	21.0		4.3		2.7	K	7.2		3.0		4.3		1.2	
BARIUM	10	2000	40.1		18.7		17.7	K	46.2		50.7		105		39.0	B
BERYLLIUM	1	4	0.58	B	0.27	J			0.40	J	0.18	J	0.20	J		
CADMIUM	1	5			0.13	B										
CALCIUM	5000	NS	66700		49200		47600		22000		39100		19900		36200	
CHROMIUM	2	NS	1.8	J	1.0	B			1.4	J	1.4	J	2.1		0.68	B
COBALT	1	NS	50.4		12.1		10.2	K	24.3		2.9		0.48	B	1.6	
COPPER	2	1300	0.34	B	0.62	J			0.35	B	0.40	B	0.30	B	0.55	B
IRON	100	NS	39300		12700		12400		8500		6190		13100		5490	
LEAD	1	15	0.12	B	0.15	B			0.10	B	0.10	B				
MAGNESIUM	5000	NS	18200		13800		13600		18500		11900		4130	J	5700	
MANGANESE	1	NS	334		134		111	K	121		102		126		206	
MERCURY	0.2	2														
NICKEL	1	NS	69.5		17.5		12.8	K	35.4		5.4		0.66	B	2.3	
POTASSIUM	5000	NS	1570	J	2540	J	2830	J	1430	J	1030	J	4490	J	8180	
SELENIUM	5	50		UL		UL				UL		UL		UL		UL
SILVER	1	NS	0.037	B		UL				UL		UL		UL		UL
SODIUM	5000	NS	8730		12200		12700		19200		10700		12000		35600	
THALLIUM	1	2														
VANADIUM	5	NS	1.9	J	1.6	J			2.2	J	1.4	J	3.6	J	1.1	B
ZINC	2	NS	330		103		91.8	K	174		4.1		8.5		5.0	
MOLYBDENUM	5	NS													1.4	J
BORON	50	NS	38.7	J	48.8	J	49.7	J	20.3	J	6.8	J	35.1	J	64.0	

Notes:

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= Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 5
ANALYTICAL RESULTS
ON SITE GROUNDWATER SAMPLES DISSOLVED METALS

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :			MC1GG3		MC1GG4		MC1GG5		MC1GG6		MC1GG7		MC1GH2	
Sampling Location :			BG08-GW-MP13		BG08-GW-MW01		BG08-GW-MW02		BG08-GW-MW02D		BG08-GW-MW03		BG08-GW-MW03S	
Date Sampled :			8/28/2008		8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/29/2008	
Time Sampled :			13:25		15:55		13:50		13:50		14:50		14:50	
Units:			µg/L		µg/L		µg/L		µg/L		µg/L		µg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS			28.8	J								
ANTIMONY	2	6					0.23	B						
ARSENIC	1	10	2.3		2.7		6.6		7.0		3.0		1.6	K
BARIUM	10	2000	72.3		20.4		18.3		19.0		18.1		17.1	K
BERYLLIUM	1	4			0.18	J	0.11	J	0.11	J				
CADMIUM	1	5					0.14	J						
CALCIUM	5000	NS	32800		22600		65600		69600		56000		57300	
CHROMIUM	2	NS	1.4	J	0.85	B	1.8	J	0.92	B	0.78	B	0.71	J
COBALT	1	NS	3.6		12.3		3.0		3.3		3.1		2.3	K
COPPER	2	1300	0.52	B	0.29	B	0.66	J	3.4		0.37	B		
IRON	100	NS	12700		4360		4660		4820		6970		6980	
LEAD	1	15			0.52	B	0.27	B	1.2		0.14	B		
MAGNESIUM	5000	NS	4570	J	14600		19300		20500		18100		18400	
MANGANESE	1	NS	212		121		107		108		163		146	K
MERCURY	0.2	2												
NICKEL	1	NS	2.1		22.0		7.8		7.9		5.7		3.1	K
POTASSIUM	5000	NS	5990		997	J	1460	J	1460	J	2120	J	2620	J
SELENIUM	5	50		UL		UL		UL		UL		UL		
SILVER	1	NS		UL		UL	0.12	B	0.067	J	0.043	J		
SODIUM	5000	NS	20900		12800		30200		31800		23600		24600	
THALLIUM	1	2												
VANADIUM	5	NS	0.89	B	1.2	B	1.1	B	1.1	B	1.1	B		
ZINC	2	NS	12.8		74.9		6.8		11.4		15.6		10.9	K
MOLYBDENUM	5	NS												
BORON	50	NS	43.1	J	10.3	J	28.6	J	29.0	J	22.4	J	26.1	J

Notes:

µg/L = Micrograms per liter

CRQL = contract required quantitation limit

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte Present. Reported value may be biased high. Actual value is expected to be lower.

= Shaded cell indicates compound reported above MCL

UL = Not detected, quantitation limit is probably higher.

TABLE 6
ANALYTICAL RESULTS
RINSATE BLANK SAMPLES

Battlefield Golf Fly Ash Assessment
Sampled August, 2008

Sample Number :		MC02L0		MC02L1	
Sampling Location :		BG08-RB01		BG08-RB02	
Date Sampled :		8/26/2008		8/26/2008	
Time Sampled :		10:15		10:15	
Units:		µg/L		µg/L	
ANALYTE	CRQL	Result	Flag	Result	Flag
ALUMINUM	200				
ANTIMONY	60				
ARSENIC	10				
BARIUM	200				
BERYLLIUM	5				
CADMIUM	5				
CALCIUM	5000	376	J	527	J
CHROMIUM	10				
COBALT	50				
COPPER	25				
IRON	100	124		571	
LEAD	10				
MAGNESIUM	5000			116	J
MANGANESE	15	2.4	J	8.0	J
MERCURY	0.2				
NICKEL	40				
POTASSIUM	5000				
SELENIUM	35				
SILVER	10				
SODIUM	5000				
THALLIUM	25				
VANADIUM	50				
ZINC	60	1.9	J	2.1	J
MOLYBDENUM	5				
BORON	50				

Notes:

µg/L = Micrograms per liter

CRQL = Contract Required Quantitation Limit

J = Analyte Present. Reported value may not be accurate or precise.

APPENDIX D
ANALYTICAL DATA REPORTS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : September 30, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Gulf Club site (Case # 37813 SDG #MC02C2) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TETRA TECH EMI)

TO File #: 0014

TDF#: 0977



Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

DATE: September 29, 2008

SUBJECT: Level IM2 Inorganic Data Validation for Case 37813
SDG: MC02C2
Site: Battlefield Golf Club

FROM: (b) (4) (b) (4)
Inorganic Data Reviewer

Through: (b) (4)(b) (4)(b) (4)
Senior Data Review Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02C2, consisted of twenty (20) aqueous samples analyzed for total metals by the ICP-MS method. The sample set included one (1) field duplicate pair. All samples were submitted to ChemTech Consulting Group (CHEM) for analyses. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Inorganic Data Review, level IM2. Areas of concern with respect to data usability are listed below.

Data in this Case have been impacted by outliers present in the laboratory blank as well as matrix spike analysis. Details for these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

CCBs had negative values greater than the absolute value of the MDL for selenium (Se). Quantitation limits for this analyte in affected samples may be biased low and have been qualified "UL" on the DSFs.

Preparation (PB) and Continuing Calibration (CCB) Blanks had reported results greater than the Method Detection Limits (MDLs) for the analytes listed below. Positive results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) the blank concentrations may be biased high and have been qualified "B" on the DSFs.

<u>Blank</u>	<u>Affected Analytes</u>
PB	barium (Ba), cobalt (Co), nickel (Ni)
CCB	antimony (Sb), arsenic (As), cadmium (Cd), chromium (Cr), lead (Pb), silver (Ag), vanadium (V)

The matrix spike recovery was low ($<75\%$ but $>30\%$) for silver (Ag). The low recovery may be attributed to matrix interferences or analyte lost during the digestion process. Positive results reported for this analyte in affected samples may be biased low. The "L" qualifier for this outlier has been superseded by "B" on the DSFs. Quantitation limits for this analyte in affected samples in this SDG may be biased low and have been qualified "UL" on the DSFs.

NOTES

Positive results which are less than the Contract Required Quantitation Limits (CRQLs) but greater than MDLs have been qualified "J" on the DSFs unless superseded by "B".

The post digestion spike recovery was high ($>125\%$) for Ag. No data were qualified based on this outlier.

Reported results for field duplicate pair MC02D4/MC02D5 were within control limits (20% RPD, \pm CRQL) for all analytes.

The Laboratory Chain-of-Custody (COC) records requested analyses for boron (B) and molybdenum (Mo). These analytes were analyzed in SDG MC02C1.

Data for Case 37813, SDG MC02C2, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses, April 1993.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

TABLES 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLES 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORM(S)
APPENDIX C	CHAIN OF CUSTODY RECORD(S)
APPENDIX D	LABORATORY CASE NARRATIVE(S)
DCN: 37813_ MC02C2. IM2	

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02C2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	MC02C1, MC02C2	B		High	CCB (0.383 J ug/L)
	MC02D2	B		High	CCB (0.267 J ug/L)
As	MC02C8, MC02D0	B		High	CCB (0.260 J ug/L)
	MC02E1	B		High	CCB (0.270 J ug/L)
Ba	MC02C2, MC02C6, MC02C7, MC02D7, MC02D8, MC02D9, MC02E1	B		High	PB (1.057 J ug/L)
Cd	MC02C1, MC02C2, MC02C3	B		High	CCB (0.183 J ug/L)
	MC02D2, MC02D3	B		High	CCB (0.197 J ug/L)
Cr	MC02C1, MC02C3, MC02C6, MC02C7, MC02C9, MC02D0	B		High	CCB (0.147 J ug/L)
	MC02D2, MC02D3, MC02D5, MC02D6, MC02D7, MC02D8, MC02D9, MC02E0, MC02E1	B		High	CCB (0.130 J ug/L)
Co	MC02C1, MC02C2, MC02C3, MC02C5, MC02D2	B		High	PB (0.160 J ug/L)
Pb	MC02C2	B		High	CCB (0.123 J ug/L)
Ni	MC02C6, MC02C9, MC02D7, MC02D8, MC02D9, MC02E1	B		High	PB (0.100 J ug/L)

• See explanation of comments in Table 1B

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02C2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Se	MC02C1, MC02C2, MC02C5, MC02C6, MC02C7, MC02C8, MC02C9, MC02D0, MC02D1		UL	Low	CBN (– 0.407 J ug/L)
	MC02D2, MC02D3, MC02D4, MC02D5, MC02D6, MC02D8, MC02D9, MC02E0, MC02E1		UL	Low	CBN (– 0.513 J ug/L)
Ag	MC02C1, MC02C2, MC02C3	B		High	CCB (0.087 J ug/L) MSL (49%)
	MC02D2, MC02D3	B		High	CCB (0.073 J ug/L) MSL (49%)
	All Samples Except MC02C1, MC02C2, MC02C3, MC02D2, MC02D3		UL	Low	MSL (49%)
V	MC02C1, MC02C2, MC02C3, MC02C5, MC02C6, MC02C7, MC02C9, MC02D0, MC02D1	B		High	CCB (0.240 J ug/L)
	MC02D2, MC02D3, MC02D4, MC02D5, MC02D6, MC02D7, MC02D8, MC02D9, MC02E0, MC02E1	B		High	CCB (0.263 J ug/L)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CCB	=	Continuing calibration blanks had reported results greater than the MDLs [results are in parenthesis]. Reported results which are less than or equal to five times ($\leq 5X$) the blank concentration may be biased high.
PB	=	The preparation blank had reported results greater than the MDLs [results are in parenthesis]. Reported results which are less than or equal to five times ($\leq 5X$) the blank concentration may be biased high.
CBN	=	Continuing calibration blanks had reported negative results greater than absolute value of MDL [results are in parenthesis]. Quantitation limits may be biased low.
MSL	=	The matrix spike recovery was low ($>30\%$ but $< 75\%$) [the %recovery is in parenthesis]. Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODE

Q = No analytical result.

Appendix B

Data Summary Forms (DSFs)

DATA SUMMARY FORM: INORGANIC

Page 1 of 4

Case #: 37813

SDG : (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 20

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Field QC :											
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/25/2008		8/26/2008		8/26/2008		8/25/2008		8/25/2008	
Time Sampled :		09:59		16:45		16:45		10:43		10:40	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	0.25	B	1.2	B						
*ARSENIC	1	1.5		1.6		1.5		1.6		1.6	
BARIUM	10	27.2		1.1	B	26.7		12.4		1.4	B
BERYLLIUM	1	0.11	J								
*CADMIUM	1	0.11	B	0.16	B	0.12	B				
*CHROMIUM	2	0.73	B	0.88	J	0.71	B	0.74	J	0.60	B
COBALT	1	0.15	B	0.35	B	0.13	B	0.16	B		
COPPER	2	1.3	J	2.7		1.4	J	2.5		1.4	J
*LEAD	1	0.29	J	0.31	B	0.25	J	0.11	J	0.24	J
MANGANESE	1	14.4		18.0		14.7		91.4		8.0	
*NICKEL	1	0.75	J	1.3		0.52	J	0.69	J	0.36	B
SELENIUM	5		UL		UL	1.8	J		UL		UL
SILVER	1	0.090	B	0.080	B	0.067	B		UL		UL
THALLIUM	1			0.14	J						
VANADIUM	5	0.78	B	0.93	B	0.30	B	0.98	B	0.98	B
ZINC	2	2.0	J	18.5		2.9		2.4		7.7	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 4

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Field QC :											
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	
Time Sampled :		11:24		11:31		13:28		13:36		14:16	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.4		1.2	B	1.4		1.3	B	1.4	
BARIUM	10	1.2	B	76.5		8.2	J	10.0	J	19.3	
BERYLLIUM	1			0.27	J						
*CADMIUM	1										
*CHROMIUM	2	0.68	B	1.1	J	0.63	B	0.65	B	1.0	J
COBALT	1										
COPPER	2	16.5		45.6		17.1		1.5	J	437	
*LEAD	1	1.1		2.5		1.0		0.15	J	67.1	
MANGANESE	1	4.7		230		186		107		156	
*NICKEL	1	0.61	J	0.56	J	0.48	B	0.59	J	1.1	
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL		UL		UL		UL		UL
THALLIUM	1										
VANADIUM	5	0.96	B	1.5	J	1.2	B	0.59	B	0.37	B
ZINC	2	15.4		29.1		6.6		8.8		3090	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 3 of 4

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Field QC :						(b) (6)(b) (6)		(b) (6)(b) (6)			
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	
Time Sampled :		15:15		16:23		19:19		19:19		20:15	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	0.20	B								
*ARSENIC	1	1.4		1.4		1.6		1.7		1.4	
BARIUM	10	12.9		11.6		88.5		83.7		18.7	
BERYLLIUM	1										
*CADMIUM	1	0.13	B	0.12	B						
*CHROMIUM	2	0.59	B	0.62	B	0.91	J	0.61	B	0.56	B
COBALT	1	0.13	B								
COPPER	2	3.3		4.0		6.5		9.2		55.7	
*LEAD	1	0.15	J	0.40	J	0.30	J	0.42	J	4.9	
MANGANESE	1	99.5		256		246		236		281	
*NICKEL	1	0.69	J	0.54	J	2.8		2.4		1.1	
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1	0.087	B	0.040	B		UL		UL		UL
THALLIUM	1										
VANADIUM	5	0.81	B	0.80	B	0.61	B	0.69	B	0.70	B
ZINC	2	8.3		10.2		4.0		3.9		60.2	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 4 of 4

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Field QC :											
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008	
Time Sampled :		07:46		08:19		09:18		09:15		10:26	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.4		1.4		1.4		1.5		1.3	B
BARIUM	10	2.6	B	4.5	B	4.7	B	21.4		1.8	B
BERYLLIUM	1										
*CADMIUM	1										
*CHROMIUM	2	0.46	B	0.45	B	0.61	B	0.49	B	0.49	B
COBALT	1										
COPPER	2	1.7	J	15.9		8.1		95.6		0.60	J
*LEAD	1	0.34	J	1.1		0.95	J	10.8			
MANGANESE	1	4.4		62.1		9.7		219		6.0	
*NICKEL	1	0.32	B	0.37	B	0.49	B	1.2		0.34	B
SELENIUM	5	1.9	J		UL		UL		UL		UL
SILVER	1		UL		UL		UL		UL		UL
THALLIUM	1										
VANADIUM	5	0.98	B	0.80	B	0.49	B	1.0	B	0.78	B
ZINC	2	3.0		5.8		6.5		61.3		3.5	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature:	<i>Erik Armistead</i>		
Project Code:	CT4354	Carrier Name:	FedEx		Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942977974.		1			
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900		2.			
Spill ID:	ALM				3.			
Site Name/State:	Battlefield Golf/VA			4.				
Project Leader:	Erik Armistead							
Action:	Preliminary Assessment							
Sampling Co:	Tetra Tech EM Inc.							

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02B2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 902 (HNO3) (2)	BG08-GW-MP12	S: 8/28/2008	13:05		--
MC02B3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 903 (HNO3) (2)	BG08-GW-MP13	S: 8/28/2008	13:25		--
MC02B4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 904 (HNO3) (2)	BG08-GW-MW01	S: 8/29/2008	15:55		--
MC02B5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 905 (HNO3) (2)	BG08-GW-MW02	S: 8/29/2008	13:50		--
MC02B6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 906 (HNO3) (2)	BG08-GW-MW02D	S: 8/29/2008	13:50		--
MC02B7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 907 (HNO3) (2)	BG08-GW-MW03	S: 8/29/2008	14:50		--
MC02B8	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 908 (HNO3) (2)	BG08-SW-SW01	S: 8/29/2008	12:51		--
MC02B9	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 909 (HNO3) (2)	BG08-SW-SW02	S: 8/29/2008	15:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	796 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:27		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:59 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	798 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	16:45 ✓		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)



R

15

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	799 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	16:45 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	801 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	10:43 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	802 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	10:40 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	803 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	11:24 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	804 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	11:31 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	805 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	13:28 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	806 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	13:36 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	807 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	14:16 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	808 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	15:15 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	809 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	16:23 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	810 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	19:19 ✓		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)

F2V5.1.047 Page 3 of 10



37814 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Sampler Signature: <i>Erik Armistead</i> Received By (Date / Time)
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)	
Spill ID:	ALM		284 Sheffield Street	
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092 (908) 789-8900	
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	811 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	19:19 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	812 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	813 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	7:46 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	814 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	8:19 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	815 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:18 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	816 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:15 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	817 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:26 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	818 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:50		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	819 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:33		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	820 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	821 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
		Date Approved: 8/20/2008	
EPA Project Leader: CHRIS WAGNER	Phone#:	Cell Phone #: 804-337-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOSHUA COPE	Phone#: 610-364-2130	Cell Phone #: 215-768-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK ARMISTEAD	Phone#: 610-364-2151	Cell Phone #: 267 446 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: _____ SDG No.: MC02C2SOW No.: ILM05.4

EPA Sample No.	Lab Sample ID
<u>MC02C1</u>	<u>Z4424-02</u>
<u>MC02C2</u>	<u>Z4424-01</u>
<u>MC02C3</u>	<u>Z4424-03</u>
<u>MC02C5</u>	<u>Z4424-04</u>
<u>MC02C6</u>	<u>Z4424-05</u>
<u>MC02C7</u>	<u>Z4424-06</u>
<u>MC02C8</u>	<u>Z4424-07</u>
<u>MC02C9</u>	<u>Z4424-08</u>
<u>MC02D0</u>	<u>Z4424-09</u>
<u>MC02D1</u>	<u>Z4424-10</u>
<u>MC02D2</u>	<u>Z4424-11</u>
<u>MC02D3</u>	<u>Z4424-12</u>
<u>MC02D4</u>	<u>Z4424-13</u>
<u>MC02D5</u>	<u>Z4424-14</u>
<u>MC02D6</u>	<u>Z4424-15</u>
<u>MC02D7</u>	<u>Z4424-16</u>
<u>MC02D8</u>	<u>Z4424-17</u>
<u>MC02D9</u>	<u>Z4424-18</u>
<u>MC02E0</u>	<u>Z4424-19</u>
<u>MC02E1</u>	<u>Z4424-20</u>
<u>MC02E1D</u>	<u>Z4424-21</u>
<u>MC02E1S</u>	<u>Z4424-22</u>

	ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No) _____	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No) _____	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No) _____	<u>NO</u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

(b) (4)

Name: (b) (4)(b) (4)

Date: _____

9/16/08

Title: (b) (4)(b) (4)(b) (4)(b) (4)

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

SDG NARRATIVE

USEPA
SDG # MC02C2
CASE # 37813
CONTRACT # EPW06047
LAB NAME: CHEMTECH CONSULTING GROUP
LAB CODE: CHEM
CHEMTECH PROJECT #Z4424

A. Number of Samples and Date of Receipt

20 Water Samples was delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for Metals CLP MS.

C. Cooler Temp

Indicator Bottle: Presence/Absence
Cooler: 4°C

D. Detail Documentation (related to Sample Handling Shipping, Analytical Problem, Temp of Cooler etc):

E. Corrective Action taken for above:

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-MS Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP-MS Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume and Final Volume made to 50 ml in ICP-MS Water Digestion procedure)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements except for the Silver. Duplicate sample did meet requirements. Serial Dilution did meet requirements.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature (b) (4)
Date 9/16/02

Name: (b) (4)(b) (4)

Title: (b) (4)(b) (4)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : September 30, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Gulf Club site (Case # 37813 SDG #MC1GF2) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TETRA TECH EMI)

TO File #: 0014

TDF#: 09-101

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

DATE: September 30, 2008

SUBJECT: Level IM2 Inorganic Data Validation for Case 37813
SDG: MC1GF2
Site: Battlefield Golf Club

FROM: (b) (4) (b) (4)
Inorganic Data Reviewer

Through: (b) (4)(b) (4)(b) (4) (b) (4)
Senior Data Review Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC1GF2, consisted of seventeen (17) filtrate aqueous samples analyzed for dissolved metals by the ICP-MS method. The sample set included one (1) field duplicate pair. All samples were submitted to ChemTech Consulting Group (CHEM) for analyses. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Inorganic Data Review, level IM2. Areas of concern with respect to data usability are listed below.

Data in this Case have been impacted by outliers present in the laboratory blanks as well as matrix spike analysis. Details for these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Preparation (PB) and Continuing Calibration (CCB) Blanks had reported results greater than the Method Detection Limits (MDLs) for the analytes listed below. Positive results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) the blank concentrations may be biased high and have been qualified "B" on the DSFs.

<u>Blank</u>	<u>Affected Analytes</u>
PB	nickel (Ni), vanadium (V)
CCB	antimony (Sb), arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), lead (Pb), silver (Ag), thallium (Tl)

CCBs had negative values greater than the absolute value of the MDL for selenium (Se). Quantitation limits for this analyte in all samples may be biased low and have been qualified "UL" on the DSFs.

The matrix spike recovery was low ($<75\%$ but $>30\%$) for silver (Ag). The low recovery may be attributed to matrix interferences or analyte lost during the digestion process. Positive results reported for this analyte in affected samples may be biased low. The "L" qualifier has been superseded by "B" on the DSFs. Quantitation limits for this analyte in affected samples in this SDG may be biased low and have been qualified "UL" on the DSFs.

NOTES

Positive results which are less than the Contract Required Quantitation Limits (CRQLs) but greater than MDLs have been qualified "J" on the DSFs unless superseded by "B".

The post digestion spike recovery was high ($>125\%$) for Ag. No data were qualified based on this outlier.

Reported results for field duplicate pair MC1GG5/MC1GG6 were within control limits (20% RPD, \pm CRQL) for all analytes except for Cu, Pb and zinc (Zn).

The following EPA sample numbers were designated for both total metals and dissolved metals on the chain-of-custody records. The Sample Management Office (SMO) assigned new sample numbers for the dissolved metal samples. The total metal samples retain the original sample numbers listed below.

<u>Original Sample Number</u>	<u>New Sample Member</u>
MC02A1	MC1GF1
MC02A2	MC1GF2
MC02A3	MC1GF3
MC02A4	MC1GF4

<u>Original Sample Number</u>	<u>New Sample Member</u>
MC02A5	MC1GF5
MC02A6	MC1GF6
MC02A7	MC1GF7
MC02A8	MC1GF8
MC02A9	MC1GF9
MC02B0	MC1GG0
MC02B1	MC1GG1
MC02B2	MC1GG2
MC02B3	MC1GG3
MC02B4	MC1GG4
MC02B5	MC1GG5
MC02B6	MC1GG6
MC02B7	MC1GG7

Data for Case 37813, SDG MC1GF2, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses, April 1993.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

TABLES 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLES 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORM(S)
APPENDIX C	CHAIN OF CUSTODY RECORD(S)
APPENDIX D	LABORATORY CASE NARRATIVE(S)

DCN: 37813_MC1GF2.IM2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC1GF2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	MC1GF1, MC1GF2, MC1GF3, MC1GF4, MC1GF5, MC1GF6, MC1GF7	B		High	CCB (0.333 J ug/L)
	MC1GG5	B		High	CCB (0.280 J ug/L)
As	MC1GF1, MC1GG2	B		High	CCB (0.293 J ug/L)
Cd	MC1GF1, MC1GF2, MC1GF5, MC1GF8	B		High	CCB (0.183 J ug/L)
Cr	MC1GF1, MC1GF8, MC1GG2, MC1GG4	B		High	CCB (0.220 J ug/L)
	MC1GG6, MC1GG7	B		High	CCB (0.187 J ug/L)
Co	MC1GF5, MC1GG1	B		High	CCB (0.10 J ug/L)
Cu	All Samples Except MC1GF1, MC1GF8, MC1GG5, MC1GG6, MC1GG7	B		High	CCB (0.107 J ug/L)
	MC1GG7	B		High	CCB (0.107 J ug/L)
Pb	MC1GF1, MC1GF2, MC1GF3, MC1GF4, MC1GF5, MC1GF6, MC1GF7, MC1GF8, MC1GF9, MC1GG0, MC1GG4	B		High	CCB (0.150 J ug/L)
	MC1GG5, MC1GG7	B		High	CCB (0.123 J ug/L)
Ni	MC1GG1	B		High	PB (0.137 J ug/L)

* See explanation of comments in Table 1B

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC1GF2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Se	MC1GF1, MC1GF2, MC1GF3, MC1GF4		UL	Low	CBN (- 0.220 J ug/L)
	All Samples Except MC1GF1, MC1GF2, MC1GF3, MC1GF4		UL	Low	CBN (- 0.517 J ug/L)
Ag	MC1GF1, MC1GF2, MC1GF5, MC1GF6, MC1GF7	B		High	CCB (0.117 J ug/L) MSL (49%)
	MC1GG5, MC1GG6, MC1GG7	B		High	CCB (0.177 J ug/L) MSL (49%)
	MC1GF3, MC1GF4, MC1GF8, MC1GF9, MC1GG0, MC1GG1, MC1GG2, MC1GG3, MC1GG4		UL	Low	MSL (49%)
Tl	MC1GF1, MC1GF2	B		High	CCB (0.117 J ug/L)
V	MC1GF1, MC1GF3, MC1GF4, MC1GF5, MC1GG2, MC1GG3, MC1GG4, MC1GG5, MC1GG6, MC1GG7	B		High	PB (0.236 J ug/L)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CCB	=	Continuing calibration blanks had reported results greater than the MDLs [results are in parenthesis]. Reported results which are less than or equal to five times ($\leq 5X$) the blank concentration may be biased high.
PB	=	The preparation blank had reported results greater than the MDLs [results are in parenthesis]. Reported results which are less than or equal to five times ($\leq 5X$) the blank concentration may be biased high.
CBN	=	Continuing calibration blanks had reported negative results greater than absolute value of MDL [results are in parenthesis]. Quantitation limits may be biased low.
MSL	=	The matrix spike recovery was low ($>30\%$ but $<75\%$) [the %recovery is in parenthesis]. Reported results and quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODE

Q = No analytical result.

Appendix B

Data Summary Forms (DSFs)

DATA SUMMARY FORM: INORGANIC

Page 1 of 4

Case #: 37813

SDG : MC1GF2

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 17

Lab. :

CHEM

Dissolved Metals

Sample Number :		MC1GF1		MC1GF2		MC1GF3		MC1GF4		MC1GF5	
Sampling Location :		BG08-GW-MP01		BG08-GW-MP02		BG08-GW-MP03		BG08-GW-MP04		BG08-GW-MP05	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/28/2008		8/29/2008		8/29/2008		8/28/2008		8/28/2008	
Time Sampled :		12:40		11:15		10:00		14:06		15:50	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	0.43	B	1.2	B	0.25	B	0.23	B	0.21	B
*ARSENIC	1	1.3	B	6.6		2.5		3.2		2.3	
BARIUM	10	35.7		40.2		23.9		81.0		79.5	
BERYLLIUM	1			0.11	J	0.13	J			0.20	J
*CADMIUM	1	0.11	B	0.13	B					0.18	B
*CHROMIUM	2	0.73	B	1.5	J	1.7	J	1.2	J	1.2	J
COBALT	1	1.9		14.1		7.0		4.0		0.27	B
COPPER	2	0.69	J	0.55	B	0.39	B	0.37	B	0.43	B
*LEAD	1	0.26	B	0.26	B	0.25	B	0.12	B	0.16	B
MANGANESE	1	137		126		92.1		157		250	
*NICKEL	1	5.0		15.5		10.4		5.8		0.83	J
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1	0.063	B	0.070	B		UL		UL	0.067	B
THALLIUM	1	0.17	B	0.15	B						
VANADIUM	5	0.69	B	1.4	J	1.0	B	0.67	B	0.90	B
ZINC	2	10.5		55.7		5.4		16.1		6.3	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 4

Case #: 37813

SDG : MC1GF2

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Dissolved Metals

Sample Number :		MC1GF6		MC1GF7		MC1GF8		MC1GF9		MC1GG0	
Sampling Location :		BG08-GW-MP06		BG08-GW-MP07		BG08-GW-MP08		BG08-GW-MP09		BG08-GW-MP10	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/28/2008		8/28/2008		8/29/2008		8/29/2008		8/29/2008	
Time Sampled :		17:47		18:10		09:10		10:50		11:50	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	0.20	B	0.21	B						
*ARSENIC	1	2.7		21.0		4.3		7.2		3.0	
BARIUM	10	84.6		40.1		18.7		46.2		50.7	
BERYLLIUM	1	0.19	J	0.58	J	0.27	J	0.40	J	0.18	J
*CADMIUM	1					0.13	B				
*CHROMIUM	2	2.4		1.8	J	1.0	B	1.4	J	1.4	J
COBALT	1	1.1		50.4		12.1		24.3		2.9	
COPPER	2	0.39	B	0.34	B	0.62	J	0.35	B	0.40	B
*LEAD	1	0.20	B	0.12	B	0.15	B	0.10	B	0.10	B
MANGANESE	1	211		334		134		121		102	
*NICKEL	1	2.8		69.5		17.5		35.4		5.4	
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1	0.053	B	0.037	B		UL		UL		UL
THALLIUM	1										
VANADIUM	5	1.6	J	1.9	J	1.6	J	2.2	J	1.4	J
ZINC	2	8.2		330		103		174		4.1	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 3 of 4

Case #: 37813

SDG : MC1GF2

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Dissolved Metals

Sample Number :		MC1GG1		MC1GG2		MC1GG3		MC1GG4		MC1GG5	
Sampling Location :		BG08-GW-MP11		BG08-GW-MP12		BG08-GW-MP13		BG08-GW-MW01		BG08-GW-MW02	
Field QC:										Dup. of MC1GG6	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/28/2008		8/28/2008		8/28/2008		8/29/2008		8/29/2008	
Time Sampled :		13:48		13:05		13:25		15:55		13:50	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2									0.23	B
*ARSENIC	1	4.3		1.2	B	2.3		2.7		6.6	
BARIUM	10	105		39.0		72.3		20.4		18.3	
BERYLLIUM	1	0.20	J					0.18	J	0.11	J
*CADMIUM	1									0.14	J
*CHROMIUM	2	2.1		0.68	B	1.4	J	0.85	B	1.8	J
COBALT	1	0.48	B	1.6		3.6		12.3		3.0	
COPPER	2	0.30	B	0.55	B	0.52	B	0.29	B	0.66	J
*LEAD	1							0.52	B	0.27	B
MANGANESE	1	126		206		212		121		107	
*NICKEL	1	0.66	B	2.3		2.1		22.0		7.8	
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL		UL		UL		UL	0.12	B
THALLIUM	1										
VANADIUM	5	3.6	J	1.1	B	0.89	B	1.2	B	1.1	B
ZINC	2	8.5		5.0		12.8		74.9		6.8	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 4 of 4

Case #: 37813

SDG : MC1GF2

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Dissolved Metals

Sample Number :		MC1GG6		MC1GG7							
Sampling Location :		BG08-GW-MW02D		BG08-GW-MW03							
Field QC:		Dup. of MC1GG5									
Matrix :		Water		Water							
Units :		ug/L		ug/L							
Date Sampled :		8/29/2008		8/29/2008							
Time Sampled :		13:50		14:50							
Dilution Factor :		1.0		1.0							
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	7.0		3.0							
BARIUM	10	19.0		18.1							
BERYLLIUM	1	0.11	J								
*CADMIUM	1										
*CHROMIUM	2	0.92	B	0.78	B						
COBALT	1	3.3		3.1							
COPPER	2	3.4		0.37	B						
*LEAD	1	1.2		0.14	B						
MANGANESE	1	108		163							
*NICKEL	1	7.9		5.7							
SELENIUM	5		UL		UL						
SILVER	1	0.067	B	0.043	B						
THALLIUM	1										
VANADIUM	5	1.1	B	1.1	B						
ZINC	2	11.4		15.6							

CRQL = Contract Required Quantitation Limit

*Action Level Exists

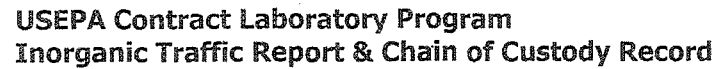
SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



~~37844~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature:	<i>Erik Armistead</i>		
Project Code:	CT4354	Carrier Name:	FedEx		Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942977974,		1	<i>Erik Armistead</i>	9/2/08 1700	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900		2.			
Spill ID:	ALM				3.			
Site Name/State:	Battlefield Golf/VA			4.				
Project Leader:	Erik Armistead							
Action:	Preliminary Assessment							
Sampling Co:	Tetra Tech EM Inc.							

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02A1 <i>mc1GF1</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	777 (HNO3), 891 (HNO3) (2)	BG08-GW-MP01	S: 8/28/2008	12:40	--	
MC02A2 <i>mc1GF2</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	778 (HNO3), 892 (HNO3) (2)	BG08-GW-MP02	S: 8/29/2008	11:15	--	
MC02A3 <i>mc1GF3</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	779 (HNO3), 893 (HNO3) (2)	BG08-GW-MP03	S: 8/29/2008	10:00	--	
MC02A4 <i>mc1GF4</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	780 (HNO3), 894 (HNO3) (2)	BG08-GW-MP04	S: 8/28/2008	14:06	--	
MC02A5 <i>mc1GF5</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	781 (HNO3), 895 (HNO3) (2)	BG08-GW-MP05	S: 8/28/2008	15:50	--	
MC02A6 <i>mc1GF6</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	782 (HNO3), 896 (HNO3) (2)	BG08-GW-MP06	S: 8/28/2008	17:47	--	
MC02A7 <i>mc1GF7</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	783 (HNO3), 897 (HNO3) (2)	BG08-GW-MP07	S: 8/28/2008	18:10	--	
MC02A8 <i>mc1GF8</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	784 (HNO3), 898 (HNO3) (2)	BG08-GW-MP08	S: 8/29/2008	9:10	--	
MC02A9 <i>mc1GF9</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	785 (HNO3), 899 (HNO3) (2)	BG08-GW-MP09	S: 8/29/2008	10:50	--	
MC02B0 <i>mc1GB0</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	786 (HNO3), 900 (HNO3) (2)	BG08-GW-MP10	S: 8/29/2008	11:50	--	
MC02B1 <i>mc1GB1</i>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	787 (HNO3), 901 (HNO3) (2)	BG08-GW-MP11	S: 8/28/2008	13:48	--	

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02B2 mc1662	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 902 (HNO3) (2)	BG08-GW-MP12	S: 8/28/2008	13:05		--
MC02B3 mc1663	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 903 (HNO3) (2)	BG08-GW-MP13	S: 8/28/2008	13:25		--
MC02B4 mc1664	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 904 (HNO3) (2)	BG08-GW-MW01	S: 8/29/2008	15:55		--
MC02B5 mc1665	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 905 (HNO3) (2)	BG08-GW-MW02	S: 8/29/2008	13:50		--
MC02B6 mc1666	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 906 (HNO3) (2)	BG08-GW-MW02D	S: 8/29/2008	13:50		--
MC02B7 mc1667	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 907 (HNO3) (2)	BG08-GW-MW03	S: 8/29/2008	14:50		--
MC02B8 mc1668	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 908 (HNO3) (2)	BG08-SW-SW01	S: 8/29/2008	12:51		--
MC02B9 mc1669	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 909 (HNO3) (2)	BG08-SW-SW02	S: 8/29/2008	15:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	796 (HNO3) (1)	(b) (6);(b) (6)	S: 8/25/2008	9:27		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)	(b) (6);(b) (6)	S: 8/25/2008	9:59		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	798 (HNO3) (1)	(b) (6);(b) (6)	S: 8/26/2008	16:45		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

U.S. EPA Region III Analytical Request Form

JTS 8.25.08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT
DAS#		14
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: _____ SDG No.: MC1GF2SOW No.: ILM05.4

EPA Sample No.

Lab Sample ID

MC1GF1
MC1GF2
MC1GF3
MC1GF4
MC1GF5
MC1GF6
MC1GF7
MC1GF8
MC1GF9
MC1GG0
MC1GG1
MC1GG2
MC1GG3
MC1GG4
MC1GG5
MC1GG6
MC1GG7
MC1GG7D
MC1GG7S

Z4491-02
Z4491-01
Z4491-03
Z4491-04
Z4491-05
Z4491-06
Z4491-07
Z4491-08
Z4491-09
Z4491-10
Z4491-11
Z4491-12
Z4491-13
Z4491-14
Z4491-15
Z4491-16
Z4491-17
Z4491-18
Z4491-19

ICP-AES ICP-MS

Were ICP-AES and ICP-MS interelement corrections applied? (Yes/No) _____ YESWere ICP-AES and ICP-MS background corrections applied? (Yes/No) _____ YESIf yes, were raw data generated before application of background corrections? (Yes/No) _____ NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

(b) (4)

Name: (b) (4)(b) (4)

Date: _____

9/16/08

Title: (b) (4)(b) (4)(b) (4)

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

SDG NARRATIVE

USEPA
SDG # MC1GF2
CASE # 37813
CONTRACT # EPW06047
LAB NAME: CHEMTECH CONSULTING GROUP
LAB CODE: CHEM
CHEMTECH PROJECT #Z4491

A. Number of Samples and Date of Receipt

17 Water Samples was delivered to the laboratory intact on 09/09/2008.

B. Parameters

Test requested for Metals CLP MS.

C. Cooler Temp

Indicator Bottle: Presence/Absence
Cooler: 4°C

D. Detail Documentation (related to Sample Handling Shipping, Analytical Problem, Temp of Cooler etc):

Issue 1: The TR/COC lists the analysis TAL TM+B+M for the ground, surface, and potable well water samples; however, the Scheduling Notification Form lists that the analysis is ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo/Hg, ICP-AES TM+B+Mo/Hg, and ICP-MS Metals for water samples. The laboratory is not sure what analyses should be performed on the water samples.

Issue 2: The laboratory received several water samples that have a container labeled for Dissolved Metals; however, the laboratory is not scheduled to receive any Dissolved Metals samples.

Issue 3: The laboratory received water samples that have the same Sample ID for the Total and Dissolved Metals fraction.

Issue 4: The laboratory received 2 containers for most of the soil samples received for the Case. The laboratory would like to perform the requested analyses from the 1st container and use the 2nd container as extra volume if needed. Are the laboratory's proposed actions acceptable to the Region?

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

E. Corrective Action taken for above:

Resolution 1: Per Region 3, the laboratory will perform the following analyses on the water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis</u>
Ground Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Potable Well	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals

Resolution 2: Per Region 3, the laboratory will perform the following analyses on the Dissolved Metals water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis (filtered)</u>
Ground Water	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg

SMO will note that the laboratory accepted the laboratory's bid price of (b) (4) for ICP-AES 5-10 Metals (plus B and Mo), (b) (4) for ICP-AES 11-22 Metals (plus B and Mo), (b) (4) for ICP-MS 11-16 Metals, and (b) (4) for Mercury for the added Dissolved Metal fraction (bid sheet attached).

Resolution 3: In accordance with previous direction from Region 3, the laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples using the following instructions: The Total Metals sample will keep the CLP sample ID listed on the TR/COC. The SMO coordinator will assign a new CLP sample ID for the Dissolved/Filtered Metals sample, and notify the Region and the laboratory of the new sample ID.

<u>Total Fraction</u>	<u>Dissolved Fraction</u>
MC02A1	MC1GF1
MC02A2	MC1GF2
MC02A3	MC1GF3
MC02A4	MC1GF4
MC02A5	MC1GF5
MC02A6	MC1GF6
MC02A7	MC1GF7
MC02A8	MC1GF8
MC02A9	MC1GF9
MC02B0	MC1GG0
MC02B1	MC1GG1
MC02B2	MC1GG2
MC02B3	MC1GG3
MC02B4	MC1GG4
MC02B5	MC1GG5
MC02B6	MC1GG6
MC02B7	MC1GG7 ✓
MC02B8	MC1GG8
MC02B9	MC1GG9

Resolution 4: Per Region 3, the laboratory's proposed actions are acceptable. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

G. Calculation:

Calculation example for ICP-MS Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample
Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP-MS Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume
and Final Volume made to 50 ml in ICP-MS Water Digestion procedure)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements except for the Silver. Duplicate sample did meet requirements. Serial Dilution did meet requirements.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature (b) (4)
Date 9/16/08

Name: (b) (4)(b) (4)
Title: (b) (4)(b) (4)

SAMPLE LOG-IN SHEET

Lab Name CHEMTECH CONSULTING GROUP

Page 1 of 1

Received By (Print Name) (b) (4) (b) (4)		Log-in Date 9/9/2008			
Received By (Signature) (b) (4) (b) (4)					
Case Number 37813	Sample Delivery Group No. MC1GF2	NRAS Number			
Remarks:		Corresponding			
1. Custody Seal(s) <u>Present</u> /Absent* <u>Intact</u> /Broken	Aqueous Sample pH N/A	EPA Sample #	Sample Tag #	Assigned Lab #	Remarks: Condition of Sample shipment, etc.
2. Custody Seal Nos.		MC1GF2	892	Z4491-01	INTACT
3. Traffic Reports/Chain Of Custody Reports or Packing Lists <u>Present</u> /Absent*		MC1GF1	891	Z4491-02	
4. Airbill <u>Airbill</u> /Sticker <u>Present</u> /Absent*		MC1GF3	893	Z4491-03	
5. Airbill No. 961942977974		MC1GF4	894	Z4491-04	
6. Sample Tags <u>Present</u> /Absent* <u>Listed</u> /Not Listed On TR/Chain-of-Custody		MC1GF5	895	Z4491-05	
7. Sample Condition <u>Intact</u> /Broken*/Leaking		MC1GF6	896	Z4491-06	
8. Cooler Temperature <u>Present</u> /Absent* Indicator Bottle		MC1GF7	897	Z4491-07	
9. Cooler Temperature 4°C		MC1GF8	898	Z4491-08	
10. Does information on custody records, traffic reports, and sample tags agree? <u>Yes</u> /No*		MC1GF9	899	Z4491-09	
11. Date Received at Lab 9.3.08		MC1GG0	8900	Z4491-10	
12. Time Received 9:30am		MC1GG1	8901	Z4491-11	
Sample Transfer		MC1GG2	8902	Z4491-12	
Fraction METALS	MC1GG3	8903	Z4491-13		
Area # Q32	MC1GG4	8904	Z4491-14		
By CHRIS G.	MC1GG5	8905	Z4491-15		
On 9.16.08	MC1GG6	8906	Z4491-16		
	MC1GG7	8907	Z4491-17		
	MC1GG7D	8907	Z4491-18		
	MC1GG7S	8907	Z4491-19		
* Contact SMO and attach record of resolution					
Reviewed By (b) (4)	Logbook No.	(b) (4)			
Date 9.16.08	Logbook Page No.	(b) (4) 9/16/08			



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 2, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen C. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield ~~Golf~~ Club site (Case # 37813 SDG #MC02A1) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0975

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE



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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

LOCKHEED MARTIN
We never forget who we're working for™



DATE: September 30, 2008

SUBJECT: Inorganic Data Validation (IM2 Level)
Case: 37813
SDG: MC02A1
Site: Battlefield Gold Club

FROM: (b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4) (b) (4)
Senior Oversight Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02A1, consisted of twenty-one (21) unfiltered aqueous samples analyzed for total metals, boron (B) and molybdenum (Mo) and two (2) filtrate samples analyzed for dissolved metals, B and Mo. All samples were analyzed by Chemtech Consulting Group (CHEM). The sample set contained two (2) unfiltered rinsate blanks and one (1) unfiltered field duplicate pair. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 (modified) through Routine Analytical Services (RAS) program. Modifications include analysis of B and Mo at the Contract Required Quantitation Limits (CRQLs) of 50 µg/L and 5 µg/L, respectively.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by outliers present in the laboratory and rinsate blanks as well as the ICP serial dilution analysis. Details of these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Continuing calibration (CCB) and/or rinsate (RB) blanks had reported results greater than the Method Detection Limits (MDLs) for the analytes listed below. Positive results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) the blank concentrations may be biased high and have been qualified "B" on the DSFs.

<u>Blank</u>	<u>Affected Analytes</u>
CCB	antimony (Sb), boron (B)
RB	iron (Fe), zinc (Zn)

CCBs and/or preparation blanks (PBs) had negative results greater than the absolute values of the MDLs regarding the analytes listed below. Positive results for these analytes in affected samples which are less than or equal to two times ($\leq 2X$) the absolute values of the blank concentrations may be biased low. The "L" qualifier for these outliers has been superseded by "J" on the DSFs. Quantitation limits for these analytes in affected samples may be biased low and have been qualified "UL" on the DSFs.

<u>Blank</u>	<u>Affected Analytes</u>
CCB	aluminum (Al), mercury (Hg), sodium (Na)
PB	B, cadmium (Cd), lead (Pb), manganese (Mn), Mo, potassium (K), thallium (Tl), Zn

The percent difference (%D) in the ICP serial dilution analysis was outside the control limit ($>10\%$) for Na. Positive results for this analyte in affected samples are estimated due to possible matrix interferences and have been qualified "J" on the DSFs.

NOTES

Reported results between MDLs and CRQLs were qualified "J" on the DSFs unless superseded by "B".

The laboratory exceeded the maximum number of samples per SDG by three (3) samples. According to the SOW and Region 3 Basic Ordering Agreement (BOA) a maximum of twenty (20) samples per SDG is acceptable. The laboratory received approval from the Region to add the three (3) additional samples to this SDG. No data were qualified based on this finding.

The laboratory failed to record the pH values of the samples on the Sample Log-In Sheet (From DC-1) upon receipt. The chain of custody (COC) records indicate that the samples were preserved properly by the sampler. Additionally, the laboratory's preparation sheet for total metals analyses listed the pH as less than two (<2) prior to digestion. No data were qualified based on this finding.

Reported results for field duplicate pair MC02B5/MC02B6 were within 20% RPD, \pm CRQL for all analytes.

The unfiltered sample MC02B9 was used for QC analyses (matrix spike, laboratory duplicate and serial dilution) for both the unfiltered and filtrate samples. Therefore, the reviewer utilized the results from these analyses to evaluate data for samples in both matrices.

In this SDG, the following samples were assigned the same EPA sample numbers for both total and dissolved metals analyses. The SDG Narrative explains that the Sample Management Office (SMO) has assigned new, unique sample numbers to each sample submitted for dissolved metals analysis. The samples submitted for total metals analysis retain the original sample numbers listed on the COC records.

<u>Sample ID on COC</u>	<u>Dissolved Metal Sample ID</u>
MC02B8	MC1GG8
MC02B9	MC1GG9

A CRQL check standard recovery in CRI04 was outside control limits (70-130%) for Hg. The laboratory immediately reanalyzed this CRQL check standard as CRI05, which was within the control limits. No data were qualified based on this finding.

The continuing calibration verification (CCV05) percent recovery for barium (Ba) was slightly outside the upper control limit (>110%). However, due to rounding as required by the SOW, the laboratory reported 110%, which is within control limits. No data were qualified based on this finding.

Data for Case 37813, SDG MC02A1, were reviewed in accordance with National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLE 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORMS
APPENDIX C	CHAIN OF CUSTODY RECORDS
APPENDIX D	LABORATORY CASE NARRATIVE

DCN: 37813.MC02A1IM2.doc

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02A1

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Al	MC02L1		UL	Low	CBN (-23.640 µg/L)
Sb	MC1GG8	B		High	CCB (2.315 J µg/L)
B	MC1GG8, MC1GG9	B		High	CCB (26.815 J µg/L)
	MC02A2, MC02A3, MC02A4	J			>MDL<CRQL PBN (-6.080 J µg/L)
	MC02A6, MC02B0, MC02B4, MC02L0		UL	Low	PBN (-6.080 J µg/L)
Cd	All Samples Except MC02L1, MC1GG8, MC1GG9		UL	Low	PBN (-0.800 J µg/L)
Fe	MC02B8, MC02B9, MC1GG8, MC1GG9	B		High	RB (571 µg/L)
Pb	MC02A1, MC02A4, MC02B2, MC02B3, MC02B9	J			>MDL<CRQL PBN (-1.830 J µg/L)
	MC02B1, MC02L0		UL	Low	PBN (-1.830 J µg/L)
Mn	MC02L0	J			>MDL<CRQL PBN (-1.515 J µg/L)
Mo	All Samples Except MC02B0, MC02L1, MC1GG8, MC1GG9		UL	Low	PBN (-3.055 J µg/L)
Hg	MC02L1, MC1GG8, MC1GG9		UL	Low	CBN (-0.072 J µg/L)

* See explanation of comments in Table 1B

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02A1

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
K	MC02L1		UL	Low	PBN (-65.650 J µg/L)
Na	All Samples Except MC02L0, MC02L1	J			ISD (11%)
	MC02L1		UL	Low	CBN (-139.190 J µg/L)
Tl	All Samples Except MC02L1, MC1GG8, MC1GG9		UL	Low	PBN (-3.805 J µg/L)
Zn	MC02A1, MC02A3, MC02A5, MC02B1, MC02B2, MC02B3, MC02B5, MC02B6	B		High	RB (2.1 J µg/L)
	MC02L0	J			>MDL<CRQL PBN (-2.010 J µg/L)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CBN	=	Continuing calibration blanks had negative results with absolute values >MDLs [results are in parenthesis]. Quantitation limits may be biased low.
CCB	=	Continuing calibration blanks had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ the blank concentrations may be biased high.
>MDL = <CRQL		Reported results are greater than MDLs but less than CRQLs and are considered estimated.
PBN	,=	Preparation blanks had negative results with absolute values >MDLs [results are in parenthesis]. Positive results which are $\leq 2X$ the absolute values of the blank concentrations and quantitation limits may be biased low.
RB	=	Rinsate blank had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ the blank concentrations may be biased high.
ISD	=	Percent difference (%D) in the ICP serial dilution analysis was outside control limits (>10%) [%D is in parenthesis]. Positive results are estimated.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 5

Case #: 37813

SDG : MC02A1

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 23

Lab. :

CHEM

ALL TOTAL METALS

Sample Number :		MC02A1		MC02A2		MC02A3		MC02A4		MC02A5	
Sampling Location :		BG08-GW-MP01		BG08-GW-MP02		BG08-GW-MP03		BG08-GW-MP04		BG08-GW-MP05	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/28/2008		8/29/2008		8/29/2008		8/28/2008		8/28/2008	
Time Sampled :		12:40		11:15		10:00		14:06		15:50	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	100	J	1460		202		177	J	1060	
ANTIMONY	60										
*ARSENIC	10			10.7				2.6	J	4.6	J
BARIUM	200	34.9	J	48.1	J	22.9	J	79.4	J	83.4	J
BERYLLIUM	5										
BORON	50	15.2	J	5.6	J	9.9	J	7.4	J	14.9	J
*CADMIUM	5		UL		UL		UL		UL		UL
CALCIUM	5000	27500		32300		65700		20000		41000	
*CHROMIUM	10	1.1	J	11.1		3.5	J	2.1	J	4.3	J
COBALT	50			12.1	J	5.2	J				
COPPER	25			2.4	J						
IRON	100	8060		13100		11700		9590		12900	
*LEAD	10	1.7	J	11.8		8.9	J	2.8	J	6.1	J
MAGNESIUM	5000	5750		12300		34600		3730	J	9190	
MANGANESE	15	149		204		135		160		272	
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2			0.073	J						
*NICKEL	40			10.2	J	5.7	J				
POTASSIUM	5000	5770		2430	J	4880	J	4440	J	6180	
SELENIUM	35										
SILVER	10										
SODIUM	5000	18600	J	12500	J	21600	J	8950	J	12300	J
THALLIUM	25		UL		UL		UL		UL		UL
VANADIUM	50			4.0	J						
ZINC	60	6.2	B	60.6		9.8	B	12.8	J	6.4	B

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

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DATA SUMMARY FORM: INORGANIC

Page 2 of 5

Case #: 37813

SDG : MC02A1

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

ALL TOTAL METALS

Sample Number :		MC02A6		MC02A7		MC02A8		MC02A9		MC02B0	
Sampling Location :		BG08-GW-MP06		BG08-GW-MP07		BG08-GW-MP08		BG08-GW-MP09		BG08-GW-MP10	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/28/2008		8/28/2008		8/29/2008		8/29/2008		8/29/2008	
Time Sampled :		17:47		18:10		09:10		10:50		11:50	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	1030		423		241		5570		5510	
ANTIMONY	60										
*ARSENIC	10	3.5	J	19.8		6.4	J	13.2		8.2	J
BARIUM	200	85.7	J	33.7	J			74.0	J	99.6	J
BERYLLIUM	5							0.43	J		
BORON	50		UL	22.7	J	39.1	J	13.6	J		UL
*CADMIUM	5		UL		UL		UL		UL		UL
CALCIUM	5000	59300		62900		48600		22700		40400	
*CHROMIUM	10	8.9	J	3.3	J	1.2	J	29.3		85.2	
COBALT	50			47.2	J	9.9	J	37.1	J	6.2	J
COPPER	25							6.9	J	23.7	J
IRON	100	16300		38400		12800		20900		23100	
*LEAD	10	17.3		28.3		20.9		27.3		20.4	
MAGNESIUM	5000	37500		17100		13700		19100		12800	
MANGANESE	15	224		348		143		211		206	
MOLYBDENUM	5		UL		UL		UL		UL	9.7	
MERCURY	0.2										
*NICKEL	40			61.0		11.5	J	54.7		18.5	J
POTASSIUM	5000	3210	J	1710	J	2790	J	2520	J	2440	J
SELENIUM	35										
SILVER	10										
SODIUM	5000	26900	J	8080	J	11800	J	19200	J	10900	J
THALLIUM	25		UL		UL		UL		UL		UL
VANADIUM	50							16.4	J	14.7	J
ZINC	60	14.3	J	326		89.8		244		29.1	J

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 3 of 5

Case #: 37813

SDG : MC02A1

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

ALL TOTAL METALS

Sample Number :		MC02B1		MC02B2		MC02B3		MC02B4		MC02B5	
Sampling Location :		BG08-GW-MP11		BG08-GW-MP12		BG08-GW-MP13		BG08-GW-MW01		BG08-GW-MW02	
Field QC :										Dup of MC02B6	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/28/2008		8/28/2008		8/28/2008		8/29/2008		8/29/2008	
Time Sampled :		13:48		13:05		13:25		15:55		13:50	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	224		687		70.7	J	76.5	J	275	
ANTIMONY	60										
*ARSENIC	10	3.3	J					3.4	J	6.7	J
BARIUM	200	103	J	41.4	J	70.0	J				
BERYLLIUM	5										
BORON	50	19.0	J	52.5		24.7	J		UL	29.4	J
*CADMIUM	5		UL		UL		UL		UL		UL
CALCIUM	5000	19800		37100		31100		22400		71400	
*CHROMIUM	10	2.8	J	4.6	J	0.96	J			0.80	J
COBALT	50							11.4	J		
COPPER	25										
IRON	100	13700		7010		11900		4320		5160	
*LEAD	10		UL	2.0	J	1.9	J	13.1		15.6	
MAGNESIUM	5000	3980	J	5780		4300	J	14200		20300	
MANGANESE	15	127		243		211		126		120	
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2										
*NICKEL	40							17.9	J		
POTASSIUM	5000	4620	J	8660		5950		1180	J	1690	J
SELENIUM	35										
SILVER	10										
SODIUM	5000	11100	J	35300	J	18800	J	12200	J	32400	J
THALLIUM	25		UL		UL		UL		UL		UL
VANADIUM	50										
ZINC	60	5.2	B	4.2	B	7.1	B	70.8		8.6	B

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

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Case #: 37813

SDG : MC02A1

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

ALL TOTAL METALS

Sample Number :		MC02B6		MC02B7		MC02B8		MC02B9		MC02L0	
Sampling Location :		BG08-GW-MW02D		BG08-GW-MW03		BG08-SW-SW01		BG08-SW-SW02		BG08-RB01	
Field QC :		Dup of MC02B5								Rinsate Blank	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/26/2008	
Time Sampled :		13:50		14:50		12:51		15:40		10:15	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	397		561		403		630			
ANTIMONY	60										
*ARSENIC	10	5.8	J	3.4	J						
BARIUM	200					30.0	J	37.9	J		
BERYLLIUM	5					0.59	J	0.55	J		
BORON	50	27.5	J	17.4	J	25.6	J	22.1	J		UL
*CADMIUM	5		UL		UL		UL		UL		UL
CALCIUM	5000	72100		59500		19300		24900		376	J
*CHROMIUM	10	1.2	J	1.9	J						
COBALT	50					5.6	J	9.2	J		
COPPER	25										
IRON	100	5380		8030		996	B	1140	B	124	
*LEAD	10	16.1		16.2		4.8	J	1.4	J		UL
MAGNESIUM	5000	20200		18800		7250		8530			
MANGANESE	15	123		184		360		358		2.4	J
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2										
*NICKEL	40					3.6	J	4.9	J		
POTASSIUM	5000	1810	J	2590	J	2620	J	4680	J		
SELENIUM	35										
SILVER	10										
SODIUM	5000	32600	J	25000	J	14600	J	23400	J		
THALLIUM	25		UL		UL		UL		UL		UL
VANADIUM	50			2.8	J						
ZINC	60	6.5	B	24.1	J	24.7	J	26.0	J	1.9	J

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 5 of 5

Case #: 37813

SDG : MC02A1

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

		TOTAL		DISSOLVED		DISSOLVED					
Sample Number :		MC02L1		MC1GG8		MC1GG9					
Sampling Location :		BG08-RB02		BG08-SW-SW01		BG08-SW-SW02					
Field QC :		Rinsate Blank									
Matrix :		Water		Water		Water					
Units :		ug/L		ug/L		ug/L					
Date Sampled :		8/26/2008		8/29/2008		8/29/2008					
Time Sampled :		10:15		12:51		15:40					
Dilution Factor :		1.0		1.0		1.0					
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200		UL	319		478					
ANTIMONY	60			5.9	B						
*ARSENIC	10										
BARIUM	200			33.3	J	40.6	J				
BERYLLIUM	5			0.52	J	0.50	J				
BORON	50			34.8	B	30.9	B				
*CADMIUM	5										
CALCIUM	5000	527	J	18400		23300					
*CHROMIUM	10										
COBALT	50			4.8	J	8.2	J				
COPPER	25										
IRON	100	571		665	B	254	B				
*LEAD	10										
MAGNESIUM	5000	116	J	6520		7510					
MANGANESE	15	8.0	J	346		339					
MOLYBDENUM	5										
MERCURY	0.2		UL		UL		UL				
*NICKEL	40			11.3	J	13.1	J				
POTASSIUM	5000		UL	2700	J	4610	J				
SELENIUM	35										
SILVER	10										
SODIUM	5000		UL	15700	J	24400	J				
THALLIUM	25										
VANADIUM	50										
ZINC	60	2.1	J	22.1	J	22.8	J				

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



~~37814~~ 37813

R

DAS No:

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By (Date / Time)	Received By (Date / Time)
Account Code:		Airbill:	961942977974.	1 <i>Erik Armistead</i> 9/2/08 1700	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	2.	
Spill ID:	ALM			3.	
Site Name/State:	Battlefield Golf/VA			4.	
Project Leader:	Erik Armistead				
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02A1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	777 (HNO3), 891 (HNO3) (2)	BG08-GW-MP01	S: 8/28/2008	12:40		--
MC02A2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	778 (HNO3), 892 (HNO3) (2)	BG08-GW-MP02	S: 8/29/2008	11:15		--
MC02A3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	779 (HNO3), 893 (HNO3) (2)	BG08-GW-MP03	S: 8/29/2008	10:00		--
MC02A4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	780 (HNO3), 894 (HNO3) (2)	BG08-GW-MP04	S: 8/28/2008	14:06		--
MC02A5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	781 (HNO3), 895 (HNO3) (2)	BG08-GW-MP05	S: 8/28/2008	15:50		--
MC02A6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	782 (HNO3), 896 (HNO3) (2)	BG08-GW-MP06	S: 8/28/2008	17:47		--
MC02A7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	783 (HNO3), 897 (HNO3) (2)	BG08-GW-MP07	S: 8/28/2008	18:10		--
MC02A8	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	784 (HNO3), 898 (HNO3) (2)	BG08-GW-MP08	S: 8/29/2008	9:10		--
MC02A9	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	785 (HNO3), 899 (HNO3) (2)	BG08-GW-MP09	S: 8/29/2008	10:50		--
MC02B0	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	786 (HNO3), 900 (HNO3) (2)	BG08-GW-MP10	S: 8/29/2008	11:50		--
MC02B1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	787 (HNO3), 901 (HNO3) (2)	BG08-GW-MP11	S: 8/28/2008	13:48		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]



~~37814~~ 37813

5

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Received By (Date / Time) 1 2. 3. 4.	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx		
Account Code:		Airbill:	961942977974,		
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)		
Spill ID:	ALM		284 Sheffield Street		
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092		
Project Leader:	Erik Armistead		(908) 789-8900		
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

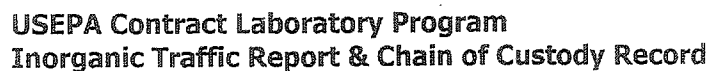
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02B2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 902 (HNO3) (2)	BG08-GW-MP12	S: 8/28/2008	13:05	--	
MC02B3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 903 (HNO3) (2)	BG08-GW-MP13	S: 8/28/2008	13:25	--	
MC02B4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 904 (HNO3) (2)	BG08-GW-MW01	S: 8/29/2008	15:55	--	
MC02B5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 905 (HNO3) (2)	BG08-GW-MW02	S: 8/29/2008	13:50	--	
MC02B6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 906 (HNO3) (2)	BG08-GW-MW02D	S: 8/29/2008	13:50	--	
MC02B7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 907 (HNO3) (2)	BG08-GW-MW03	S: 8/29/2008	14:50	--	
MC02B8 MC1668	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 908 (HNO3) (2)	BG08-SW-SW01	S: 8/29/2008	12:51	--	
MC02B9 MC1669	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 909 (HNO3) (2)	BG08-SW-SW02	S: 8/29/2008	15:40	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	796 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:27	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:59	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	798 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	16:45	--	

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]



37814-32815

813 (E)

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Received By (Date / Time) 1. 2. 3. 4.	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx		
Account Code:		Airbill:	961942977974,		
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)		
Spill ID:	ALM		284 Sheffield Street		
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092		
Project Leader:	Erik Armistead		(908) 789-8900		
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02K0	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	869 (Ice Only), 870 (Ice Only) (2)	BG08-SS-MP04	S: 8/25/2008	13:24		--
MC02K1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	871 (Ice Only), 872 (Ice Only) (2)	BG08-SS-MP05	S: 8/25/2008	14:15		--
MC02K2	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	873 (Ice Only), 874 (Ice Only) (2)	BG08-SS-MP06	S: 8/25/2008	15:07		--
MC02K3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	875 (Ice Only), 876 (Ice Only) (2)	BG08-SS-MP07	S: 8/25/2008	15:57		--
MC02K4	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	877 (Ice Only), 878 (Ice Only) (2)	BG08-SS-MP08	S: 8/25/2008	17:10		--
MC02K5	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	879 (Ice Only), 880 (Ice Only) (2)	BG08-SS-MP09	S: 8/26/2008	8:01		--
MC02K6	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	881 (Ice Only), 882 (Ice Only) (2)	BG08-SS-MP10	S: 8/26/2008	8:35		--
MC02K7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	883 (Ice Only), 884 (Ice Only) (2)	BG08-SS-MP11	S: 8/26/2008	9:36		--
MC02K8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	885 (Ice Only), 886 (Ice Only) (2)	BG08-SS-MP12	S: 8/26/2008	10:20		--
MC02K9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	887 (Ice Only), 888 (Ice Only) (2)	BG08-SS-MP13	S: 8/26/2008	11:10		--
MC02L0	Ground Water/ Erik Armistead	L/G	TAL TM+B+M (14)	889 (HNO3) (1)	BG08-RB01	S: 8/26/2008	10:15		Pinsate

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)



~~37814~~ 37813

DAS No:

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Sampler Signature: <i>Erik Armistead</i> Received By (Date / Time)
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L1	Ground Water/ Erik Armistead	L/G	TAL TM+B+M (14)	890 (HNO3) (1)	BG08-RB02	S: 8/26/2008	10:15		Rinsate

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: 1629.0 SDG No.: MC02A1SOW No.: ILM05.4

EPA Sample No.

Lab Sample ID

MC02A1
MC02A2
MC02A3
MC02A4
MC02A5
MC02A6
MC02A7
MC02A8
MC02A9
MC02B0
MC02B1
MC02B2
MC02B3
MC02B4
MC02B5
MC02B6
MC02B7
MC02B8
MC02L0
MC02B9
MC02B9D
MC02B9S
MC02L1
MC1GG8
MC1GG9

Z4452-01
Z4452-02
Z4452-03
Z4452-04
Z4452-05
Z4452-06
Z4452-07
Z4452-08
Z4452-09
Z4452-10
Z4452-11
Z4452-12
Z4452-13
Z4452-14
Z4452-15
Z4452-16
Z4452-17
Z4452-18
Z4452-19
Z4452-21
Z4452-22
Z4452-23
Z4452-24
Z4452-25
Z4452-26

ICP-AES ICP-MS

Were ICP-AES and ICP-MS interelement corrections applied? (Yes/No) YESWere ICP-AES and ICP-MS background corrections applied? (Yes/No) YESIf yes, were raw data generated before application of background corrections? (Yes/No) NO

Comments:

THE "E" QUALIFIERS ON FORM I AND VIII FOR SODIUM INDICATE CHEMICAL OR PHYSICAL INTERFERENCE EFFECTS.
WHICH WERE SUSPECTED DURING THAT ELEMENT'S ANALYSES ONLY.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4)Name: (b) (4)(b) (4)Date: 9/16/08Title: (b) (4)(b) (4)(b) (4)

COVER PAGE

ILM05.4

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

SDG NARRATIVE

USEPA
SDG # MC02A1
CASE # 37813
CONTRACT # EPW06047
LAB NAME: CHEMTECH CONSULTING GROUP
LAB CODE: CHEM
CHEMTECH PROJECT #Z4452
MODIFIED ANALYSIS: 1629.0

A. Number of Samples and Date of Receipt

23 Water Samples were delivered to the laboratory intact on 09/08/2008.

B. Parameters

Test requested for ICP- AES Metals CLP12= (Al, Ca, Fe, Mg, K, Na)+B+MO & HG.

C. Cooler Temp

Indicator Bottle: Presence/Absence
Cooler: 4°C

D. Detail Documentation (related to Sample Handling Shipping, Analytical Problem, Temp of Cooler etc):

Issue 1: The TR/COC lists the analysis TAL TM+B+M for the ground, surface, and potable well water samples; however, the Scheduling Notification Form lists that the analysis is ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo/Hg, ICP-AES TM+B+Mo/Hg, and ICP-MS Metals for water samples. The laboratory is not sure what analyses should be performed on the water samples.

Issue 2: The laboratory received several water samples that have a container labeled for Dissolved Metals; however, the laboratory is not scheduled to receive any Dissolved Metals samples.

Issue 3: The laboratory received water samples that have the same Sample ID for the Total and Dissolved Metals fraction.

Issue 4: The laboratory received 2 containers for most of the soil samples received for the Case. The laboratory would like to perform the requested analyses from the 1st container and use the 2nd container as extra volume if needed. Are the laboratory's proposed actions acceptable to the Region?

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

E. Corrective Action taken for above:

Resolution 1: Per Region 3, the laboratory will perform the following analyses on the water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis</u>
Ground Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Potable Well	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals

Resolution 2: Per Region 3, the laboratory will perform the following analyses on the Dissolved Metals water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis (filtered)</u>
Ground Water	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg

SMO will note that the laboratory accepted the laboratory's bid price of (b) (4) for ICP-AES 5-10 Metals (plus B and Mo), (b) (4) for ICP-AES 11-22 Metals (plus B and Mo), (b) (4) for ICP-MS 11-16 Metals, and (b) (4) for Mercury for the added Dissolved Metal fraction (bid sheet attached).

Resolution 3: In accordance with previous direction from Region 3, the laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples using the following instructions: The Total Metals sample will keep the CLP sample ID listed on the TR/COC. The SMO coordinator will assign a new CLP sample ID for the Dissolved/Filtered Metals sample, and notify the Region and the laboratory of the new sample ID.

<u>Total Fraction</u>	<u>Dissolved Fraction</u>
MC02A1	MC1GF1
MC02A2	MC1GF2
MC02A3	MC1GF3
MC02A4	MC1GF4
MC02A5	MC1GF5
MC02A6	MC1GF6
MC02A7	MC1GF7
MC02A8	MC1GF8
MC02A9	MC1GF9
MC02B0	MC1GG0
MC02B1	MC1GG1
MC02B2	MC1GG2
MC02B3	MC1GG3
MC02B4	MC1GG4
MC02B5	MC1GG5
MC02B6	MC1GG6
MC02B7	MC1GG7
MC02B8	MC1GG8
MC02B9	MC1GG9

Resolution 4: Per Region 3, the laboratory's proposed actions are acceptable. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

G. Calculation:

Calculation example for ICP-AES Water Sample:

Results reported in Ug/L = Results in ppm X 1000 X Dilution Factor (if any) X Fraction of Sample Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP Water- Prep = 100/100 or 50/50 =1
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume and Final Volume made to 50 ml in ICP-AES Water Digestion procedure)

Calculation example for Hg Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample Amount Taken in Water Hg-Prep.

Fraction of Sample Amount Taken in Water Hg-Prep = 100/100 =1
(if 100 ml Initial Volume taken and made it to Final Volume as 100 ml)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements. Duplicate sample did meet requirements. Serial Dilution did meet requirements except for Sodium.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature (b) (4)
Date 9/16/08

Name: (b) (4)(b) (4)
Title: (b) (4)(b) (4)

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

parveen

From: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)
Sent: Thursday, September 11, 2008 7:46 AM
To: (b) (4)
Cc: slizys.dan@epa.gov; Harris.Carroll@epamail.epa.gov; thaung.khin-cho@epa.gov; kwedar.john@epa.gov
Subject: Region 03 | Case 37813 | Lab CHEM | Issue Laboratory problems | FINAL

Parveen,

Summary Start

Issue: The laboratory would like to place 23 water samples for ICP-AES TM by MA 1629.0 into one SDG.

Resolution: Per Region 3, the laboratory's proposal is acceptable. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

Summary End

Please let me know if you have any further questions or problems.

Thanks,

(b) (4)

(b) (4)(b) (4)
Computer Sciences Corporation (CSC)
(b) (4)(b) (4)
(b) (4)(b) (4)(b) (4)

-----Original Message-----

From: Slizys.Dan@epamail.epa.gov [mailto:Slizys.Dan@epamail.epa.gov]
Sent: Thursday, September 11, 2008 7:05 AM
To: (b) (4)
Cc: Harris.Carroll@epamail.epa.gov; kwedar.john@epa.gov; thaung.khin-cho@epa.gov
Subject: Re: NEW ISSUE | Case 37813 | Lab CHEM | Issue Laboratory problems |

Colin,

The lab's proposal is acceptable to place 23 samples into one SDG.

(b) (4)(b) (4)
(b) (4)(b) (4)
(b) (4)
To
Dan Slizys/ESC/R3/USEPA/US@EPA,
09/10/2008 02:08 PM Carroll
Harris/ESC/R3/USEPA/US@EPA
cc
Khin-Cho
Thaung/ESC/R3/USEPA/US@EPA, John
Kwedar/ESC/R3/USEPA/US@EPA
Subject
NEW ISSUE | Case 37813 | Lab CHEM
| Issue Laboratory problems |

9/11/2008

Dan/Carroll,

CHEM is reporting the following issue for Case 37813. Please advise.

Issue: The laboratory would like to place 23 water samples for ICP-AES TM by MA 1629.0 into one SDG.

Please let me know if you need any further information.

Thanks,

(b) (4)

(b) (4)(b) (4)

Computer Sciences Corporation (CSC)

(b) (4)(b) (4)

(b) (4)(b) (4)(b) (4)

9/10/08, 1:50 PM, Phone conversation between (b) (4)(b) (4) (CHEM) and (b) (4) (SMO). (b) (4) asked if the laboratory can place 23 water samples for ICP-AES TM by MA 1629.0 into one SDG.

9/11/2008

INORGANIC / ORGANIC COMPLETE SDG FILE (CSF) INVENTORY CHECKLIST

Case No.: 37813

SDG Nos.: MC02A1

Date Rec'd: 9/17/08

EPA Lab ID: CHEM

Lab Location: Mountainside, NJ

Region: 3

Audit No.

Re-submitted CSF? Yes ___ No X

COMMENTS:

The DC-1 lists incorrect sample tag numbers as follows:

Sample tag no.	sample no.	Correct sample tag no.
891	MC02A1	777
892	MC02A2	778
893	MC02A3	779
894	MC02A4	780
895	MC02A5	781
896	MC02A6	782
897	MC02A7	783
898	MC02A8	784
899	MC02A9	785
900	MC02B0	786
901	MC02B1	787
902	MC02B2	788
903	MC02B3	789
904	MC02B4	790
905	MC02B5	791
906	MC02B6	792
907	MC02B7	793
908	MC02B8	794
909	MC02B9;	795
	MC02B9D;	
	MC02B9S	

These sample tag numbers correspond to the dissolved metals aliquots which were assigned new sample numbers by SMO and the results of which are not included in this data package. The duplicate entries of sample tag numbers 908 and 909 are correctly assigned to sample numbers MC1GG8 and MC1GG9, respectively. Sample tag numbers 908 and 909 are missing from the data package. The laboratory should submit a corrected DC-1 and the missing tags.

ORIGINALS

Custody Seals

1. Present on package?

2. Intact upon receipt?

Form DC-2

3. Numbering scheme accurate?

4. Are enclosed documents listed ?

5. Are listed documents enclosed?

Form DC-1

6. Present?

7. Complete?

8. Accurate?

Chain-of-Custody Record(s) / TR

9. Signed?

10. Dated?

Air Bills / Air Bill Sticker

11. Present?

Sample Tags

12. Does DC-1 list tags as being included?

13. Present?

Other Documents

ADDITIONAL COMMENTS: Also, the correspondence on page 283 requests permission to place 23 water samples for ICP-AES TM into one SDG, but this SDG contains analytical results for 21 total metals and 2 dissolved metals. The laboratory should provide an explanation.

Audited By:	Signature: (b) (4)	Name/Title: (b) (4)(b) (4)(b) (4)(b) (4)	Date: 9/10/08
Audited By:	Signature:	Name/Title:	Date:
Audited By:	Signature:	Name/Title:	Date:



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : September 30, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Gulf Club site (Case # 37813 SDG #MC02C1) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

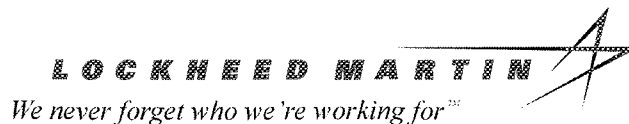
cc: Joshua Cope (TETRA TECH EMI)

TO File #: 0014

TDF#: 0976

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597



Date: September 30, 2008

Subject: Inorganic Data Validation (IM2 Level)
Case: 37813
SDG : MC02C1
Site : Battlefield Golf Club

From: (b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4)(b) (4)(b) (4) (b) (4)
Senior Oversight Chemist

To: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02C1, consisted of twenty (20) aqueous samples analyzed for aluminum (Al), calcium (Ca), iron (Fe), magnesium (Mg), potassium (K), sodium (Na) and mercury (Hg). In addition, boron (B) and molybdenum (Mo) were analyzed per modification reference number 1629.0. The sample set included one (1) field duplicate pair. Samples were analyzed by ChemTech Consulting Group (CHEM) according to the Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by outliers present in the laboratory blanks and ICP serial dilution analyses. Details of these outliers are discussed under "Minor Problems," specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Continuing calibration (CCB) and preparation (PB) blanks had reported results greater than the Method Detection Limit (MDL) for boron. The positive results for this analyte in affected samples which are less than or equal to five times ($\leq 5X$) the blank concentration may be biased high and have been qualified "B" on the DSFs.

CCBs had negative results greater than the absolute value of the MDL for Hg. The quantitation limits for this analyte in affected samples may be biased low and have been qualified "UL" on the DSFs.

The percent difference (%D) in the ICP serial dilution analysis was outside the control limit (>10%) for Na. The positive results for this analyte in all samples are estimated due to possible matrix interferences and has been qualified "J" on the DSFs.

NOTES

Results for field duplicate pair MC02D4/MC02D5 were comparable.

Reported results between MDLs and Contract Required Quantitation Limits (CRQLs) were qualified "J" on the DSFs.

Data for Case 37813, SDG MC02C1, were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

Table 1A	Summary of qualifiers on data summary forms after data validation
Table 1B	Codes used in comments column of Table 1A
Appendix A	Glossary of Data Qualifier Codes
Appendix B	Data Summary Form(s)
Appendix C	Chain of Custody Records
Appendix D	Laboratory Case Narrative

DCN: 37813_MC02C1

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02C1

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Hg	All samples except MC02C2, MC02D6, MC02D7, MC02D8, MC02D9, MC02E0, MC02E1		UL	Low	CBN (-0.121 J ug/L)
	MC02D6, MC02D7, MC02D8, MC02D9, MC02E0, MC02E1		UL	Low	CBN (-0.099 J ug/L)
Na	All samples	J			ISD (19%)
B	MC02C8	B		High	CCB (17.605 J ug/L)
	MC02D3, MC02D4, MC02D6, MC02D8	B		High	PB (5.965 J ug/L)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CBN	=	Continuing calibration blanks had negative results with absolute values > MDL [results are in parenthesis]. The quantitation limit may be biased low.
ISD	=	Percent difference (%D) in the ICP serial dilution analysis was outside the control limit (>10%) [%D is in parenthesis]. Positive results are estimated.
CCB	=	Continuing calibration blank had result >MDL [result is in parenthesis]. The positive result which is $\leq 5X$ the blank concentration may be biased high.
PB	=	Preparation blank had result > MDL [result is in parenthesis]. Positive results which are $\leq 5X$ the blank concentration may be biased high.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 2

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Number of Soil Samples : 0

Number of Water Samples : 20

Total Metals

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)					
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)					
Matrix :	Water	Water	Water	Water	Water	Water					
Units :	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L					
Date Sampled :	8/25/2008	8/26/2008	8/26/2008	8/25/2008	8/25/2008	8/25/2008					
Time Sampled :	09:59	16:45	16:45	10:43	10:40						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	21.5	J	22.7	J						
BORON	50	275		290		295		113		116	
CALCIUM	5000	65500		62900		66100		67900		26300	
IRON	100	615		12.6	J	631		1190		180	
MAGNESIUM	5000	42000		43500		44000		18300		12800	
MOLYBDENUM	5										
MERCURY	0.2		UL	0.40			UL		UL		UL
POTASSIUM	5000	23200		24400		24900		8760		9450	
SODIUM	5000	222000	J	247000	J	247000	J	69300	J	51800	J

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	
Time Sampled :		11:24		11:31		13:28		13:36		14:16	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200			20.7	J			23.7	J	93.6	J
BORON	50	114		29.1	B	107		124		54.9	
CALCIUM	5000	26100		15600		39500		41700		71600	
IRON	100	175		12900		1980		1760		2830	
MAGNESIUM	5000	12800		6670		19300		19800		17200	
MOLYBDENUM	5										
MERCURY	0.2		UL		UL		UL		UL		UL
POTASSIUM	5000	9480		2970	J	10500		11100		4810	J
SODIUM	5000	51200	J	10100	J	68700	J	76700	J	49800	J

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 2

Case #: 37813

SDG (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)
Field QC :			Dup. of MC02D5	Dup. of MC02D4	
Matrix :	Water	Water	Water	Water	Water
Units :	ug/L	ug/L	ug/L	ug/L	ug/L
Date Sampled :	8/25/2008	8/25/2008	8/25/2008	8/25/2008	8/25/2008
Time Sampled :	15:15	16:23	19:19	19:19	20:15
Dilution Factor :	1.0	1.0	1.0	1.0	1.0
ANALYTE	CRQL	Result	Flag	Result	Flag
ALUMINUM	200				
BORON	50	94.4		16.9	B
CALCIUM	5000	73900		42600	
IRON	100	1420		6600	
MAGNESIUM	5000	18000		18400	
MOLYBDENUM	5				
MERCURY	0.2		UL		UL
POTASSIUM	5000	7540		2530	J
SODIUM	5000	64400	J	32600	J

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)
Matrix :	Water	Water	Water	Water	Water
Units :	ug/L	ug/L	ug/L	ug/L	ug/L
Date Sampled :	8/26/2008	8/26/2008	8/26/2008	8/26/2008	8/26/2008
Time Sampled :	07:46	08:19	09:18	09:16	10:26
Dilution Factor :	1.0	1.0	1.0	1.0	1.0
ANALYTE	CRQL	Result	Flag	Result	Flag
ALUMINUM	200				
BORON	50	363		26.6	B
CALCIUM	5000	32000		37400	
IRON	100	192		644	
MAGNESIUM	5000	28900		5050	
MOLYBDENUM	5				
MERCURY	0.2		UL		UL
POTASSIUM	5000	20600		2670	J
SODIUM	5000	340000	J	16600	J

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain of Custody Records

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RASH#	CT4353	Analytical TAT 14
DASH#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
		Date Approved: 8/20/2008	
EPA Project Leader: CHRIS WAGNER	Phone#:	Cell Phone #: 804-337-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOSHUA COPE	Phone#: 610-364-2130	Cell Phone #: 215-768-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK ARMISTEAD	Phone#: 610-364-2151	Cell Phone #: 267 446 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Received By (Date / Time) 1 2 3 4	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx		
Account Code:		Airbill:	961942977974,		
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)		
Spill ID:	ALM		284 Sheffield Street Mountainside NJ 07092 (908) 789-8900		
Site Name/State:	Battlefield Golf/VA				
Project Leader:	Erik Armistead				
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02B2 MC16-6-2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 902 (HNO3) (2)	BG08-GW-MP12	S: 8/28/2008	13:05		recd. 9/17/08 dwp
MC02B3 MC16-6-3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 903 (HNO3) (2)	BG08-GW-MP13	S: 8/28/2008	13:25		-- MC02A1
MC02B4 MC16-6-4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 904 (HNO3) (2)	BG08-GW-MW01	S: 8/29/2008	15:55		recd. 9/17/08 dwp
MC02B5 MC16-6-5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 905 (HNO3) (2)	BG08-GW-MW02	S: 8/29/2008	13:50		-- MC02C1 ICP-AES
MC02B6 MC16-6-6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 906 (HNO3) (2)	BG08-GW-MW02D	S: 8/29/2008	13:50		--
MC02B7 MC16-6-7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 907 (HNO3) (2)	BG08-GW-MW03	S: 8/29/2008	14:50		--
MC02B8 MC16-6-8	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 908 (HNO3) (2)	BG08-SW-SW01	S: 8/29/2008	12:51		--
MC02B9 MC16-6-9	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 909 (HNO3) (2)	BG08-SW-SW02	S: 8/29/2008	15:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	796 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:27		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:59		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	798 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	16:45		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)

REC'D ON 10/28/84



DAS No:

Sampler
Signature: *Erik Christensen*

Received By	(Date / Time)
-------------	---------------

Region:	3
Project Code:	CT4354
Account Code:	
CERCLIS ID:	VAN000306614
Spill ID:	ALM
Site Name/State:	Battlefield Golf/VA
Project Leader:	Erik Armistead
Action:	Preliminary Assessment
Sampling Co:	Tetra Tech EM Inc.

Date Shipped: 9/2/2008
Carrier Name: FedEx
Airbill: 961942977974,
Shipped to: ChemTech Consulting
Group (CHEMED)
284 Sheffield Street
Mountainside NJ 07092
(908) 789-8900

Chain of Custody Record

Relinquished By _____ (Date / Time) _____

1

63

22

4

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	799 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	16:45	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	801 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	10:43	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	802 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	10:40	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	803 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	11:24	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	804 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	11:31	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	805 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	13:28	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	806 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	13:36	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	807 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	14:16	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	808 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	15:15	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	809 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	16:23	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	810 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	19:19	--	--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)

REGION 0000



~~37814~~ 37813 (PA)

R

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	811 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	19:19	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	812 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	813 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	7:46	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	814 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	8:19	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	815 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:18	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	816 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:15	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	817 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:26	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	818 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:50	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	819 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:33	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	820 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26	--	--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	821 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26	--	--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

F2V5.1.047 Page 4 of 10

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: 1629.0 SDG No.: MC02C1SOW No.: ILM05.4

EPA Sample No.

MC02C1
MC02C2
MC02C3
MC02C5
MC02C6
MC02C7
MC02C8
MC02C9
MC02D0
MC02D1
MC02D2
MC02D3
MC02D4
MC02D5
MC02D6
MC02D7
MC02D8
MC02D9
MC02E0
MC02E1
MC02E1D
MC02E1S

Lab Sample ID

Z4398-01
Z4398-02
Z4398-03
Z4398-04
Z4398-05
Z4398-06
Z4398-07
Z4398-08
Z4398-09
Z4398-10
Z4398-11
Z4398-12
Z4398-13
Z4398-14
Z4398-15
Z4398-16
Z4398-17
Z4398-18
Z4398-19
Z4398-20
Z4398-21
Z4398-22

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u> </u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u> </u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u> </u>

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

Date: _____

(b) (4)Name: **(b) (4)(b) (4)**Title: **(b) (4)(b) (4)(b) (4)**

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

SDG NARRATIVE

USEPA

SDG # MC02C1

CASE # 37813

CONTRACT # EPW06047

LAB NAME: CHEMTECH CONSULTING GROUP

LAB CODE: CHEM

CHEMTECH PROJECT #Z4398

MODIFIED ANALYSIS: 1629.0

A. Number of Samples and Date of Receipt

20 Water Samples were delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for ICP- AES Metals CLP12= (Al,Ca,Fe,Mg,K,Na)+B+MO & HG.

C. Cooler Temp

Indicator Bottle: Presence/Absence

Cooler: 4°C

**D. Detail Documentation (related to Sample Handling
Shipping, Analytical Problem, Temp of Cooler etc):****E. Corrective Action taken for above:****F. Analytical Techniques:**

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-AES Water Sample:

Results reported in Ug/L = Results in ppm X 1000 X Dilution Factor (if any) X Fraction of Sample Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume and Final Volume made to 50 ml in ICP-AES Water Digestion procedure)

Calculation example for Hg Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample Amount Taken in Water Hg-Prep.

Fraction of Sample Amount Taken in Water Hg-Prep = $100/100 = 1$
(if 100 ml Initial Volume taken and made it to Final Volume as 100 ml)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements. Duplicate sample did meet requirements. Serial Dilution did meet requirements except for Sodium.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature _____

(b) (4)

Name: (b) (4)(b) (4)

Date _____

9/16/08

Title: (b) (4)(b) (4)

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

parveen

From: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)
Sent: Thursday, September 04, 2008 11:13 AM
To: (b) (4)
Cc: slizys.dan@epa.gov; Harris.Carroll@epamail.epa.gov; thaung.khin-cho@epa.gov;
kwedar.john@epa.gov
Subject: Region 03 | Case 37813 | Lab CHEM | Issue Multiple | FINAL

(b) (4)

Summary Start

-Discrepancies with tags, jars, and/or TR/COC-

Issue 1: The TR/COC lists the analysis TAL TM+B+M for the ground, surface, and potable well water samples; however, the Scheduling Notification Form lists that the analysis is ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo/Hg, ICP-AES TM+B+Mo/Hg, and ICP-MS Metals for water samples. The laboratory is not sure what analyses should be performed on the water samples.

Resolution 1: Per Region 3, the laboratory will perform the following analyses on the water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis</u>
Ground Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Potable Well	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals

Issue 2: The laboratory received several water samples that have a container labeled for Dissolved Metals; however, the laboratory is not scheduled to receive any Dissolved Metals samples.

Resolution 2: Per Region 3, the laboratory will perform the following analyses on the Dissolved Metals water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis (filtered)</u>
Ground Water	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg

SMO will note that the laboratory accepted the laboratory's bid price of (b) (4) for ICP-AES 5-10 Metals (plus B and Mo), (b) (4) for ICP-AES 11-22 Metals (plus B and Mo), (b) (4) for ICP-MS 11-16 Metals, and (b) (4) for Mercury for the added Dissolved Metal fraction (bid sheet attached).

-Incorrect/duplicated sample numbers-

Issue 3: The laboratory received water samples that have the same Sample ID for the Total and Dissolved Metals fraction.

Resolution 3: In accordance with previous direction from Region 3, the laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples using the following instructions: The Total Metals sample will keep the CLP sample ID listed on the TR/COC. The SMO coordinator will assign a new CLP sample ID for the Dissolved/Filtered Metals sample, and notify the Region and the laboratory of the new sample ID.

<u>Total Fraction</u>	<u>Dissolved Fraction</u>
MC02A1	MC1GF1
MC02A2	MC1GF2
MC02A3	MC1GF3
MC02A4	MC1GF4

9/4/2008

MC02A5	MC1GF5
MC02A6	MC1GF6
MC02A7	MC1GF7
MC02A8	MC1GF8
MC02A9	MC1GF9
MC02B0	MC1GG0
MC02B1	MC1GG1
MC02B2	MC1GG2
MC02B3	MC1GG3
MC02B4	MC1GG4
MC02B5	MC1GG5
MC02B6	MC1GG6
MC02B7	MC1GG7
MC02B8	MC1GG8
MC02B9	MC1GG9

-Laboratory problems-

Issue 4: The laboratory received 2 containers for most of the soil samples received for the Case. The laboratory would like to perform the requested analyses from the 1st container and use the 2nd container as extra volume if needed. Are the laboratory's proposed actions acceptable to the Region?

Resolution 4: Per Region 3, the laboratory's proposed actions are acceptable. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

Summary End

Please let me know if you have any further questions or problems.

Thanks,

(b) (4)

(b) (4)(b) (4)

Computer Sciences Corporation (CSC)

(b) (4)(b) (4)

(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

9/4/08, 11:45 AM, Phone conversation between Dan Slizys (Region 3) and (b) (4) (SMO). Dan indicated that the laboratory's proposed actions are acceptable for issue 4.

From: (b) (4)

Sent: Thursday, September 04, 2008 11:12 AM

To: 'slizys.dan@epa.gov'; Harris.Carroll@epamail.epa.gov

Cc: thaung.khin-cho@epa.gov; kwedar.john@epa.gov

Subject: NEW ISSUE | Case 37813 | Lab CHEM | Issue Multiple |

Dan/Carroll,

CHEM is reporting the following issues for Case 37813 (TR/COCs attached). Issues 1, 2, and 3 have been resolved. Please advise on issue 4.

-Discrepancies with tags, jars, and/or TR/COC-

Issue 1: The TR/COC lists the analysis TAL TM+B+M for the ground, surface, and potable well water samples; however, the Scheduling Notification Form lists that the analysis is ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo/Hg, ICP-AES TM+B+Mo/Hg, and ICP-MS Metals for water samples. The laboratory is not sure what analyses should be performed on the water samples.

9/4/2008

220



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 2, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield ~~Golf~~ Club site (Case # 37813 SDG #MC02E2) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0979

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE




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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

DATE: October 1, 2008

SUBJECT: Level IM2 Inorganic Data Validation for Case 37813
SDG: MC02E2
Site: Battlefield Golf Club

FROM: (b) (4)
Inorganic Data Reviewer

Through: (b) (4)(b) (4)(b) (4) 
Senior Data Review Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02E, consisted of twenty (20) aqueous samples analyzed for aluminum (Al), boron (B), calcium (Ca), iron (Fe), magnesium (Mg), mercury (Hg) molybdenum (Mo), potassium (K), and sodium (Na). The sample set included two (2) filed duplicate pairs. All samples were submitted to ChemTech Consulting Group (CHEM) for analyses. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 (Modified) through the Routine Analytical Services (RAS) program. Modifications included analysis of B at a Contract Required Quantitation Limit (CRQL) of 50 ug/L and Mo 5.0 ug/L using modification reference number 1629.0.

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Inorganic Data Review, level IM2. Areas of concern with respect to data usability are listed below.

Data in this Case have been impacted by outliers present in a laboratory blank as well as the ICP serial dilution analysis. Details for these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on a single Data Summary Form (DSF).

MINOR PROBLEMS

The Continuing Calibration Blank (CCB) had a negative value greater than the absolute value of the MDL for aluminum (Al). Quantitation limits for this analyte in affected samples may be biased low and have been qualified "UL" on the DSFs.

The Percent Difference (%D) for the ICP serial dilution analysis was outside the control limit (>10%) for sodium (Na). Reported results for this analyte in all samples are estimated and have been qualified "J" on the DSF.

NOTES

Positive results which are less than the Contract Required Quantitation Limits (CRQLs) but greater than MDLs have been qualified "J" on the DSFs.

Reported results for field duplicate pairs MC02E4/MC02E5 and MC02E8/MC02E9 were within control limits (20% RPD, \pm CRQL) for all analytes.

Results for the Preparation Blank (PB) were not included on Form III. Raw data for this blank was utilized by the reviewer to assess laboratory contamination. No data were impacted.

Data for Case 37813, SDG MC02E2, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses, April 1993.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

TABLES 1A SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER
DATA VALIDATION

TABLE 1B CODES USED IN COMMENTS COLUMN OF TABLES 1A

APPENDIX A GLOSSARY OF DATA QUALIFIER CODES

APPENDIX B DATA SUMMARY FORM(S)

APPENDIX C CHAIN OF CUSTODY RECORD(S)

APPENDIX D LABORATORY CASE NARRATIVE(S)

DCN: 37813_MC02E2. IM2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02E2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Al	All Samples Except MC02F9, MC02G0, MC02G1		UL	Low	CBN (– 20.320 J ug/L)
Na	All samples	J			SD (19%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

SD	=	The Percent difference (%D) for the ICP serial dilution analysis was outside the (10%) control limit. [the %D is in parenthesis]. Positive results are estimated.
CBN	=	The continuing calibration blank had a reported negative result greater than absolute value of MDL [the result is in parenthesis]. Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

- U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
- (NO CODE) = Confirmed identification.
- B = Not detected substantially above the level reported in laboratory or field blanks.
- R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

- J = Analyte Present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- UJ = Not detected, quantitation limit may be inaccurate or imprecise.
- UL = Not detected, quantitation limit is probably higher.

OTHER CODE

- Q = No analytical result.

Appendix B

Data Summary Forms (DSFs)

DATA SUMMARY FORM: INORGANIC

Page 1 of 2

Case #: 37813

SDG: (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 20

Lab. :

CHEM

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Field QC :						(b) (6)(b) (6)		(b) (6)(b) (6)			
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008	
Time Sampled :		10:50		11:33		11:26		11:26		13:16	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200		UL		UL		UL		UL		UL
BORON	50	146		19.7	J	144		146		26.4	J
CALCIUM	5000	28800		33000		24000		24300		24300	
IRON	100	161		5750		148		164		6280	
MAGNESIUM	5000	15400		16300		14700		14700		5310	
MOLYBDENUM	5										
MERCURY	0.2										
POTASSIUM	5000	9000		1410	J	9320		9270		1310	J
SODIUM	5000	85100	J	32300	J	75800	J	75900	J	9370	J

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Field QC :		(b) (6)(b) (6)	(b) (6)(b) (6)								
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/26/2008	8/26/2008	8/26/2008	8/26/2008	8/26/2008						
Time Sampled :	17:18	17:50	17:50	18:51	18:59						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200		UL		UL		UL		UL		UL
BORON	50	207		51.4		56.7		131		122	
CALCIUM	5000	30300		35700		35200		22800		23000	
IRON	100	192		185		187		177		190	
MAGNESIUM	5000	19100		6710		6730		16900		16900	
MOLYBDENUM	5										
MERCURY	0.2	0.067	J								
POTASSIUM	5000	13600		3250	J	3190	J	12400		12000	
SODIUM	5000	157000	J	30600	J	30600	J	59700	J	48300	J

CRQL = Contract Required Quantitation Limit *Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 2

Case #: 37813

SDG (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Field QC :											
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/26/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008	
Time Sampled :		19:13		09:18		10:40		10:56		10:19	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200		UL		UL		UL		UL		UL
BORON	50	539		114		14.0	J	18.3	J	18.3	J
CALCIUM	5000	37100		47100		52800		52300		48900	
IRON	100	290		4800		763		835		804	
MAGNESIUM	5000	45300		34600		2720	J	2700	J	2430	J
MOLYBDENUM	5										
MERCURY	0.2										
POTASSIUM	5000	28900		10700							
SODIUM	5000	633000	J	83700	J	8950	J	8720	J	8310	J

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Field QC :											
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/27/2008	8/27/2008	8/27/2008	8/27/2008	8/27/2008						
Time Sampled :	11:24	11:56	12:24	13:18	13:39						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200		UL		UL						
BORON	50	160		26.6	J	24.6	J	45.7	J	111	J
CALCIUM	5000	160000		118000		142000		64800		73800	
IRON	100	623		521		174		626		685	
MAGNESIUM	5000	14900		8650		8130		3790	J	5030	
MOLYBDENUM	5										
MERCURY	0.2										
POTASSIUM	5000	722	J	1170	J	868	J	1600	J	3010	J
SODIUM	5000	85600	J	19600	J	21800	J	17000	J	52900	J

CRQL = Contract Required Quantitation Limit *Action Level Exists

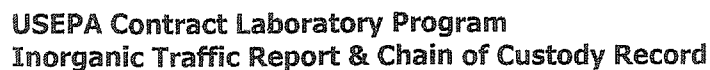
SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



37814 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	811 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	19:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	812 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	813 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	7:46		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	814 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	8:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	815 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	816 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	817 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:26		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	818 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:50		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	819 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:33		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	820 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	821 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)



37814-32913

13 CA R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record <table border="1"> <tr> <td colspan="2">Relinquished By</td> <td>(Date / Time)</td> <td>Sampler Signature: <i>Erik Armistead</i></td> </tr> <tr> <td>1.</td> <td></td> <td></td> <td>Received By</td> </tr> <tr> <td>2.</td> <td></td> <td></td> <td>(Date / Time)</td> </tr> <tr> <td>3.</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4.</td> <td></td> <td></td> <td></td> </tr> </table>	Relinquished By		(Date / Time)	Sampler Signature: <i>Erik Armistead</i>	1.			Received By	2.			(Date / Time)	3.				4.			
Relinquished By		(Date / Time)	Sampler Signature: <i>Erik Armistead</i>																					
1.			Received By																					
2.			(Date / Time)																					
3.																								
4.																								
Project Code:	CT4354	Carrier Name:	FedEx																					
Account Code:		Airbill:	961942977974,																					
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900																					
Spill ID:	ALM																							
Site Name/State:	Battlefield Golf/VA																							
Project Leader:	Erik Armistead																							
Action:	Preliminary Assessment																							
Sampling Co:	Tetra Tech EM Inc.																							

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	822 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	13:16 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	823 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	17:18 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	824 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	17:50 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	825 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	17:50 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	826 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	18:51 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	827 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	18:59 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	828 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	19:13 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	829 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	9:18 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	830 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	10:40 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	831 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	10:56 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	832 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	10:19 ✓	--	

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)



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R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	833 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	11:24 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	834 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	11:56 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	835 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	12:24 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	836 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	13:18 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	837 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	13:39 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	838 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	839 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:58		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	840 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	13:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	841 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	15:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	842 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	16:39		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	843 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	17:07		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT
DAS#		14
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: 1629.0 SDG No.: MC02E2SOW No.: ILM05.4

EPA Sample No.

Lab Sample ID

<u>MC02E2</u>	<u>Z4399-01</u>
<u>MC02E3</u>	<u>Z4399-02</u>
<u>MC02E4</u>	<u>Z4399-03</u>
<u>MC02E5</u>	<u>Z4399-04</u>
<u>MC02E6</u>	<u>Z4399-05</u>
<u>MC02E7</u>	<u>Z4399-06</u>
<u>MC02E8</u>	<u>Z4399-07</u>
<u>MC02E9</u>	<u>Z4399-08</u>
<u>MC02F0</u>	<u>Z4399-09</u>
<u>MC02F1</u>	<u>Z4399-10</u>
<u>MC02F2</u>	<u>Z4399-11</u>
<u>MC02F3</u>	<u>Z4399-12</u>
<u>MC02F4</u>	<u>Z4399-13</u>
<u>MC02F5</u>	<u>Z4399-14</u>
<u>MC02F6</u>	<u>Z4399-15</u>
<u>MC02F7</u>	<u>Z4399-16</u>
<u>MC02F8</u>	<u>Z4399-17</u>
<u>MC02F9</u>	<u>Z4399-18</u>
<u>MC02G0</u>	<u>Z4399-19</u>
<u>MC02G1</u>	<u>Z4399-20</u>
<u>MC02G1D</u>	<u>Z4399-21</u>
<u>MC02G1S</u>	<u>Z4399-22</u>

ICP-AES ICP-MS

Were ICP-AES and ICP-MS interelement corrections applied? (Yes/No) YES Were ICP-AES and ICP-MS background corrections applied? (Yes/No) YES If yes, were raw data generated before application of background corrections? (Yes/No) NO

Comments:

THE "E" QUALIFIERS ON FORM I AND VIII FOR SODIUM INDICATE CHEMICAL OR PHYSICAL INTERFERENCE EFFECTS.
WHICH WERE SUSPECTED DURING THAT ELEMENT'S ANALYSES ONLY.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4)
Date: 9/16/08Name: (b) (4)(b) (4)
Title: (b) (4)(b) (4)

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

SDG NARRATIVE

USEPA
SDG # MC02E2
CASE # 37813
CONTRACT # EPW06047
LAB NAME: CHEMTECH CONSULTING GROUP
LAB CODE: CHEM
CHEMTECH PROJECT #Z4399
MODIFIED ANALYSIS: 1629.0

A. Number of Samples and Date of Receipt

20 Water Samples were delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for ICP- AES Metals CLP12= (Al,Ca,Fe,Mg,K,Na)+B+MO & HG.

C. Cooler Temp

Indicator Bottle: Presence/Absence
Cooler: 4°C

D. Detail Documentation (related to Sample Handling Shipping, Analytical Problem, Temp of Cooler etc):

E. Corrective Action taken for above:

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-AES Water Sample:

Results reported in Ug/L = Results in ppm X 1000 X Dilution Factor (if any) X Fraction of Sample Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume and Final Volume made to 50 ml in ICP-AES Water Digestion procedure)

Calculation example for Hg Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample Amount Taken in Water Hg-Prep.

Fraction of Sample Amount Taken in Water Hg-Prep = $100/100 = 1$
(if 100 ml Initial Volume taken and made it to Final Volume as 100 ml)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements. Duplicate sample did meet requirements. Serial Dilution did meet requirements except for Sodium.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature (b) (4)
Date 9/16/08

Name: (b) (4)(b) (4)
Title: (b) (4)(b) (4)

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

Contractor Laboratory Acknowledgment Document

Analysis	Modification Reference Number	Hardcopy Turnaround Requirement	Preliminary Results (Y/N)	PDF Delivery (Y/N)	(A) Estimated No. of Samples by Matrix (including billable QC)	Cost For Modified Analysis	
						(B) New Per Sample Price	(A x B) Total Cost
ICP-AES 5-10 Metals (plus B and Mo)	1629.0	14 days	N	N	149 water	\$ _____	\$ _____
ICP-AES 11-22 Metals (plus B and Mo)	1629.0	14 days	N	N	28 water 39 soil	\$ _____	\$ _____
ICP-MS 11-16 Metals	N/A	14 days	N	N	149 water	\$ _____	\$ _____
Mercury	N/A	14 days	N	N	177 water 39 soil	\$ _____	\$ _____
						Total Project Cost	\$ _____

Project Information

Estimated Shipping Period:

8/29/2008 through 9/3/2008

Additional Information:

Please note that the samples will ship under two Cases.

Note: The requirements in the RFQ are as stated, and the Government will reduce the line item price listed on the bid sheet for late deliverables at a rate of 5 percent per calendar day late, up to a maximum of 50 percent. The Government will treat noncompliant data and late data for Preliminary Results in accordance with the terms and conditions of the contract, using the price listed on the bid sheet as the basis for the calculation.

Name of Contractor Laboratory: _____

Contract Number: _____

___ Laboratory AGREES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.

___ Laboratory DECLINES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.

Signature of Laboratory Representative: _____

Date: _____

Signature of USEPA Contracting Officer: _____

Date: _____

Analysis: Description of the analyses being requested by the USEPA for this Case. This column is completed by SMO.

Modification Reference Number: The numerical value assigned to the technical requirements describing the changes to the Statement of Work. This column is completed by SMO.

Hardcopy Turnaround Requirement: The analytical data turnaround time required for this Case. This column is completed by SMO.

Preliminary Results: Indicates if Preliminary Results are required for the line item. This column is completed by SMO.

PDF Delivery: Indicates if PDF Delivery is required for the line item. This column is completed by SMO.

Estimated No. of Samples and sample Matrix (including QC): The client's estimated number of samples (by matrix), including billable QC samples, to be collected and shipped to the laboratory. This column is completed by SMO.

New Per Sample Price: Laboratory's sample price for analyzing the samples identified in the line item. This column is completed by the laboratory.

Total Cost: This value is the Estimated No. of Samples (including QC) multiplied by the New Per Sample Price. This column is completed by the laboratory.

Total Project Cost: Sum of the total costs for all line items. This is completed by the laboratory.

SAMPLE LOG-IN SHEET

Lab Name CHEMTECH CONSULTING GROUP

Page 1 of 1

Received By (Print Name) (b) (4) (b) (4)		Log-in Date 9/3/2008				
Received By (Signature) (b) (4)						
Case Number 37813	Sample Delivery Group No. MC02E2	NRAS Number				
Remarks:		Corresponding				
		EPA Sample #	Aqueous Sample pH	Sample Tag #	Assigned Lab #	Remarks: Condition of Sample shipment, etc.
1. Custody Seal(s) <u>Present</u> /Absent* <u>Intact</u> /Broken		MC02E2	YA ↓	818	Z4399-01	INTACT
2. Custody Seal Nos. _____		MC02E3		820 819	Z4399-02	
3. Traffic Reports/Chain Of Custody Reports or Packing Lists <u>Present</u> /Absent*		MC02E4		820	Z4399-03	
4. Airbill <u>Airbill</u> /Sticker <u>Present</u> /Absent*		MC02E5		820 821	Z4399-04	
5. Airbill No. <u>961942977974</u>		MC02E6		822	Z4399-05	
6. Sample Tags <u>Present</u> /Absent* Sample Tag # <u>Listed</u> /Not Listed On TR/Chain-of-Custody		MC02E7		823	Z4399-06	
7. Sample Condition <u>Intact</u> /Broken*/Leaking		MC02E8		824	Z4399-07	
8. Cooler Temperature Indicator Bottle <u>Present</u> /Absent*		MC02E9		825	Z4399-08	
9. Cooler Temperature <u>4°C</u>		MC02F0		826	Z4399-09	
10. Does information on custody records, traffic reports, and sample tags agree? <u>Yes</u> /No*		MC02F1		827	Z4399-10	
11. Date Received at Lab <u>9-3-08</u>		MC02F2		828	Z4399-11	
12. Time Received <u>9:30</u>		MC02F3		829	Z4399-12	
Sample Transfer		MC02F4		830	Z4399-13	
		MC02F5		831	Z4399-14	
Fraction <u>METALS</u>		MC02F6		832	Z4399-15	
Area # <u>Q52</u>		MC02F7		833	Z4399-16	
By <u>CHRIS</u>		MC02F8		834	Z4399-17	
On <u>9-16-08</u>		MC02F9		835	Z4399-18	
		MC02G0		836	Z4399-19	
		MC02G1		837	Z4399-20	
		MC02G1D		837	Z4399-21	
		MC02G1S		837	Z4399-22	↓
* Contact SMO and attach record of resolution (b) (4)						
Reviewed By (b) (4)		Logbook No. (b) (4)				
Date <u>9-16-08</u>		Logbook Page No.				



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 2, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield ~~Golf~~ Club site (Case # 37813 SDG #MC02E3) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0985

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE



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US EPA Environmental Science Center
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Telephone 410-305-3037 Facsimile 410-305-3597

LOCKHEED MARTIN
We never forget who we're working for™



DATE: October 2, 2008

SUBJECT: Inorganic Data Validation (IM2 Level)
Case: 37813
SDG: MC02E3
Site: Battlefield Golf Club

FROM: (b) (4)(b) (4) (b) (4)
Inorganic Data Reviewer
(b) (4)(b) (4)(b) (4) (b) (4)
Senior Oversight Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02E3, consisted of twenty (20) aqueous samples analyzed for total metals by Chemtech Consulting Group (CHEM). The sample set included two (2) field duplicate pairs. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Samples in this SDG were analyzed by the ICP-MS method which does not include analysis for aluminum (Al), calcium (Ca), iron (Fe), magnesium (Mg), mercury (Hg), potassium (K) and sodium (Na). Hg was analyzed in SDG MC02E2 using a cold vapor technique. The remaining analytes were analyzed by the ICP-AES method for which the results are provided in separate SDG (MC02E2).

Data in this case have been impacted by outliers present in the laboratory blanks as well as the matrix spike analysis. Details of these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Continuing calibration (CCB) and/or preparation (PB) blanks had reported results greater than the Method Detection Limits (MDLs) for the analytes listed below. Positive results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) the blank concentrations may be biased high and have been qualified "B" on the DSFs.

<u>Blank</u>	<u>Affected Analytes</u>
--------------	--------------------------

CCB	antimony (Sb), arsenic (As), cadmium (Cd), chromium (Cr), lead (Pb), silver (Ag)
-----	--

PB	barium (Ba), cobalt (Co), nickel (Ni), vanadium (V)
----	---

CCBs had negative results greater than the absolute value of the MDL for selenium (Se). Quantitation limits for this analyte in affected samples may be biased low and have been qualified "UL" on the DSFs.

The matrix spike recovery was low ($<75\%$ but $>30\%$) for Ag. The low recovery may be attributed to matrix interferences or analyte lost during the digestion process. Positive results for this analyte in affected samples may be biased low. The "L" qualifier for this outlier has been superseded by "B" on the DSFs. Quantitation limits for this analyte in affected samples may be biased low and have been qualified "UL" on the DSFs.

NOTES

Reported results between MDLs and Contract Required Quantitation Limits (CRQLs) were qualified "J" on the DSFs unless superseded by "B".

The laboratory failed to submit raw data for concentration intensities to calculate the percent relative intensities (%RI) reported on Form XV, ICP-MS Internal Standards Relative Intensity Summary. However, all %RI reported on this form were inside the required limits of 60%-125%.

The laboratory failed to record the pH values of the samples on the Sample Log-In Sheet (Form DC-1) upon receipt. The chain of custody (COC) records indicate that the samples were preserved properly by the sampler. Additionally, the laboratory's preparation sheet for total metals analyses listed the pH as less than two (<2) prior to digestion. No data were qualified based on this finding.

The post-digestion spike recovery was high ($>125\%$) for Ag; however, data are not qualified based on the post-digestion spike recovery.

Reported results for field duplicate pair MC02E4/MC02E5 were within 20% RPD, \pm CRQL for all analytes except copper (Cu), Pb and zinc (Zn).

Reported results for field duplicate pair MC02E8/MC02E9 were within 20% RPD, \pm CRQL for all analytes except Cu.

Data for Case 37813, SDG MC02E3, were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLE 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORMS
APPENDIX C	CHAIN OF CUSTODY RECORDS
APPENDIX D	LABORATORY CASE NARRATIVE

DCN: 37813.MC02E3IM2.doc

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02E3

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	MC02E2, MC02E3, MC02E4, MC02E9	B		High	CCB (0.317 J µg/L)
	MC02F8	B		High	CCB (0.383 J µg/L)
As	MC02E2, MC02E3, MC02E4, MC02E6, MC02E8, MC02E9, MC02F0, MC02F1, MC02F4, MC02F5, MC02F6	B		High	CCB (0.303 J µg/L)
	MC02G0	B		High	CCB (0.270 J µg/L)
Ba	All Samples Except MC02E3, MC02E6, MC02F3, MC02F4, MC02F7, MC02F8, MC02F9	B		High	PB (1.143 J µg/L)
Cd	MC02E9, MC02F0, MC02F1, MC02F6, MC02F7	B		High	CCB (0.207 J µg/L)
	MC02F8, MC02F9	B		High	CCB (0.183 J µg/L)
Cr	MC02E9, MC02F0, MC02F1, MC02F3, MC02F4, MC02F5, MC02F6, MC02G1	B		High	CCB (0.183 J µg/L)

* See explanation of comments in Table 1B

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02E3

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Co	MC02E2, MC02E3, MC02E4, MC02E5, MC02E7, MC02E9, MC02F3	B		High	PB (0.200 J µg/L)
Pb	MC02E2	B		High	CCB (0.110 J µg/L)
	MC02F0, MC02F2, MC02F3	B		High	CCB (0.123 J µg/L)
Ni	MC02E2, MC02E4, MC02E6, MC02E8, MC02E9, MC02F0, MC02F1, MC02F2, MC02F3, MC02F6, MC02G1	B		High	PB (0.190 J µg/L)
Se	MC02E2, MC02E3, MC02E4, MC02E5, MC02E6, MC02E7, MC02E8		UL	Low	CBN (-0.330 J µg/L)
	MC02E9, MC02F0, MC02F1, MC02F3, MC02F4, MC02F5, MC02F6, MC02F7		UL	Low	CBN (-0.293 J µg/L)
	MC02F8, MC02F9, MC02G0, MC02G1		UL	Low	CBN (-0.407 J µg/L)
Ag	MC02E2, MC02E3, MC02E4, MC02E5	B		High	CCB (0.090 J µg/L) MSL (48%)

* See explanation of comments in Table 1B

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02E3

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Ag	MC02E9, MC02F0, MC02F1, MC02F8, MC02F9	B		High	CCB (0.093 J µg/L) MSL (48%)
	MC02E6, MC02E7, MC02E8, MC02F2, MC02F3, MC02F4, MC02F5, MC02F6, MC02F7, MC02G0, MC02G1		UL	Low	MSL (48%)
V	All Samples Except MC02E5, MC02E7, MC02F5, MC02F7, MC02G1	B		High	PB (0.243 J µg/L)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CCB	=	Continuing calibration blanks had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ the blank concentrations may be biased high.
PB	=	Preparation blank had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ the blank concentrations may be biased high.
CBN	=	Continuing calibration blanks had negative results with absolute values >MDLs [results are in parenthesis]. Quantitation limits may be biased low.
MSL	=	Matrix spike recovery was low (<75% but >30%) [% recovery is in parenthesis]. Positive results and quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 4

Case #: 37813

SDG : (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 20

Lab. :

CHEM

Sample Number :	(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		
Sampling Location :	(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		
Field QC :					Dup of (b) (6)		Dup of (b) (6)				
Matrix :	Water		Water		Water		Water		Water		
Units :	ug/L		ug/L		ug/L		ug/L		ug/L		
Date Sampled :	8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008		
Time Sampled :	10:50		11:33		11:26		11:26		13:16		
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	0.37	B	0.99	B	0.21	B				
*ARSENIC	1	1.4	B	1.3	B	1.4	B	1.6		1.5	B
BARIUM	10	1.7	B	11.4		1.5	B	1.3	B	10.2	
BERYLLIUM	1			0.11	J						
*CADMIUM	1										
*CHROMIUM	2	0.81	J	1.4	J	1.0	J	1.0	J	0.96	J
COBALT	1	0.20	B	0.21	B	0.14	B	0.11	B		
COPPER	2	2.6		246		8.4		63.3		24.4	
*LEAD	1	0.22	B	6.2		0.77	J	6.1		4.5	
MANGANESE	1	5.5		231		3.6		4.3		152	
*NICKEL	1	0.74	B	1.2		0.63	B	1.2		0.58	B
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1	0.063	B	0.083	B	0.040	B	0.037	B		UL
THALLIUM	1			0.11	J						
VANADIUM	5	1.2	B	1.1	B	1.0	B	1.3	J	0.88	B
ZINC	2	2.3		552		12.0		54.1		7.2	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 4

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Field QC :		Dup of (b) (6)	Dup of (b) (6)								
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/26/2008	8/26/2008	8/26/2008	8/26/2008	8/26/2008						
Time Sampled :	17:18	17:50	17:50	18:51	18:59						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2					0.21	B				
*ARSENIC	1	1.7		1.4	B	1.3	B	1.3	B	1.4	B
BARIUM	10	1.8	B	1.2	B	1.6	B	1.6	B	1.8	B
BERYLLIUM	1										
*CADMIUM	1					0.11	B	0.15	B	0.11	B
*CHROMIUM	2	1.1	J	0.71	J	0.74	B	0.76	B	0.76	B
COBALT	1	0.17	B			0.13	B				
COPPER	2	123		32.6		21.6		1.2	J	11.0	
*LEAD	1	18.6		1.9		1.4		0.12	B	0.77	J
MANGANESE	1	4.3		6.6		6.7		7.6		8.5	
*NICKEL	1	1.3		0.63	B	0.65	B	0.45	B	0.51	B
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL		UL	0.10	B	0.037	B	0.040	B
THALLIUM	1										
VANADIUM	5	1.5	J	0.69	B	1.2	B	0.71	B	0.78	B
ZINC	2	41.4		10.1		8.7		2.2		9.0	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 3 of 4

Case #: 37813

SDG: (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/26/2008	8/27/2008	8/27/2008	8/27/2008	8/27/2008						
Time Sampled :	19:13	09:18	10:40	10:56	10:19						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.9		1.6		1.5	B	1.5	B	1.5	B
BARIUM	10	4.0	B	29.4		6.7	J	5.6	B	5.4	B
BERYLLIUM	1										
*CADMIUM	1									0.12	B
*CHROMIUM	2	0.96	J	0.88	B	0.83	B	0.87	B	0.79	B
COBALT	1			0.11	B						
COPPER	2	2.4		1.3	J	129		58.5		37.5	
*LEAD	1	0.21	B	0.20	B	7.1		4.6		12.0	
MANGANESE	1	5.0		200		44.6		47.2		46.6	
*NICKEL	1	0.47	B	0.55	B	1.5		1.1		0.85	B
SELENIUM	5	3.6	J		UL		UL		UL		UL
SILVER	1		UL		UL		UL		UL		UL
THALLIUM	1										
VANADIUM	5	0.56	B	0.86	B	0.60	B	1.6	J	0.95	B
ZINC	2	3.4		3.5		82.0		44.7		14.4	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 4 of 4

Case #: 37813

SDG: (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/27/2008	8/27/2008	8/27/2008	8/27/2008	8/27/2008						
Time Sampled :	11:24	11:56	12:24	13:18	13:39						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2			0.23	B						
*ARSENIC	1	1.6		1.5		1.6		1.4	B	1.7	
BARIUM	10	44.1		22.2		14.2		3.0	B	1.9	B
BERYLLIUM	1										
*CADMIUM	1	0.13	B	0.16	B	0.10	B				
*CHROMIUM	2	1.5	J	0.99	J	1.1	J	0.93	J	0.83	B
COBALT	1										
COPPER	2	488		104		120		95.2		51.3	
*LEAD	1	7.4		7.7		8.7		17.9		1.7	
MANGANESE	1	484		127		154		9.2		5.3	
*NICKEL	1	5.5		1.8		138		1.0		0.90	B
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL	0.097	B	0.063	B		UL		UL
THALLIUM	1										
VANADIUM	5	1.7	J	1.1	B	1.0	B	1.2	B	1.7	J
ZINC	2	375		101		223		17.3		11.7	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)	
Spill ID:	ALM		284 Sheffield Street	
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092	
Project Leader:	Erik Armistead		(908) 789-8900	
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	811 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	19:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	812 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	813 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	7:46		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	814 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	8:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	815 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	816 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	9:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	817 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:26		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	818 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:50		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	819 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:33		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	820 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	821 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	11:26		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)



37814-32813

13 R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Sampler Signature: <i>Erik Armistead</i> Received By (Date / Time)
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)	
Spill ID:	ALM		284 Sheffield Street	
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092 (908) 789-8900	
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	822 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	13:16		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	823 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	17:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	824 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	17:50		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	825 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	17:50		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	826 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	18:51		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	827 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	18:59		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	828 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	19:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	829 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	9:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	830 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	10:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	831 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	10:56		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	832 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	10:19		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)

REGION CODE



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature:	<i>Erik Armistead</i>		
Project Code:	CT4354	Carrier Name:	FedEx		Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942977974,		1			
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900		2.			
Spill ID:	ALM				3.			
Site Name/State:	Battlefield Golf/VA			4.				
Project Leader:	Erik Armistead							
Action:	Preliminary Assessment							
Sampling Co:	Tetra Tech EM Inc.							

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	833 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	11:24		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	834 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	11:56		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	835 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	12:24		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	836 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	13:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	837 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	13:39		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	838 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	839 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	14:58		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	840 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/26/2008	13:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	841 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	15:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	842 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	16:39		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	843 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	17:07		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: _____ SDG No.: MC02E3SOW No.: ILM05.4

EPA Sample No.

MC02E2
MC02E3
MC02E4
MC02E5
MC02E6
MC02E7
MC02E8
MC02E9
MC02F0
MC02F1
MC02F2
MC02F3
MC02F4
MC02F5
MC02F6
MC02F7
MC02F8
MC02F9
MC02G0
MC02G1
MC02G1D
MC02G1S

Lab Sample ID

Z4425-02
Z4425-01
Z4425-03
Z4425-04
Z4425-05
Z4425-06
Z4425-07
Z4425-08
Z4425-09
Z4425-10
Z4425-11
Z4425-12
Z4425-13
Z4425-14
Z4425-15
Z4425-16
Z4425-17
Z4425-18
Z4425-19
Z4425-20
Z4425-21
Z4425-22

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	_____	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	_____	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	_____	<u>NO</u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature: **(b) (4)**

Signature: _____

Date: _____

Name: **(b) (4)(b) (4)**Title: **(b) (4)(b) (4)(b) (4)(b) (4)**

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

SDG NARRATIVE

USEPA
SDG # MC02E3
CASE # 37813
CONTRACT # EPW06047
LAB NAME: CHEMTECH CONSULTING GROUP
LAB CODE: CHEM
CHEMTECH PROJECT #Z4425

A. Number of Samples and Date of Receipt

20 Water Samples was delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for Metals CLP MS.

C. Cooler Temp

Indicator Bottle: Presence/Absence
Cooler: 4°C

D. Detail Documentation (related to Sample Handling Shipping, Analytical Problem, Temp of Cooler etc):

E. Corrective Action taken for above:

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-MS Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample
Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP-MS Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume
and Final Volume made to 50 ml in ICP-MS Water Digestion procedure)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements except for the Silver. Duplicate sample did meet requirements. Serial Dilution did meet requirements.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature _____ (b) (4)
Date _____ 9/16/08

Name: (b) (4)(b) (4)

Title: (b) (4)(b) (4)

parveen

From: (b) (4)(b) (4)(b) (4)(b) (4)
Sent: Thursday, September 04, 2008 11:13 AM
To: (b) (4)
Cc: slizys.dan@epa.gov; Harris.Carroll@epamail.epa.gov; thaung.khin-cho@epa.gov;
kwedar.john@epa.gov
Subject: Region 03 | Case 37813 | Lab CHEM | Issue Multiple | FINAL

(b) (4)

Summary Start

-Discrepancies with tags, jars, and/or TR/COC-

Issue 1: The TR/COC lists the analysis TAL TM+B+M for the ground, surface, and potable well water samples, however, the Scheduling Notification Form lists that the analysis is ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo/Hg, ICP-AES TM+B+Mo/Hg, and ICP-MS Metals for water samples. The laboratory is not sure what analyses should be performed on the water samples.

Resolution 1. Per Region 3, the laboratory will perform the following analyses on the water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

Matrix	Analysis
Ground Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Potable Well	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals

ICP-MS

Issue 2: The laboratory received several water samples that have a container labeled for Dissolved Metals; however, the laboratory is not scheduled to receive any Dissolved Metals samples.

Resolution 2. Per Region 3, the laboratory will perform the following analyses on the Dissolved Metals water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples

Matrix	Analysis (filtered)
Ground Water	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg

SMO will note that the laboratory accepted the laboratory's bid price of (b) (4) for ICP-AES 5-10 Metals (plus B and Mo), (b) (4) for ICP-AES 11-22 Metals (plus B and Mo), (b) (4) for ICP-MS 11-16 Metals, and (b) (4) for Mercury for the added Dissolved Metal fraction (bid sheet attached)

-Incorrect/duplicated sample numbers-

Issue 3: The laboratory received water samples that have the same Sample ID for the Total and Dissolved Metals fraction

Resolution 3. In accordance with previous direction from Region 3, the laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples using the following instructions: The Total Metals sample will keep the CLP sample ID listed on the TR/COC. The SMO coordinator will assign a new CLP sample ID for the Dissolved/Filtered Metals sample, and notify the Region and the laboratory of the new sample ID

Total Fraction	Dissolved Fraction
MC02A1	MC1GF1
MC02A2	MC1GF2
MC02A3	MC1GF3
MC02A4	MC1GF4

9/4/2008

708

MC02A5	MC1GF5
MC02A6	MC1GF6
MC02A7	MC1GF7
MC02A8	MC1GF8
MC02A9	MC1GF9
MC02B0	MC1GG0
MC02B1	MC1GG1
MC02B2	MC1GG2
MC02B3	MC1GG3
MC02B4	MC1GG4
MC02B5	MC1GG5
MC02B6	MC1GG6
MC02B7	MC1GG7
MC02B8	MC1GG8
MC02B9	MC1GG9

-Laboratory problems-

Issue 4: The laboratory received 2 containers for most of the soil samples received for the Case. The laboratory would like to perform the requested analyses from the 1st container and use the 2nd container as extra volume if needed. Are the laboratory's proposed actions acceptable to the Region?

Resolution 4: Per Region 3, the laboratory's proposed actions are acceptable. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

Summary End

Please let me know if you have any further questions or problems

Thanks,

(b) (4)

(b) (4)(b) (4)

Computer Sciences Corporation (CSC)

(b) (4)(b) (4)

(b) (4)(b) (4)(b) (4)

9/4/08, 11:45 AM, Phone conversation between Dan Slizys (Region 3) and (b) (4) (SMO). Dan indicated that the laboratory's proposed actions are acceptable for issue 4.

From: (b) (4)

Sent: Thursday, September 04, 2008 11:12 AM

To: 'slizys.dan@epa.gov'; Harris.Carroll@epamail.epa.gov

Cc: thaung.khin-cho@epa.gov; kwedar.john@epa.gov

Subject: NEW ISSUE | Case 37813 | Lab CHEM | Issue Multiple |

Dan/Carroll,

CHEM is reporting the following issues for Case 37813 (TR/COCs attached). Issues 1, 2, and 3 have been resolved. Please advise on issue 4.

-Discrepancies with tags, jars, and/or TR/COC-

Issue 1: The TR/COC lists the analysis TAL TM+B+M for the ground, surface, and potable well water samples; however, the Scheduling Notification Form lists that the analysis is ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo/Hg, ICP-AES TM+B+Mo/Hg, and ICP-MS Metals for water samples. The laboratory is not sure what analyses should be performed on the water samples.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 2, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case # 37813 SDG #MC02G2) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0987

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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

DATE: October 01, 2008

SUBJECT: Level IM2 Inorganic Data Validation for Case 37813
SDG: MC02G2
Site: Battlefield Golf Club

FROM: (b) (4)
Inorganic Data Reviewer

Through: (b) (4), (b) (4), (b) (4)
Senior Data Review Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02G2, consisted of twenty (20) aqueous samples analyzed by ICP-AES for aluminum (Al), boron (B), calcium (Ca), iron (Fe), magnesium (Mg), molybdenum (Mo), potassium (K), and sodium (Na). In addition, mercury (Hg) was analyzed in this SDG using a cold vapor technique. The sample set included no filed Quality Control (QC) samples. All samples were submitted to ChemTech Consulting Group (CHEM) for analyses. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 (Modified) through the Routine Analytical Services (RAS) program. Modifications included analysis of boron (B) at a Contract Required Quantitation Limit (CRQL) of 50 ug/L and molybdenum at 5.0 ug/L using modification reference number 1629.0

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Inorganic Data Review, level IM2. Areas of concern with respect to data usability are listed below.

Data in this Case have been impacted by outliers present in the laboratory blanks as well as the ICP serial dilution analysis. Details for these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Preparation (PB) and/or Continuing Calibration (CCBs) Blanks had negative results greater than the absolute values of the MDLs for the analytes listed below. Positive results reported for boron (B) in affected samples which are less than or equal to two times ($\leq 2X$) the absolute values of the blank concentrations may be biased low. The "L" qualifier for this analyte was superseded by "J" on the DSFs. Quantitation limits for these analytes in affected samples may be biased low and have been qualified "UL" on the DSFs.

<u>Blanks</u>	<u>Affected Analytes</u>
PB	Boron (B), molybdenum (Mo)
CCB	B, mercury (Hg)

Percent Differences (%Ds) for ICP serial dilution analysis were outside control limit ($>10\%$) for B and sodium (Na). Reported positive results for these analytes in affected samples are estimated and have been qualified "J" on the DSFs.

NOTES

Positive results which are less than the Contract Required Quantitation Limits (CRQLs) but greater than MDLs have been qualified "J" on the DSFs.

Data for Case 37813, SDG MC02G2, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses, April 1993.

ATTACHMENTS**INFORMATION REGARDING REPORT CONTENT**

TABLES 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLES 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORM(S)
APPENDIX C	CHAIN OF CUSTODY RECORD(S)
APPENDIX D	LABORATORY CASE NARRATIVE(S)

DCN: 37813_MC02G2.IM2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02G2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
B	MC02G2, MC02G4, MC02G5, MC02G6, MC02G8, MC02H0, MC02H1, MC02H2, MC02H3, MC02H8	J			SD (26%) CBN (– 30.455 J ug/L)
	MC02G7, MC02H6, MC02H7, MC02H9		UL	Low	PBN (– 10.725 J ug/L)
	MC02G3, MC02G9, MC02H4, MC02H5, MC02J0, MC02J1	J			SD (26%)
Mo	All Samples		UL	Low	PBN (– 1.470 J ug/L)
Hg	MC02H7, MC02H8, MC02H9, MC02J0, MC02J1		UL	Low	CBN (– 0.134 J ug/L)
Na	All samples Except MC02H7	J			SD (15%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

SD	=	Percent differences (%Ds) for the ICP serial dilution analysis were outside the (10%) control limit. [%Ds are in parenthesis]. Positive results are estimated.
CBN	=	Continuing calibration blanks had reported negative results greater than absolute value of MDLs [results are in parenthesis]. Reported results which are less than or equal to two times ($\leq 2X$) the absolute value of the blank and quantitation limits may be biased low.
PBN	=	The preparation blank had reported negative results greater than absolute value of MDLs [results are in parenthesis]. Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

- U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
- (NO CODE) = Confirmed identification.
- B = Not detected substantially above the level reported in laboratory or field blanks.
- R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

- J = Analyte Present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- UJ = Not detected, quantitation limit may be inaccurate or imprecise.
- UL = Not detected, quantitation limit is probably higher.

OTHER CODE

- Q = No analytical result.

Appendix B

Data Summary Forms (DSFs)

DATA SUMMARY FORM: INORGANIC

Page 1 of 2

Case #: 37813

SDG (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 20

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/27/2008		8/27/2008		8/26/2008		8/27/2008		8/27/2008	
Time Sampled :		14:21		14:58		13:20		15:20		16:39	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200										
BORON	50	20.1	J	95.4	J	46.8	J	11.7	J	46.5	J
CALCIUM	5000	135000		146000		49500		82000		65200	
IRON	100	830		565		350		7640		767	
MAGNESIUM	5000	9400		9000		3420	J	11800		3160	J
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2										
POTASSIUM	5000	636	J	2480	J	2810	J	1490	J	2910	J
SODIUM	5000	22500	J	63800	J	34500	J	30200	J	21200	J

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008	
Time Sampled :		17:07		17:15		18:18		19:30		19:20	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200										
BORON	50		UL	31.5	J	150	J	41.6	J	12.4	J
CALCIUM	5000	4840	J	65200		26800		52200		45200	
IRON	100	5850		550		150		349		305	
MAGNESIUM	5000	1400	J	3010	J	20000		4140	J	3620	J
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2										
POTASSIUM	5000	599	J	2310	J	15600		3980	J	3180	J
SODIUM	5000	6920	J	15600	J	133000	J	62000	J	36100	J

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 2

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/27/2008		8/25/2008		8/29/2008		8/28/2008		8/28/2008	
Time Sampled :		19:15		19:15		10:12		17:47		09:17	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200										
BORON	50	18.9	J	14.5	J	108	J	145	J		UL
CALCIUM	5000	43400		47000		27100		30200		89300	
IRON	100	322		343		157		240		1150	
MAGNESIUM	5000	4330	J	3590	J	14600		16400		4960	J
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2										
POTASSIUM	5000	3710	J	3140	J	10400		13100		857	J
SODIUM	5000	43600	J	41000	J	86400	J	153000	J	8980	J

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/26/2008		8/27/2008		8/27/2008		8/28/2008		8/28/2008	
Time Sampled :		10:13		15:41		16:13		09:45		10:23	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	17.9	J								
BORON	50		UL	32.3	J		UL	321	J	596	J
CALCIUM	5000			66300		1600	J	96100		103000	
IRON	100			4930		40.1	J	950		1140	
MAGNESIUM	5000			26600				10200		7910	
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2		UL		UL		UL		UL		UL
POTASSIUM	5000			8320		1000	J	3110	J	2540	J
SODIUM	5000			73600	J	327000	J	52900	J	44300	J

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	833 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	11:24		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	834 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	11:56		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	835 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	12:24		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	836 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	13:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	837 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	13:39		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	838 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	839 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:58		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	840 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	13:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	841 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	15:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	842 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	16:39		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	843 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	17:07		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)



37814 37813

13 (EA) R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	844 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	17:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	845 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	18:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	846 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	19:30		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	847 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	19:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	848 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	19:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	849 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	19:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	850 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	10:12		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	851 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	17:47		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	852 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	9:17		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	853 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	854 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	15:41		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)



37814 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Sampler Signature: <i>Erik Armistead</i> Received By (Date / Time)
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974.	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	855 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	16:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	856 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	9:45		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	857 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	10:23		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	858 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	10:29		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	859 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	860 (HNO3) (1)	(b) (6)(b) (6)(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	861 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	11:30		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	862 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	11:13		--
MC02J7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	863 (Ice Only), 864 (Ice Only) (2)	BG08-SS-MP01	S: 8/25/2008	10:18		--
MC02J8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	865 (Ice Only), 866 (Ice Only) (2)	BG08-SS-MP02	S: 8/25/2008	11:35		--
MC02J9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	867 (Ice Only), 868 (Ice Only) (2)	BG08-SS-MP03	S: 8/25/2008	12:15		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: 1629.0 SDG No.: MC02G2SOW No.: ILM05.4

EPA Sample No.

MC02G2
MC02G3
MC02G4
MC02G5
MC02G6
MC02G7
MC02G8
MC02G9
MC02H0
MC02H1
MC02H2
MC02H3
MC02H4
MC02H5
MC02H6
MC02H7
MC02H8
MC02H9
MC02J0
MC02J1
MC02J1D
MC02J1S

Lab Sample ID

Z4400-01
Z4400-02
Z4400-03
Z4400-04
Z4400-05
Z4400-06
Z4400-07
Z4400-08
Z4400-09
Z4400-10
Z4400-11
Z4400-12
Z4400-13
Z4400-14
Z4400-15
Z4400-16
Z4400-17
Z4400-18
Z4400-19
Z4400-20
Z4400-21
Z4400-22

ICP-AES ICP-MS

Were ICP-AES and ICP-MS interelement corrections applied? (Yes/No) YES _____Were ICP-AES and ICP-MS background corrections applied? (Yes/No) YES _____If yes, were raw data generated before application of background corrections? (Yes/No) NO _____

Comments:

THE "E" QUALIFIERS ON FORM I AND VIII FOR BORON AND SODIUM INDICATE CHEMICAL OR PHYSICAL INTERFERENCE EFFECTS, WHICH WERE SUSPECTED DURING THOSE ELEMENTS' ANALYSES ONLY.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

(b) (4)

Date: _____

9/16/08

Name: (b) (4)(b) (4)

Title: (b) (4)(b) (4)(b) (4)

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

SDG NARRATIVE

USEPA
SDG # MC02G2
CASE # 37813
CONTRACT # EPW06047
LAB NAME: CHEMTECH CONSULTING GROUP
LAB CODE: CHEM
CHEMTECH PROJECT #Z4400
MODIFIED ANALYSIS: 1629.0

A. Number of Samples and Date of Receipt

20 Water Samples were delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for ICP- AES Metals CLP12= (Al,Ca,Fe,Mg,K,Na)+B+MO & HG.

C. Cooler Temp

Indicator Bottle: Presence/Absence
Cooler: 4°C

D. Detail Documentation (related to Sample Handling Shipping, Analytical Problem, Temp of Cooler etc):

E. Corrective Action taken for above:

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH

284 Sheffield Street
Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-AES Water Sample:

Results reported in Ug/L = Results in ppm X 1000 X Dilution Factor (if any) X Fraction of Sample Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume and Final Volume made to 50 ml in ICP-AES Water Digestion procedure)

Calculation example for Hg Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample Amount Taken in Water Hg-Prep.

Fraction of Sample Amount Taken in Water Hg-Prep = $100/100 = 1$
(if 100 ml Initial Volume taken and made it to Final Volume as 100 ml)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements. Duplicate sample did meet requirements. Serial Dilution did meet requirements except for Boron and Sodium.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature _____

(b) (4)

Name: (b) (4)(b) (4)

Date _____

9/16/08

Title: (b) (4)(b) (4)

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

Contractor Laboratory Acknowledgment Document

Analysis	Modification Reference Number	Hardcopy Turnaround Requirement	Preliminary Results (Y/N)	PDF Delivery (Y/N)	(A) Estimated No. of Samples by Matrix (including billable QC)	Cost For Modified Analysis	
						(B) New Per Sample Price	(A x B) Total Cost
ICP-AES 5-10 Metals (plus B and Mo)	1629.0	14 days	N	N	149 water	\$ _____	\$ _____
ICP-AES 11-22 Metals (plus B and Mo)	1629.0	14 days	N	N	28 water 39 soil	\$ _____	\$ _____
ICP-MS 11-16 Metals	N/A	14 days	N	N	149 water	\$ _____	\$ _____
Mercury	N/A	14 days	N	N	177 water 39 soil	\$ _____	\$ _____
						Total Project Cost	\$ _____

Project Information

Estimated Shipping Period:

8/29/2008 through 9/3/2008

Additional Information:

Please note that the samples will ship under two Cases.

Note: The requirements in the RFQ are as stated, and the Government will reduce the line item price listed on the bid sheet for late deliverables at a rate of 5 percent per calendar day late, up to a maximum of 50 percent. The Government will treat noncompliant data and late data for Preliminary Results in accordance with the terms and conditions of the contract, using the price listed on the bid sheet as the basis for the calculation.

Name of Contractor Laboratory: _____

Contract Number: _____

____ Laboratory AGREES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.

____ Laboratory DECLINES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.

Signature of Laboratory Representative: _____

Date: _____

Signature of USEPA Contracting Officer: _____

Date: _____

Analysis: Description of the analyses being requested by the USEPA for this Case. This column is completed by SMO.

Modification Reference Number: The numerical value assigned to the technical requirements describing the changes to the Statement of Work. This column is completed by SMO.

Hardcopy Turnaround Requirement: The analytical data turnaround time required for this Case. This column is completed by SMO.

Preliminary Results: Indicates if Preliminary Results are required for the line item. This column is completed by SMO.

PDF Delivery: Indicates if PDF Delivery is required for the line item. This column is completed by SMO.

Estimated No. of Samples and sample Matrix (including QC): The client's estimated number of samples (by matrix), including billable QC samples, to be collected and shipped to the laboratory. This column is completed by SMO.

New Per Sample Price: Laboratory's sample price for analyzing the samples identified in the line item. This column is completed by the laboratory.

Total Cost: This value is the Estimated No. of Samples (including QC) multiplied by the New Per Sample Price. This column is completed by the laboratory.

Total Project Cost: Sum of the total costs for all line items. This is completed by the laboratory.

SAMPLE LOG-IN SHEET

Lab Name CHEMTECH CONSULTING GROUP

Page 1 of 1

Received By (Print Name) (b) (4) (b) (4)		Log-in Date 9/3/2008		
Received By (Signature) (b) (4)(b) (4)				
Case Number 37813	Sample Delivery Group No. MC02G2	NRAS Number		
Remarks:		Corresponding		
1. Custody Seal(s) <u>Present</u> /Absent* Intact/Broken	EPA Sample # Aqueous Sample pH MC02G2 N/A MC02G3 MC02G4 MC02G5 MC02G6 MC02G7 MC02G8 MC02G9 MC02H0 MC02H1 MC02H2 MC02H3 MC02H4 MC02H5 MC02H6 MC02H7 MC02H8 MC02H9 MC02J0 MC02J1 MC02J1D MC02J1S	Sample Tag #	Assigned Lab #	
2. Custody Seal Nos. _____				
3. Traffic Reports/Chain Of Custody Reports or Packing Lists <u>Present</u> /Absent*		7 838	Z4400-01	
4. Airbill <u>Airbill</u> Sticker <u>Present</u> /Absent*		7 839	Z4400-02	
5. Airbill No. <u>961942977974</u>		7 840	Z4400-03	
6. Sample Tags Sample Tag # <u>Present</u> /Absent* <u>Listed</u> /Not Listed On TR/Chain-of-Custody		7 841	Z4400-04	
7. Sample Condition <u>Intact</u> /Broken*/Leaking		7 842	Z4400-05	
8. Cooler Temperature Indicator Bottle <u>Present</u> /Absent*		7 843	Z4400-06	
9. Cooler Temperature <u>4°C</u>		7 844	Z4400-07	
10. Does information on custody records, traffic reports, and sample tags agree? <u>Yes</u> /No*		7 845	Z4400-08	
11. Date Received at Lab <u>9.3.08</u>		7 846	Z4400-09	
12. Time Received <u>9:30 AM</u>		7 847	Z4400-10	
Sample Transfer		7 848	Z4400-11	
Fraction <u>METALS</u>		Fraction <u>CL</u>	7 849	Z4400-12
Area # <u>Q52</u>		Area # <u>CL</u>	7 850	Z4400-13
By <u>CHRS</u>		By <u>CL</u>	7 851	Z4400-14
On <u>9.15.08</u>		On <u>CL</u>	7 852	Z4400-15
			7 853	Z4400-16
			7 854	Z4400-17
			7 855	Z4400-18
			7 856	Z4400-19
			7 857	Z4400-20
		7 857	Z4400-21	
		7 857	Z4400-22	
* Contact SMO and attach record of resolution				
Reviewed By (b) (4)(b) (4)	Logbook No. (b) (4)			
Date <u>9.15.08</u>	Logbook Page No. (b) (4)			

FORM DC-1

ILM05.3

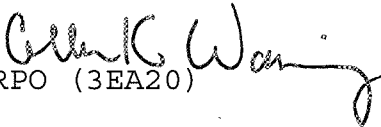
4



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 2, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling 
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case # 37813 SDG #MC02G3) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0986

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE



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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

LOCKHEED MARTIN
We never forget who we're working for™

Date: October 2, 2008

Subject: Inorganic Data Validation (IM2 Level)
Case: 37813
SDG : MC02G3
Site : Battlefield Golf Club

From: (b) (4) (b) (4)
Inorganic Data Reviewer
(b) (4)(b) (4)(b) (4) (b) (4)
Senior Oversight Chemist

To: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02G3, consisted of twenty (20) aqueous samples analyzed for selected total metals. Samples were analyzed by ChemTech Consulting Group (CHEM) according to the Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by outliers present in the laboratory blanks and matrix spike analyses. Details of these outliers are discussed under "Minor Problems," specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Continuing calibration blanks (CCBs) had reported results greater than the Method Detection Limits (MDLs) for antimony (Sb), cadmium (Cd), chromium (Cr), lead (Pb), silver (Ag), thallium (Tl) and vanadium (V). Positive results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) blank concentrations may be biased high and have been qualified "B" on the DSFs.

A CCB had a negative result greater than the absolute value of the MDL for selenium (Se). Quantitation limits for this analyte in affected samples may be biased low and have been qualified "UL" on the DSFs.

The matrix spike recovery was low (<75% but >30%) for Ag. Low recoveries may be attributed to matrix interferences or analyte lost during the digestion process. The "L" qualifier for positive results for Ag was superseded by "B" on the DSFs. Quantitation limits for this analyte may be biased low and have been qualified "UL" on the DSFs.

NOTES

The post digestion spike analysis reported a recovery of 131% for Ag; however, data are not qualified based on the post-digestion spike recovery.

Reported results between MDLs and Contract Required Quantitation Limits (CRQLs) were qualified "J" unless superseded by "B" on the DSFs.

Data for Case 37813, SDG MC02G3, were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

Table 1A	Summary of qualifiers on data summary forms after data validation
Table 1B	Codes used in comments column of Table 1A
Appendix A	Glossary of Data Qualifier Codes
Appendix B	Data Summary Form(s)
Appendix C	Chain of Custody Records
Appendix D	Laboratory Case Narrative

DCN: 37813_MC02G3

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02G3

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	MC02G2, MC02G3, MC02G5	B		High	CCB (0.310 J ug/L)
Cd	MC02G5, MC02G7, MC02H0, MC02H2	B		High	CCB (0.180 Jug/L)
	MC02H6, MC02H7	B		High	CCB (0.177 J ug/L)
Cr	MC02H3	B		High	CCB (0.107 J ug/L)
	MC02H6	B		High	CCB (0.107 J ug/L)
Pb	MC02G2	B		High	CCB (0.100 J ug/L)
Se	MC02H5, MC02H6, MC02H7, MC02H8, MC02H9, MC02J0, MC02J1		UL	Low	CBN (-0.330 J ug/L)
Ag	MC02G2, MC02G3	B		High	CCB (0.093 J ug/L) MSL (48%)
	MC02G5, MC02G6, MC02H0	B		High	CCB (0.090 J ug/L) MSL (48%)
	MC02H5, MC02H6	B		High	CCB (0.090 J ug/L) MSL (48%)
	MC02G4, MC02G7, MC02G8, MC02G9, MC02H1, MC02H2, MC02H3, MC02H4, MC02H7, MC02H8, MC02H9, MC02J0, MC02J1		UL	Low	MSL (48%)
Tl	MC02G3	B		High	CCB (0.163 J ug/L)

* See explanation of comments in Table 1B

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02G3

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
V	MC02G2, MC02G3, MC02G4, MC02G5, MC02G6, MC02G7, MC02G8, MC02G9, MC02H0, MC02H1, MC02H2, MC02H3, MC02H4	B		High	CCB (0.350 J ug/L)
	MC02H5, MC02H6, MC02H8, MC02H9, MC02J0, MC02J1	B		High	CCB (0.270 J ug/L)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CCB	=	Continuing calibration blanks had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ the blank concentrations may be biased high.
CBN	=	Continuing calibration blank had a negative result with absolute value > MDL [results are in parenthesis]. Quantitation limits may be biased low.
MSL	=	Matrix Spike recovery was low (<75% but >30%) [percent recovery is in parenthesis]. Positive results and quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 4

Case #: 37813

SDG : (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 20

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/27/2008		8/27/2008		8/26/2008		8/27/2008		8/27/2008	
Time Sampled :		14:21		14:58		13:20		15:20		16:39	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	0.40	B	1.1	B			0.22	B		
*ARSENIC	1	1.7		1.8		1.6		1.7		1.5	
BARIUM	10	36.0		21.1		2.8	J	9.9	J	1.7	J
BERYLLIUM	1							0.10	J		
*CADMIUM	1							0.10	B		
*CHROMIUM	2	1.1	J	1.4	J	0.74	J	0.75	J	0.64	J
COBALT	1							1.1		0.11	J
COPPER	2	5.7		88.9		12.7		17.5		10.3	
*LEAD	1	0.27	B	2.4		2.0		1.3		0.20	J
MANGANESE	1	165		169		11.1		232		6.9	
*NICKEL	1	2.4		2.6		0.80	J	1.7		0.68	J
SELENIUM	5										
SILVER	1	0.037	B	0.083	B		UL	0.097	B	0.043	B
THALLIUM	1			0.12	B						
VANADIUM	5	1.0	B	1.1	B	1.3	B	1.2	B	1.2	B
ZINC	2	61.7		24.6		12.4		13.8		2.6	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 4

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008	
Time Sampled :		17:07		17:15		18:18		19:30		19:20	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.3		1.3		1.4		1.5		1.4	
BARIUM	10	9.3	J	1.6	J	1.9	J	5.6	J	1.7	J
BERYLLIUM	1										
*CADMIUM	1	0.10	B					0.26	B		
*CHROMIUM	2	0.74	J	0.67	J	0.64	J	0.72	J	1.1	J
COBALT	1	0.33	J							0.12	J
COPPER	2	76.0		10.1		6.4		80.5		2.1	
*LEAD	1	6.0		0.54	J	2.0		6.3		0.22	J
MANGANESE	1	112		5.9		8.4		11.1		10.2	
*NICKEL	1	0.47	J	0.78	J	0.89	J	1.7		0.55	J
SELENIUM	5										
SILVER	1		UL		UL		UL	0.040	B		UL
THALLIUM	1										
VANADIUM	5	1.5	B	1.1	B	0.63	B	1.2	B	1.3	B
ZINC	2	42.3		3.4		7.3		71.5		3.3	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 3 of 4

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :	(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)		
Sampling Location :	(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		
Matrix :	Water		Water		Water		Water		Water		
Units :	ug/L		ug/L		ug/L		ug/L		ug/L		
Date Sampled :	8/27/2008		8/25/2008		8/29/2008		8/28/2008		8/28/2008		
Time Sampled :	19:15		19:15		10:12		17:47		09:17		
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.4		1.3		1.5		1.6		1.4	
BARIUM	10	1.4	J	1.5	J	1.1	J	1.7	J	15.0	
BERYLLIUM	1										
*CADMIUM	1	0.10	B							0.12	B
*CHROMIUM	2	0.57	J	0.52	B	0.57	J	0.65	J	0.52	B
COBALT	1							0.12	J		
COPPER	2	97.1		9.3		22.5		39.5		87.9	
*LEAD	1	18.9		0.49	J	1.9		2.2		7.2	
MANGANESE	1	9.4		9.4		4.3		4.4		145	
*NICKEL	1	1.1		0.54	J	0.67	J	0.62	J	1.3	
SELENIUM	5								UL		UL
SILVER	1		UL		UL		UL	0.087	B	0.043	B
THALLIUM	1										
VANADIUM	5	1.1	B	0.90	B	0.69	B	1.0	B	1.2	B
ZINC	2	66.5		11.6		28.1		30.2		73.2	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 4 of 4

Case #: 37813

SDG : (b) (6)

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Total Metals

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/26/2008		8/27/2008		8/27/2008		8/28/2008		8/28/2008	
Time Sampled :		10:13		15:41		16:13		09:45		10:23	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	2.6		1.5		1.5		1.6		1.6	
BARIUM	10	59.0		33.0		0.50	J	47.8		30.9	
BERYLLIUM	1	0.51	J								
*CADMIUM	1	0.16	B								
*CHROMIUM	2	0.99	J	0.69	J	0.75	J	0.63	J	0.71	J
COBALT	1	8.7				0.11	J				
COPPER	2	55.3		15.6		148		16.4		24.3	
*LEAD	1	12.2		0.67	J	11.8		1.0		2.1	
MANGANESE	1	102		178		2.4		238		166	
*NICKEL	1	8.1		0.66	J	0.82	J	2.2		2.8	
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL		UL		UL		UL		UL
THALLIUM	1										
VANADIUM	5	2.4	J	0.76	B	0.75	B	0.87	B	1.2	B
ZINC	2	40.0		18.4		16.9		8.4		38.7	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain of Custody Records

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			



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Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Sampler Signature: <i>Erik Armistead</i> Received By (Date / Time)
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	844 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	17:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	845 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	18:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	846 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	19:30		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	847 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	19:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	848 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	19:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	849 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/25/2008	19:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	850 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/29/2008	10:12		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	851 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	17:47		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	852 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	9:17		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	853 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/26/2008	10:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	854 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	15:41		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

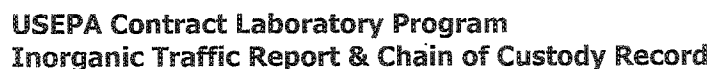
TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)

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Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature:	<i>Erik Armistead</i>	
Project Code:	CT4354	Carrier Name:	FedEx		Relinquished By	(Date / Time)	Received By
Account Code:		Airbill:	961942977974,	1.			
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	2.			
Spill ID:	ALM			3.			
Site Name/State:	Battlefield Golf/VA			4.			
Project Leader:	Erik Armistead						
Action:	Preliminary Assessment						
Sampling Co:	Tetra Tech EM Inc.						

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	833 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	11:24		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	834 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	11:56		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	835 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	12:24		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	836 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	13:18		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	837 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	13:39		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	838 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	839 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:58		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	840 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	13:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	841 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	15:20		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	842 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	16:39		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	843 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	17:07		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

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R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature:	<i>Erik Armistead</i>		
Project Code:	CT4354	Carrier Name:	FedEx		Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942977974,		1			
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900		2.			
Spill ID:	ALM				3.			
Site Name/State:	Battlefield Golf/VA			4.				
Project Leader:	Erik Armistead							
Action:	Preliminary Assessment							
Sampling Co:	Tetra Tech EM Inc.							

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	855 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	16:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	856 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	9:45		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	857 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	10:23		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	858 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	10:29		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	859 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	860 (HNO3) (1)	(b) (6)(b) (6)(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	861 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	11:30		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	862 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	11:13		--
MC02J7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	863 (Ice Only), 864 (Ice Only) (2)	BG08-SS-MP01	S: 8/25/2008	10:18		--
MC02J8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	865 (Ice Only), 866 (Ice Only) (2)	BG08-SS-MP02	S: 8/25/2008	11:35		--
MC02J9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	867 (Ice Only), 868 (Ice Only) (2)	BG08-SS-MP03	S: 8/25/2008	12:15		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)

F2V5.1.047 Page 8 of 10

REGIONAL 2000

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: _____ SDG No.: MC02G3SOW No.: ILM05.4

EPA Sample No.

MC02G2
MC02G3
MC02G4
MC02G5
MC02G6
MC02G7
MC02G8
MC02G9
MC02H0
MC02H1
MC02H2
MC02H3
MC02H4
MC02H5
MC02H6
MC02H7
MC02H8
MC02H9
MC02J0
MC02J1
MC02J1D
MC02J1S

Lab Sample ID

Z4426-02
Z4426-01
Z4426-03
Z4426-04
Z4426-05
Z4426-06
Z4426-07
Z4426-08
Z4426-09
Z4426-10
Z4426-11
Z4426-12
Z4426-13
Z4426-14
Z4426-15
Z4426-16
Z4426-17
Z4426-18
Z4426-19
Z4426-20
Z4426-21
Z4426-22

	ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No) _____	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No) _____	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No) _____	<u>NO</u>

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

Date: _____

Name: (b) (4)(b) (4)Title: (b) (4)(b) (4)(b) (4)(b) (4)

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

SDG NARRATIVE

USEPA

SDG # MC02G3

CASE # 37813

CONTRACT # EPW06047

LAB NAME: CHEMTECH CONSULTING GROUP

LAB CODE: CHEM

CHEMTECH PROJECT #Z4426

A. Number of Samples and Date of Receipt

20 Water Samples was delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for Metals CLP MS.

C. Cooler Temp

Indicator Bottle: Presence/Absence

Cooler: 4°C

**D. Detail Documentation (related to Sample Handling
Shipping, Analytical Problem, Temp of Cooler etc):****E. Corrective Action taken for above:****F. Analytical Techniques:**

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-MS Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample
Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP-MS Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume
and Final Volume made to 50 ml in ICP-MS Water Digestion procedure)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements except for the Silver. Duplicate sample did meet requirements. Serial Dilution did meet requirements.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature _____

(b) (4)

Name: (b) (4)(b) (4)

Date _____

9/16/08

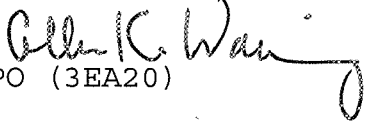
Title: (b) (4)(b) (4)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 2, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling 
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case # 37813 SDG #MC02J2) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0983

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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

DATE: October 1, 2008

SUBJECT: Level IM2 Inorganic Data Validation for Case 37813
SDG: MC02J2
Site: Battlefield Golf Club

FROM: (b) (4)
Inorganic Data Reviewer

Through: (b) (4)(b) (4)(b) (4) (b) (4)
Senior Data Review Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02J2, consisted of six (6) aqueous samples analyzed for aluminum (Al), boron (B), calcium (Ca), iron (Fe), magnesium (Mg), mercury (Hg) molybdenum (Mo), potassium (K), and sodium (Na). The sample set included one (1) filed duplicate pair. All samples were submitted to ChemTech Consulting Group (CHEM) for analyses. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 (Modified) through the Routine Analytical Services (RAS) program. Modifications included analysis of B at a Contract Required Quantitation Limit (CRQL) of 50 ug/L and Mo 5.0 ug/L using modification reference number 1629.0.

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Inorganic Data Review, level IM2. Areas of concern with respect to data usability are listed below.

Data in this Case have been impacted by outliers present in the laboratory blanks as well as the ICP serial dilution analysis. Details for these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on a single Data Summary Form (DSF).

MINOR PROBLEMS

The Preparation Blank (PB) for B and the Continuing Calibration Blank (CCB) for Hg had negative values greater than the absolute value of the Method Detection Limits (MDLs). The positive result reported for B in affected sample MC02J6 which is less than two times (<2X) the absolute value of the blank concentration may be biased low. The "L" qualifier for this outlier has been superseded by "J" on the DSF. Quantitation limits for Hg in all samples may be biased low and have been qualified "UL" on the DSF.

The Percent Difference (%D) for the ICP serial dilution analysis was outside the control limit (>10%) for sodium (Na). Reported results for this analyte in all samples are estimated and have been qualified "J" on the DSF.

NOTES

Positive results which are less than the Contract Required Quantitation Limits (CRQLs) but greater than MDLs have been qualified "J" on the DSF.

The laboratory failed to report sample pH values on DC-1 Form.

One (1) CRQL check standard was below the lower control limit for Hg. This standard was immediately analyzed with acceptable recovery. No data were impacted.

Results for the field duplicate pair, samples MC02J3/MC02J4, were within \pm CRQL, 20% RPD for all analytes.

Data for Case 37813, SDG MC02J2, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses, April 1993.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

TABLES 1A SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER
DATA VALIDATION
TABLE 1B CODES USED IN COMMENTS COLUMN OF TABLES 1A
APPENDIX A GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B DATA SUMMARY FORM(S)
APPENDIX C CHAIN OF CUSTODY RECORD(S)
APPENDIX D LABORATORY CASE NARRATIVE(S)

DCN: 37813_MC02J2. IM2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02J2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
B	MC02J6	J			> MDL < CRQL PBN (– 43.255 J ug/L)
Hg	All Samples		UL	Low	CBN (– 0.072 J ug/L)
Na	All samples	J			SD (24%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

MDL <CRQL	=	Reported results are between MDL and CRQL and are considered estimated.
PBN	=	The preparation blank had a reported negative result greater than absolute value of MDL [the result is in parenthesis]. The reported result which is less than or equal to two times ($\leq 2X$) the absolute value of the blank may be biased low.
CBN	=	The continuing calibration blank had a reported negative result greater than absolute value of MDL [the result is in parenthesis]. Quantitation limits may be biased low.
SD	=	Percent difference (%D) for ICP serial dilution analysis was outside the control limits (10%), (%D is in parenthesis). Positive results are estimated.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

- U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.
- (NO CODE) = Confirmed identification.
- B = Not detected substantially above the level reported in laboratory or field blanks.
- R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

- J = Analyte Present. Reported value may not be accurate or precise.
- K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- UJ = Not detected, quantitation limit may be inaccurate or imprecise.
- UL = Not detected, quantitation limit is probably higher.

OTHER CODE

- Q = No analytical result.

Appendix B

Data Summary Forms (DSFs)

DATA SUMMARY FORM: INORGANIC

Page 1 of 1

Case #: 37813

SDG (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 6

Lab. :

CHEM

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)
Field QC					
Matrix :	Water	Water	Water	Water	Water
Units :	ug/L	ug/L	ug/L	ug/L	ug/L
Date Sampled :	8/25/2008	8/28/2008	8/29/2008	8/29/2008	8/29/2008
Time Sampled :	09:27	10:29	11:19	11:19	11:30
Dilution Factor :	1.0	1.0	1.0	1.0	1.0
ANALYTE	CRQL	Result	Flag	Result	Flag
ALUMINUM	200				
BORON	50	193		380	
CALCIUM	5000	25300		116000	
IRON	100	156		778	
MAGNESIUM	5000	16400		8380	
MOLYBDENUM	5				
MERCURY	0.2		UL		UL
POTASSIUM	5000	12800		3490	J
SODIUM	5000	145000	J	42200	J

Sample Number :	(b) (6)				
Sampling Location :	(b) (6)(b) (6)				
Matrix :	Water				
Units :	ug/L				
Date Sampled :	8/28/2008				
Time Sampled :	11:13				
Dilution Factor :	1.0				
ANALYTE	CRQL	Result	Flag	Result	Flag
ALUMINUM	200				
BORON	50	4.4	J		
CALCIUM	5000	37800			
IRON	100	17300			
MAGNESIUM	5000	22600			
MOLYBDENUM	5				
MERCURY	0.2		UL		
POTASSIUM	5000	2260	J		
SODIUM	5000	64700	J		

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



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R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature:	<i>Erik Armistead</i>	
Project Code:	CT4354	Carrier Name:	FedEx		Relinquished By	(Date / Time)	Received By
Account Code:		Airbill:	961942977974,	1.			
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	2.			
Spill ID:	ALM			3.			
Site Name/State:	Battlefield Golf/VA			4.			
Project Leader:	Erik Armistead						
Action:	Preliminary Assessment						
Sampling Co:	Tetra Tech EM Inc.						

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02B2 MC16-2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 902 (HNO3) (2)	BG08-GW-MP12	S: 8/28/2008	13:05		need 9/17/08 dep
MC02B3 MC16-3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 903 (HNO3) (2)	BG08-GW-MP13	S: 8/28/2008	13:25		need 9/17/08 dep
MC02B4 MC16-4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 904 (HNO3) (2)	BG08-GW-MW01	S: 8/29/2008	15:55		need 9/17/08 dep
MC02B5 MC16-5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 905 (HNO3) (2)	BG08-GW-MW02	S: 8/29/2008	13:50		need 9/17/08 dep
MC02B6 MC16-6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 906 (HNO3) (2)	BG08-GW-MW02D	S: 8/29/2008	13:50		need 9/17/08 dep
MC02B7 MC16-7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 907 (HNO3) (2)	BG08-GW-MW03	S: 8/29/2008	14:50		need 9/17/08 dep
MC02B8 MC16-8	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 908 (HNO3) (2)	BG08-SW-SW01	S: 8/29/2008	12:51		need 9/17/08 dep
MC02B9 MC16-9	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 909 (HNO3) (2)	BG08-SW-SW02	S: 8/29/2008	15:40		need 9/17/08 dep
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	796 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:27		need 9/17/08 dep
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	9:59		need 9/17/08 dep
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	798 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	16:45		need 9/17/08 dep

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM-B+M = TAL Diss Metals+Boron+Moly. TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By	(Date / Time)
Account Code:		Airbill:	961942977974,	1	<i>Erik Armistead</i> 9/2/08 1700
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)	2.	
Spill ID:	ALM		284 Sheffield Street	3.	
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092	4.	
Project Leader:	Erik Armistead		(908) 789-8900		
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02A1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	777 (HNO3), 891 (HNO3) (2)	BG08-GW-MP01	S: 8/28/2008	12:40		--
MC02A2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	778 (HNO3), 892 (HNO3) (2)	BG08-GW-MP02	S: 8/29/2008	11:15		--
MC02A3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	779 (HNO3), 893 (HNO3) (2)	BG08-GW-MP03	S: 8/29/2008	10:00		--
MC02A4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	780 (HNO3), 894 (HNO3) (2)	BG08-GW-MP04	S: 8/28/2008	14:06		--
MC02A5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	781 (HNO3), 895 (HNO3) (2)	BG08-GW-MP05	S: 8/28/2008	15:50		--
MC02A6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	782 (HNO3), 896 (HNO3) (2)	BG08-GW-MP06	S: 8/28/2008	17:47		--
MC02A7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	783 (HNO3), 897 (HNO3) (2)	BG08-GW-MP07	S: 8/28/2008	18:10		--
MC02A8	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	784 (HNO3), 898 (HNO3) (2)	BG08-GW-MP08	S: 8/29/2008	9:10		--
MC02A9	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	785 (HNO3), 899 (HNO3) (2)	BG08-GW-MP09	S: 8/29/2008	10:50		--
MC02B0	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	786 (HNO3), 900 (HNO3) (2)	BG08-GW-MP10	S: 8/29/2008	11:50		--
MC02B1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	787 (HNO3), 901 (HNO3) (2)	BG08-GW-MP11	S: 8/28/2008	13:48		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Sampler Signature: <i>Erik Armistead</i> Received By (Date / Time)
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)	
Spill ID:	ALM		284 Sheffield Street	
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092	
Project Leader:	Erik Armistead		(908) 789-8900	
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	855 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	16:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	856 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	9:45		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	857 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	10:23		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	858 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	10:29		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	859 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	860 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	861 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/29/2008	11:30		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	862 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	11:13		--
MC02J7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	863 (Ice Only), 864 (Ice Only) (2)	BG08-SS-MP01	S: 8/25/2008	10:18		--
MC02J8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	865 (Ice Only), 866 (Ice Only) (2)	BG08-SS-MP02	S: 8/25/2008	11:35		--
MC02J9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	867 (Ice Only), 868 (Ice Only) (2)	BG08-SS-MP03	S: 8/25/2008	12:15		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)

F2V5.1.047 Page 8 of 10

U.S. EPA Region III Analytical Request Form

JTS 8-15-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
		Date Approved: 8/20/2008	
EPA Project Leader: CHRIS WAGNER	Phone#:	Cell Phone #: 804-337-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOSHUA COPE	Phone#: 610-364-2130	Cell Phone #: 215-768-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK ARMISTEAD	Phone#: 610-364-2151	Cell Phone #: 267 446 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

SDG NARRATIVE

USEPA

SDG # MC02J2

CASE # 37813

CONTRACT # EPW06047

LAB NAME: CHEMTECH CONSULTING GROUP

LAB CODE: CHEM

CHEMTECH PROJECT #Z4423

MODIFIED ANALYSIS: 1629.0

A. Number of Samples and Date of Receipt

6 Water Samples were delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for ICP- AES Metals CLP12= (Al,Ca,Fe,Mg,K,Na)+B+MO & HG.

C. Cooler Temp

Indicator Bottle: Presence/Absence

Cooler: 4°C

**D. Detail Documentation (related to Sample Handling
Shipping, Analytical Problem, Temp of Cooler etc):**

E. Corrective Action taken for above:

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-AES Water Sample:

Results reported in Ug/L = Results in ppm X 1000 X Dilution Factor (if any) X Fraction of Sample Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume and Final Volume made to 50 ml in ICP-AES Water Digestion procedure)

Calculation example for Hg Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample Amount Taken in Water Hg-Prep.

Fraction of Sample Amount Taken in Water Hg-Prep = $100/100 = 1$
(if 100 ml Initial Volume taken and made it to Final Volume as 100 ml)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements. Duplicate sample did meet requirements. Serial Dilution did meet requirements except for Sodium.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature (b) (4)
Date 9/16/08

Name (b) (4)(b) (4)
Title: (b) (4)(b) (4)

Page 1 of 1

Log-in
Date
9/4/2008

(b) (4)

NRAS Number

Corresponding

~~Off~~

Logbook Page No.

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

Contractor Laboratory Acknowledgment Document

Analysis	Modification Reference Number	Hardcopy Turnaround Requirement	Preliminary Results (Y/N)	PDF Delivery (Y/N)	(A) Estimated No. of Samples by Matrix (including billable QC)	Cost For Modified Analysis	
						(B) New Per Sample Price	(A x B) Total Cost
ICP-AES 5-10 Metals (plus B and Mo)	1629.0	14 days	N	N	149 water	\$ _____	\$ _____
ICP-AES 11-22 Metals (plus B and Mo)	1629.0	14 days	N	N	28 water 39 soil	\$ _____	\$ _____
ICP-MS 11-16 Metals	N/A	14 days	N	N	149 water	\$ _____	\$ _____
Mercury	N/A	14 days	N	N	177 water 39 soil	\$ _____	\$ _____
						Total Project Cost	\$ _____

Project Information

Estimated Shipping Period:

8/29/2008 through 9/3/2008

Additional Information:

Please note that the samples will ship under two Cases.

Note: The requirements in the RFQ are as stated, and the Government will reduce the line item price listed on the bid sheet for late deliverables at a rate of 5 percent per calendar day late, up to a maximum of 50 percent. The Government will treat noncompliant data and late data for Preliminary Results in accordance with the terms and conditions of the contract, using the price listed on the bid sheet as the basis for the calculation.

Name of Contractor Laboratory: _____

Contract Number: _____

____ Laboratory AGREES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.

____ Laboratory DECLINES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.

Signature of Laboratory Representative: _____

Date: _____

Signature of USEPA Contracting Officer: _____

Date: _____

Analysis: Description of the analyses being requested by the USEPA for this Case. This column is completed by SMO.

Modification Reference Number: The numerical value assigned to the technical requirements describing the changes to the Statement of Work. This column is completed by SMO.

Hardcopy Turnaround Requirement: The analytical data turnaround time required for this Case. This column is completed by SMO.

Preliminary Results: Indicates if Preliminary Results are required for the line item. This column is completed by SMO.

PDF Delivery: Indicates if PDF Delivery is required for the line item. This column is completed by SMO.

Estimated No. of Samples and sample Matrix (including QC): The client's estimated number of samples (by matrix), including billable QC samples, to be collected and shipped to the laboratory. This column is completed by SMO.

New Per Sample Price: Laboratory's sample price for analyzing the samples identified in the line item. This column is completed by the laboratory.

Total Cost: This value is the Estimated No. of Samples (including QC) multiplied by the New Per Sample Price. This column is completed by the laboratory.

Total Project Cost: Sum of the total costs for all line items. This is completed by the laboratory.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 8, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen C. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Gulf Club site (Case # 37813 SDG #MC02J3) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0994

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE



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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

LOCKHEED MARTIN
We never forget who we're working for™

Date: October 3, 2008

Subject: Inorganic Data Validation (IM2 Level)
Case: 37813
SDG : MC02J3
Site : Battlefield Golf Club

From: (b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4) (b) (4)
Senior Oversight Chemist

To: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02J3, consisted of six (6) aqueous samples analyzed for selected total metals by ICP-MS. The sample set included one (1) field duplicate pair. Samples were analyzed by ChemTech Consulting Group (CHEM) according to the Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by outliers present in the laboratory blanks and matrix spike analyses. Details of these outliers are discussed under "Minor Problems," specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Continuing calibration blanks (CCBs) had reported results greater than the Method Detection Limits (MDLs) for antimony (Sb), arsenic (As), chromium (Cr), cobalt (Co), silver (Ag), thallium (Tl) and vanadium (V). Positive results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) the blank concentration may be biased high and have been qualified "B" on the DSFs.

A CCB had a negative result greater than the absolute value of the MDL for selenium (Se). The quantitation limits for this analyte in all samples may be biased low and have been qualified "UL" on the DSFs.

The matrix spike recovery was low (<75% but >30%) for Ag. Low recovery may be attributed to matrix interferences or analyte lost during the digestion process. The "L" qualifier for this outlier has been superseded by "B" in samples reporting positive results on the DSFs. The quantitation limit for Ag in sample MC02C0 may be biased low and has been qualified "UL" on the DSF.

NOTES

Results for field duplicate pair MC02J3/MC02J4 were within the control limit of $\pm 20\%$ relative percent differences for all analytes except copper (Cu) and lead (Pb).

The post-digestion spike recovery was high (>125%) for Ag; however, data are not qualified based on the post-digestion spike recovery.

Reported results between MDLs and Contract Required Quantitation Limits (CRQLs) were qualified "J" unless superseded by "B" on the DSFs.

Data for Case 37813, SDG MC02J3, were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

Table 1A	Summary of qualifiers on data summary forms after data validation
Table 1B	Codes used in comments column of Table 1A
Appendix A	Glossary of Data Qualifier Codes
Appendix B	Data Summary Form(s)
Appendix C	Chain of Custody Records
Appendix D	Laboratory Case Narrative

DCN: 37813_MC02J3

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02J3

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	MC02J2, MC02J3, MC02J4, MC02J5	B		High	CCB (0.320 J ug/L)
As	MC02J3, MC02J6	B		High	CCB (0.283 J ug/L)
Cr	MC02C0, MC02J2, MC02J4	B		High	CCB (0.153 J ug/L)
Co	MC02J3, MC02J6	B		High	CCB (0.103 J ug/L)
Se	All samples		UL	Low	CBN (-0.220 J ug/L)
Ag	All samples except MC02C0	B		High	CCB (0.087 J ug/L) >MDL<CRQL MSL (49%)
	MC02C0		UL	Low	MSL (49%)
Tl	MC02J3	B		High	CCB (0.100 J ug/L)
V	MC02C0, MC02J3, MC02J4	B		High	CCB (0.217 J ug/L)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CCB	=	Continuing calibration blanks had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ blank concentrations may be biased high.
CBN	=	Continuing calibration blank had a negative result with the absolute value > MDL [result is in parenthesis]. The quantitation limit may be biased low.
>MDL<CRQL	=	Reported results are greater than MDLs but less than CRQLs and are considered estimated
MSL	=	Matrix Spike recovery was low (<75% but >30%) [percent recovery is in parenthesis]. Positive results and quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 2

Case #: 37813

SDG : (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 6

Lab. :

CHEM

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Field QC :			Dup. of (b) (6)	Dup. of (b) (6)							
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/25/2008	8/28/2008	8/29/2008	8/29/2008	8/29/2008						
Time Sampled :	09:27	10:29	11:19	11:19	11:30						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2			0.44	B	1.2	B	0.23	B	0.22	B
*ARSENIC	1	1.5		1.6		1.4	B	1.6		1.5	
BARIUM	10	1.5	J	27.9		77.9		77.0		84.1	
BERYLLIUM	1									0.11	J
*CADMIUM	1			0.16	J	0.13	J				
*CHROMIUM	2	0.60	B	0.76	B	0.82	J	0.74	B	0.90	J
COBALT	1					0.14	B				
COPPER	2	33.1		48.4		441		327		133	
*LEAD	1	2.6		1.9		10.3		1.9		8.4	
MANGANESE	1	4.3		120		257		247		213	
*NICKEL	1	0.57	J	3.6		1.1		1.1		2.0	
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL	0.070	B	0.067	B	0.050	B	0.047	B
THALLIUM	1					0.11	B				
VANADIUM	5	0.89	B	1.4	J	0.64	B	0.99	B	1.3	J
ZINC	2	21.4		31.2		17.4		16.8		140	

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 2

Case #: 37813

SDG: (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

Sample Number :		(b) (6)									
Sampling Location :		(b) (6)(b) (6)									
Matrix :		Water									
Units :		ug/L									
Date Sampled :		8/28/2008									
Time Sampled :		11:13									
Dilution Factor :		1.0									
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.4	B								
BARIUM	10	14.0									
BERYLLIUM	1										
*CADMIUM	1										
*CHROMIUM	2	1.9	J								
COBALT	1	0.14	B								
COPPER	2	54.4									
*LEAD	1	6.4									
MANGANESE	1	261									
*NICKEL	1	1.1									
SELENIUM	5		UL								
SILVER	1	0.040	B								
THALLIUM	1										
VANADIUM	5	1.2	J								
ZINC	2	1360									

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain of Custody Records



~~37814~~ 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record Relinquished By (Date / Time) Sampler Signature: <i>Erik Armistead</i> Received By (Date / Time)
Project Code:	CT4354	Carrier Name:	FedEx	
Account Code:		Airbill:	961942977974,	
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	
Spill ID:	ALM			
Site Name/State:	Battlefield Golf/VA			
Project Leader:	Erik Armistead			
Action:	Preliminary Assessment			
Sampling Co:	Tetra Tech EM Inc.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02B2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 902 (HNO3) (2)	BG08-GW-MP12	S: 8/28/2008	13:05		--
MC02B3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 903 (HNO3) (2)	BG08-GW-MP13	S: 8/28/2008	13:25		--
MC02B4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 904 (HNO3) (2)	BG08-GW-MW01	S: 8/29/2008	15:55		--
MC02B5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 905 (HNO3) (2)	BG08-GW-MW02	S: 8/29/2008	13:50		--
MC02B6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 906 (HNO3) (2)	BG08-GW-MW02D	S: 8/29/2008	13:50		--
MC02B7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 907 (HNO3) (2)	BG08-GW-MW03	S: 8/29/2008	14:50		--
MC02B8	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 908 (HNO3) (2)	BG08-SW-SW01	S: 8/29/2008	12:51		--
MC02B9	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 909 (HNO3) (2)	BG08-SW-SW02	S: 8/29/2008	15:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	796 (HNO3) (1)	(b) (6);(b) (6)	S: 8/25/2008	9:27		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)	(b) (6);(b) (6)	S: 8/25/2008	9:59		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	798 (HNO3) (1)	(b) (6);(b) (6)	S: 8/26/2008	16:45		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)

REGIONS CORP.



37814 37813

R

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	855 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	16:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	856 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	9:45		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	857 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	10:23		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	858 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	10:29 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	859 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	11:19 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	860 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	11:19 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	861 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	11:30 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	862 (HNO3) (1)	(b) (6)(b) (6)	S: 8/28/2008	11:13 ✓		--
MC02J7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	863 (Ice Only), 864 (Ice Only) (2)	BG08-SS-MP01	S: 8/25/2008	10:18		--
MC02J8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	865 (Ice Only), 866 (Ice Only) (2)	BG08-SS-MP02	S: 8/25/2008	11:35		--
MC02J9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	867 (Ice Only), 868 (Ice Only) (2)	BG08-SS-MP03	S: 8/25/2008	12:15		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)

REGION COPY

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: _____ SDG No.: MC02J3SOW No.: ILM05.4

EPA Sample No.

Lab Sample ID

MC02C0
MC02C0D
MC02C0S
MC02J2
MC02J3
MC02J4
MC02J5
MC02J6

Z4427-06
Z4427-07
Z4427-08
Z4427-02
Z4427-01
Z4427-03
Z4427-04
Z4427-05

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	_____	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	_____	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	_____	<u>NO</u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above: Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4)
Date: 9/16/03Name: (b) (4)(b) (4)
Title: (b) (4)(b) (4)(b) (4)

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

SDG NARRATIVE

USEPA
SDG # MC02J3
CASE # 37813
CONTRACT # EPW06047
LAB NAME: CHEMTECH CONSULTING GROUP
LAB CODE: CHEM
CHEMTECH PROJECT #Z4427

A. Number of Samples and Date of Receipt

6 Water Samples was delivered to the laboratory intact on 09/04/2008.

B. Parameters

Test requested for Metals CLP MS.

C. Cooler Temp

Indicator Bottle: Presence/Absence
Cooler: 4°C

D. Detail Documentation (related to Sample Handling Shipping, Analytical Problem, Temp of Cooler etc):

Issue 1: The TR/COC lists the analysis TAL TM+B+M for the ground, surface, and potable well water samples; however, the Scheduling Notification Form lists that the analysis is ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo/Hg, ICP-AES TM+B+Mo/Hg, and ICP-MS Metals for water samples. The laboratory is not sure what analyses should be performed on the water samples.

Issue 2: The laboratory received several water samples that have a container labeled for Dissolved Metals; however, the laboratory is not scheduled to receive any Dissolved Metals samples.

Issue 3: The laboratory received water samples that have the same Sample ID for the Total and Dissolved Metals fraction.

Issue 4: The laboratory received 2 containers for most of the soil samples received for the Case. The laboratory would like to perform the requested analyses from the 1st container and use the 2nd container as extra volume if needed. Are the laboratory's proposed actions acceptable to the Region?

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

E. Corrective Action taken for above:

Resolution 1: Per Region 3, the laboratory will perform the following analyses on the water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis</u>
Ground Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg
Potable Well	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals

Resolution 2: Per Region 3, the laboratory will perform the following analyses on the Dissolved Metals water samples. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

<u>Matrix</u>	<u>Analysis (filtered)</u>
Ground Water	ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629.0, Hg, and ICP-MS Metals
Surface Water	ICP-AES TM+B+Mo by MA 1629.0 and Hg

SMO will note that the laboratory accepted the laboratory's bid price of (b) (4) for ICP-AES 5-10 Metals (plus B and Mo), (b) (4) for ICP-AES 11-22 Metals (plus B and Mo), (b) (4) for ICP-MS 11-16 Metals, and (b) (4) for Mercury for the added Dissolved Metal fraction (bid sheet attached).

Resolution 3: In accordance with previous direction from Region 3, the laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples using the following instructions: The Total Metals sample will keep the CLP sample ID listed on the TR/COC. The SMO coordinator will assign a new CLP sample ID for the Dissolved/Filtered Metals sample, and notify the Region and the laboratory of the new sample ID.

<u>Total Fraction</u>	<u>Dissolved Fraction</u>
MC02A1	MC1GF1
MC02A2	MC1GF2
MC02A3	MC1GF3
MC02A4	MC1GF4
MC02A5	MC1GF5
MC02A6	MC1GF6
MC02A7	MC1GF7
MC02A8	MC1GF8
MC02A9	MC1GF9
MC02B0	MC1GG0
MC02B1	MC1GG1
MC02B2	MC1GG2
MC02B3	MC1GG3
MC02B4	MC1GG4
MC02B5	MC1GG5
MC02B6	MC1GG6
MC02B7	MC1GG7
MC02B8	MC1GG8
MC02B9	MC1GG9

Resolution 4: Per Region 3, the laboratory's proposed actions are acceptable. The laboratory will note the issue in the Case/SDG Narrative and proceed with the analysis of the samples.

CHEMTECH
284 Sheffield Street
Mountainside, NJ 07092

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

G. Calculation:

Calculation example for ICP-MS Water Sample:

Results reported in Ug/L = Results in ppb X Dilution Factor (if any) X Fraction of Sample
Amount Taken in ICP Water- Prep

Fraction of Sample Amount Taken in ICP-MS Water- Prep = $100/100$ or $50/50 = 1$
(if 100 ml Initial Volume taken and Final Volume was made to 100 ml or 50 ml Initial Volume
and Final Volume made to 50 ml in ICP-MS Water Digestion procedure)

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements except for the Silver. Duplicate sample did meet requirements. Serial Dilution did meet requirements.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature (b) (4) Name: (b) (4)(b) (4)
Date 9/10/08 Title: (b) (4)(b) (4)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 2, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case # 37813 SDG #MC0237) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0984

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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597



DATE: October 2, 2008

SUBJECT: Inorganic Data Validation (IM2 Level)
Case: 37813
SDG: MC02J7
Site: Battlefield Gold Club

FROM: (b) (4)(b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4) (b) (4)(b) (4)
Senior Oversight Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37813, Sample Delivery Group (SDG) MC02J7, consisted of thirteen (13) soil samples analyzed for total metals, boron (B) and molybdenum (Mo) by Chemtech Consulting Group (CHEM). The sample set contained no field Quality Control (QC) samples. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 (modified) through Routine Analytical Services (RAS) program. Modifications include analysis of B and Mo at the Contract Required Quantitation Limits (CRQLs) of 5 mg/Kg and 0.5 mg/Kg, respectively.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Rinsate blanks (MC02L0 and MC02L1) associated with the samples in this SDG were analyzed in a separate SDG (MC02A1). These blank results are included in Appendix C.

Data in this case have been impacted by outliers present in the laboratory and rinsate blanks as well as the matrix spike analysis. Details of these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Forms (DSFs).

MINOR PROBLEMS

Continuing calibration (CCB), preparation (PB) and/or rinsate (RB) blanks had reported results greater than the Method Detection Limits (MDLs) for the analytes listed below. Positive results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) the blank concentrations may be biased high and have been qualified "B" on the DSFs.

<u>Blank</u>	<u>Affected Analytes</u>
CCB	copper (Cu), mercury (Hg), Mo, nickel (Ni)
PB	B
RB	calcium (Ca), magnesium (Mg), manganese (Mn)

Matrix spike recoveries were low ($<75\%$ but $>30\%$) for silver (Ag) and thallium (Tl). Low recoveries may be attributed to matrix interferences or analyte lost during the digestion process. Quantitation limits for these analytes in all samples may be biased low and have been qualified "UL" on the DSFs.

NOTES

Reported results between MDLs and CRQLs were qualified "J" on the DSFs unless superseded by "B".

Solid laboratory control sample (LCS) results were below the MDLs for barium (Ba) and potassium (K) and were reported as non-detects by the laboratory. For Ba, the raw data confirms that the concentration for this analyte was within the control limits. For K, the lower control limit for this analyte is zero. Therefore, no data were qualified based on these findings.

The laboratory failed to report Hg results on Form V (Matrix Spike Sample Recovery). The reviewer used the raw data to transcribe the correct values for Hg to this form.

The continuing calibration verification (CCV05) percent recovery for Ba was slightly outside the upper control limit ($>110\%$). However, due to rounding as required by the SOW, the laboratory reported 110%, which is within control limits. No data were qualified based on this finding.

The post-digestion spike recovery was high ($>125\%$) for Tl; however, data are not qualified based on the post-digestion spike recovery.

Data for Case 37813, SDG MC02J7, were reviewed in accordance with National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLE 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORMS
APPENDIX C	CHAIN OF CUSTODY RECORDS
APPENDIX D	LABORATORY CASE NARRATIVE

DCN: 37813.MC02J7IM2.doc

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37813, SDG MC02J7

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
B	All Samples Except MC02K4, MC02K6	B		High	PB (0.818 J mg/Kg)
Ca	MC02J8, MC02K0, MC02K2, MC02K4, MC02K7, MC02K8	B		High	RB (527 J µg/L)
Cu	MC02J8, MC02K0, MC02K4	B		High	CCB (2.520 J µg/L)
Mg	MC02K7	B		High	RB (116 J µg/L)
Mn	MC02K7, MC02K8	B		High	RB (8.0 J µg/L)
Mo	MC02K5, MC02K6, MC02K7	B		High	CCB (2.545 J µg/L)
Hg	MC02K5, MC02K9	B		High	CCB (0.083 J µg/L)
Ni	MC02J8, MC02K0, MC02K2, MC02K4, MC02K7, MC02K8	B		High	CCB (5.750 J µg/L)
Ag	All Samples		UL	Low	MSL (69%)
Tl	All Samples		UL	Low	MSL (61%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

PB	=	Preparation blank had a result >MDL [result is in parenthesis]. Positive results which are $\leq 5X$ the blank concentration may be biased high.
RB	=	Rinsate blank had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ the blank concentrations may be biased high.
CCB	=	Continuing calibration blanks had results >MDLs [results are in parenthesis]. Positive results which are $\leq 5X$ the blank concentrations may be biased high.
MSL	=	Matrix spike recoveries were low (<75% but >30%) [% recoveries are in parenthesis]. Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 3

Case #: 37813

SDG : MC02J7

Number of Soil Samples : 13

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 0

Lab. :

CHEM

Sample Number :		MC02J7		MC02J8		MC02J9		MC02K0		MC02K1	
Sampling Location :		BG08-SS-MP01		BG08-SS-MP02		BG08-SS-MP03		BG08-SS-MP04		BG08-SS-MP05	
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	
Time Sampled :		10:18		11:35		12:15		13:24		14:15	
%Solids :		72.2		78.2		84.6		76.8		78.1	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	20	26500		859		2690		1090		14000	
ANTIMONY	6										
ARSENIC	1	3.2		0.53	J	0.50	J	0.26	J	2.7	
BARIUM	20	80.5		3.4	J	11.3	J	2.8	J	46.9	
BERYLLIUM	0.5	0.52	J	0.087	J	0.15	J			0.92	
BORON	5	2.9	B	1.1	B	2.0	B	0.98	B	3.3	B
CADMIUM	0.5										
CALCIUM	500	814		255	B	407	J	151	B	428	J
CHROMIUM	1	18.8		3.0		8.8		2.5		15.3	
COBALT	5	4.0	J	1.4	J	1.8	J	0.69	J	1.4	J
COPPER	2.5	8.4		0.76	B	3.3		0.60	B	2.2	J
IRON	10	4660		980		3040		565		11300	
*LEAD	1	18.6		1.2	J	2.3		0.90	J	8.1	
MAGNESIUM	500	1290		178	J	780		118	J	572	J
MANGANESE	1.5	22.5		8.1		18.6		6.0		11.9	
MOLYBDENUM	0.5										
MERCURY	0.1	0.054	J					0.095	J	0.12	J
NICKEL	4	11.0		2.5	B	5.5		1.3	B	5.5	
POTASSIUM	500	830				339	J			198	J
SELENIUM	3.5	1.1	J	0.61	J	0.54	J			1.2	J
SILVER	1		UL		UL		UL		UL		UL
SODIUM	500	82.0	J	84.7	J	43.6	J			47.8	J
THALLIUM	2.5		UL		UL		UL		UL		UL
VANADIUM	5	20.3		2.5	J	9.1		2.3	J	35.7	
ZINC	6	14.7		8.9		13.1		6.7	J	7.2	J

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 3

Case #: 37813

SDG : MC02J7

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Sample Number :		MC02K2		MC02K3		MC02K4		MC02K5		MC02K6	
Sampling Location :		BG08-SS-MP06		BG08-SS-MP07		BG08-SS-MP08		BG08-SS-MP09		BG08-SS-MP10	
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/26/2008		8/26/2008	
Time Sampled :		15:07		15:57		17:10		08:01		08:35	
%Solids :		82.3		83.7		78.6		77.9		82.8	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	20	1540		15600		532		14200		11400	
ANTIMONY	6										
ARSENIC	1	0.40	J	1.3				1.9		4.6	
BARIUM	20	11.6	J	218				60.4		57.0	
BERYLLIUM	0.5	0.073	J	0.59	J			0.38	J	0.50	J
BORON	5	1.1	B	2.3	B			5.1	B	5.6	J
CADMIUM	0.5	0.067	J								
CALCIUM	500	197	B	962		193	B	892		838	
CHROMIUM	1	5.1		20.6		2.5		35.3		29.9	
COBALT	5	1.6	J	1.7	J			5.4	J	4.8	J
COPPER	2.5	2.2	J	3.2		0.72	B	10.5		12.9	
IRON	10	2320		7970		707		13000		19900	
*LEAD	1	1.8		8.4		0.92	J	4.6		6.6	
MAGNESIUM	500	371	J	776		145	J	2330		2290	
MANGANESE	1.5	13.0		17.9		8.7		41.5		40.9	
MOLYBDENUM	0.5							0.60	B	1.5	B
MERCURY	0.1							0.065	B		
NICKEL	4	3.3	B	9.4		1.4	B	12.7		12.2	
POTASSIUM	500	143	J	246	J			1230		1000	
SELENIUM	3.5	0.42	J	0.78	J	0.67	J	0.96	J	1.4	J
SILVER	1		UL		UL		UL		UL		UL
SODIUM	500	33.7	J	68.7	J			82.3	J	76.1	J
THALLIUM	2.5		UL		UL		UL		UL		UL
VANADIUM	5	5.2	J	13.9		2.3	J	31.6		43.5	
ZINC	6	8.0		9.8		6.7	J	30.6		27.2	

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 3 of 3

Case #: 37813

SDG : MC02J7

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

Sample Number :		MC02K7		MC02K8		MC02K9					
Sampling Location :		BG08-SS-MP11		BG08-SS-MP12		BG08-SS-MP13					
Matrix :		Soil		Soil		Soil					
Units :		mg/Kg		mg/Kg		mg/Kg					
Date Sampled :		8/26/2008		8/26/2008		8/26/2008					
Time Sampled :		09:36		10:20		11:10					
%Solids :		79.5		76.6		74.8					
Dilution Factor :		1.0		1.0		1.0					
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	20	631		1010		11800					
ANTIMONY	6										
ARSENIC	1	0.49	J			2.2					
BARIUM	20					30.6					
BERYLLIUM	0.5					0.42	J				
BORON	5	1.0	B	1.0	B	1.7	B				
CADMIUM	0.5										
CALCIUM	500	81.3	B	77.6	B	401	J				
CHROMIUM	1	1.5		1.8		10.9					
COBALT	5	0.76	J			1.4	J				
COPPER	2.5			0.62	J	2.8	J				
IRON	10	468		430		1780					
*LEAD	1	0.50	J	0.64	J	6.8					
MAGNESIUM	500	61.1	B	91.4	J	449	J				
MANGANESE	1.5	4.4	B	3.6	B	10.5					
MOLYBDENUM	0.5	0.28	B								
MERCURY	0.1					0.098	B				
NICKEL	4	1.2	B	1.1	B	4.5	J				
POTASSIUM	500					232	J				
SELENIUM	3.5	0.58	J	0.72	J	1.1	J				
SILVER	1		UL		UL		UL				
SODIUM	500										
THALLIUM	2.5		UL		UL		UL				
VANADIUM	5	1.6	J	1.7	J	8.8					
ZINC	6	6.4	J	4.8	J	9.0					

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

Appendix C

Chain-of-Custody Records



37814 37813

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature:	<i>Erik Armistead</i>		
Project Code:	CT4354	Carrier Name:	FedEx		Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942977974		1			
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900		2.			
Spill ID:	ALM				3.			
Site Name/State:	Battlefield Golf/VA			4.				
Project Leader:	Erik Armistead							
Action:	Preliminary Assessment							
Sampling Co:	Tetra Tech EM Inc.							

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	855 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	16:13		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	856 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	9:45		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	857 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	10:23		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	858 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	10:29		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	859 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	860 (HNO3) (1)	(b) (6)/(b) (6)/(b) (6)	S: 8/29/2008	11:19		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	861 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/29/2008	11:30		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	862 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/28/2008	11:13		--
MC02J7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	863 (Ice Only), 864 (Ice Only) (2)	BG08-SS-MP01	S: 8/25/2008	10:18		--
MC02J8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	865 (Ice Only), 866 (Ice Only) (2)	BG08-SS-MP02	S: 8/25/2008	11:35		--
MC02J9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	867 (Ice Only), 868 (Ice Only) (2)	BG08-SS-MP03	S: 8/25/2008	12:15		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)



37814 37813

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(E)

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record.	Sampler Signature:	<i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx		Received By	
Account Code:		Airbill:	961942977974,	Relinquished By	(Date / Time)	(Date / Time)
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting Group (CHEMED)	1.		
Spill ID:	ALM		284 Sheffield Street	2.		
Site Name/State:	Battlefield Golf/VA		Mountainside NJ 07092	3.		
Project Leader:	Erik Armistead		(908) 789-8900	4.		
Action:	Preliminary Assessment					
Sampling Co:	Tetra Tech EM Inc.					

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02K0	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	869 (Ice Only), 870 (Ice Only) (2)	BG08-SS-MP04	S: 8/25/2008	13:24		--
MC02K1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	871 (Ice Only), 872 (Ice Only) (2)	BG08-SS-MP05	S: 8/25/2008	14:15		--
MC02K2	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	873 (Ice Only), 874 (Ice Only) (2)	BG08-SS-MP06	S: 8/25/2008	15:07		--
MC02K3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	875 (Ice Only), 876 (Ice Only) (2)	BG08-SS-MP07	S: 8/25/2008	15:57		--
MC02K4	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	877 (Ice Only), 878 (Ice Only) (2)	BG08-SS-MP08	S: 8/25/2008	17:10		--
MC02K5	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	879 (Ice Only), 880 (Ice Only) (2)	BG08-SS-MP09	S: 8/26/2008	8:01		--
MC02K6	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	881 (Ice Only), 882 (Ice Only) (2)	BG08-SS-MP10	S: 8/26/2008	8:35		--
MC02K7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	883 (Ice Only), 884 (Ice Only) (2)	BG08-SS-MP11	S: 8/26/2008	9:36		--
MC02K8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	885 (Ice Only), 886 (Ice Only) (2)	BG08-SS-MP12	S: 8/26/2008	10:20		--
MC02K9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	887 (Ice Only), 888 (Ice Only) (2)	BG08-SS-MP13	S: 8/26/2008	11:10		--
MC02L0	Ground Water/ Erik Armistead	L/G	TAL TM+B+M (14)	889 (HNO3) (1)	BG08-RB01	S: 8/26/2008	10:15		Rinsate

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0001

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

U.S. EPA Region III Analytical Request Form

JTS 8-25-08

ASQAB USE ONLY		
RAS#	CT4353	Analytical TAT 14
DAS#		
NSF#		

37813

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
		Date Approved: 8/20/2008	
EPA Project Leader: CHRIS WAGNER	Phone#:	Cell Phone #: 804-337-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOSHUA COPE	Phone#: 610-364-2130	Cell Phone #: 215-768-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK ARMISTEAD	Phone#: 610-364-2151	Cell Phone #: 267 446 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 30-35	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg <i>CHEM</i>	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

DATA SUMMARY FORM: INORGANIC

Page 4 of 5

Case #: 37813

SDG : MC02A1

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

ALL TOTAL METALS

Sample Number :		MC02B6		MC02B7		MC02B8		MC02B9		MC02L0	
Sampling Location :		BG08-GW-MW02D		BG08-GW-MW03		BG08-SW-SW01		BG08-SW-SW02		BG08-RB01	
Field QC :		Dup of MC02B5								Rinsate Blank	
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/26/2008	
Time Sampled :		13:50		14:50		12:51		15:40		10:15	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	397		561		403		630			
ANTIMONY	60										
*ARSENIC	10	5.8	J	3.4	J						
BARIUM	200					30.0	J	37.9	J		
BERYLLIUM	5					0.59	J	0.55	J		
BORON	50	27.5	J	17.4	J	25.6	J	22.1	J		UL
*CADMIUM	5		UL		UL		UL		UL		UL
CALCIUM	5000	72100		59500		19300		24900		376	J
*CHROMIUM	10	1.2	J	1.9	J						
COBALT	50					5.6	J	9.2	J		
COPPER	25										
IRON	100	5380		8030		996	B	1140	B	124	
*LEAD	10	16.1		16.2		4.8	J	1.4	J		UL
MAGNESIUM	5000	20200		18800		7250		8530			
MANGANESE	15	123		184		360		358		2.4	J
MOLYBDENUM	5		UL		UL		UL		UL		UL
MERCURY	0.2										
*NICKEL	40					3.6	J	4.9	J		
POTASSIUM	5000	1810	J	2590	J	2620	J	4680	J		
SELENIUM	35										
SILVER	10										
SODIUM	5000	32600	J	25000	J	14600	J	23400	J		
THALLIUM	25		UL		UL		UL		UL		UL
VANADIUM	50			2.8	J						
ZINC	60	6.5	B	24.1	J	24.7	J	26.0	J	1.9	J

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

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DATA SUMMARY FORM: INORGANIC

Page 5 of 5

Case #: 37813

SDG : MC02A1

Site :

BATTLEFIELD GOLF CLUB

Lab. :

CHEM

		TOTAL		DISSOLVED		DISSOLVED					
Sample Number :		MC02L1		MC1GG8		MC1GG9					
Sampling Location :		BG08-RB02		BG08-SW-SW01		BG08-SW-SW02					
Field QC :		Rinsate Blank									
Matrix :		Water		Water		Water					
Units :		ug/L		ug/L		ug/L					
Date Sampled :		8/26/2008		8/29/2008		8/29/2008					
Time Sampled :		10:15		12:51		15:40					
Dilution Factor :		1.0		1.0		1.0					
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200		UL	319		478					
ANTIMONY	60			5.9	B						
*ARSENIC	10										
BARIUM	200			33.3	J	40.6	J				
BERYLLIUM	5			0.52	J	0.50	J				
BORON	50			34.8	B	30.9	B				
*CADMIUM	5										
CALCIUM	5000	527	J	18400		23300					
*CHROMIUM	10										
COBALT	50			4.8	J	8.2	J				
COPPER	25										
IRON	100	571		665	B	254	B				
*LEAD	10										
MAGNESIUM	5000	116	J	6520		7510					
MANGANESE	15	8.0	J	346		339					
MOLYBDENUM	5										
MERCURY	0.2		UL		UL		UL				
*NICKEL	40			11.3	J	13.1	J				
POTASSIUM	5000		UL	2700	J	4610	J				
SELENIUM	35										
SILVER	10										
SODIUM	5000		UL	15700	J	24400	J				
THALLIUM	25										
VANADIUM	50										
ZINC	60	2.1	J	22.1	J	22.8	J				

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

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Appendix D

Laboratory Case Narrative

USEPA - CLP

COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047Lab Code: CHEM Case No.: 37813 NRAS No.: 1629.0 SDG No.: MC02J7SOW No.: ILM05.4

EPA Sample No.

MC02J7
MC02J8
MC02J9
MC02K0
MC02K1
MC02K2
MC02K3
MC02K4
MC02K5
MC02K6
MC02K7
MC02K8
MC02K9
MC02K9D
MC02K9S

Lab Sample ID

Z4397-01
Z4397-02
Z4397-03
Z4397-04
Z4397-05
Z4397-06
Z4397-07
Z4397-08
Z4397-09
Z4397-10
Z4397-11
Z4397-12
Z4397-13
Z4397-14
Z4397-15

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u> </u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u> </u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u> </u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

(b) (4)

Name: (b) (4)(b) (4)

Date: _____

9/16/08

Title: (b) (4)(b) (4)(b) (4)

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

SDG NARRATIVE

USEPA

SDG # MC02J7

CASE # 37813

CONTRACT # EPW06047

LAB NAME: CHEMTECH CONSULTING GROUP

LAB CODE: CHEM

CHEMTECH PROJECT #Z4397

MODIFIED ANALYSIS: 1629.0

A. Number of Samples and Date of Receipt

13 Soil Samples were delivered to the laboratory intact on 09/03/2008.

B. Parameters

Test requested for ICP - AES- TM + B+ MO & HG.

C. Cooler Temp

Indicator Bottle: Presence/Absence

Cooler: 4°C

**D. Detail Documentation (related to Sample Handling
Shipping, Analytical Problem, Temp of Cooler etc):**

E. Corrective Action taken for above:

F. Analytical Techniques:

All analyses were based on CLP Methodology by method ILM05.4

CHEMTECH

284 Sheffield Street

Mountainside, NJ 07092

G. Calculation:

Calculation example for ICP-AES Soil Sample:

Conversion of Results from mg/L or ppm to mg/kg (Dry Weight Basis):

Results reported in Mg/Kg = (Result in mg/L or ppm for ICP-AES) X 1000 X Fraction of % Solid (100/ % Solid) X Dilution Factor (if any) X Fraction of Sample Amount Taken in ICP-Soil Prep.

Example of Fraction of Sample Amount Taken in ICP-AES Soil Prep = 1/10 (1.0 X 10 or 0.50 X 20)

(if 1.0 g of sample taken during Digestion and the Final Volume was made to 100 ml or 0.5 g to Final Volume 50ml)

Or

Example of Fraction of Sample Amount Taken in ICP-AES Soil Prep = 1/10.2 (1.02 X 10 or 0.51 X 20)

(if 1.02 g of sample taken during Digestion and the Final Volume was made to 100 ml or 0.51 g to Final Volume 50ml)

Etc.

Calculation example for Hg Soil Sample:

Conversion of Results from ppb to mg/kg (Dry Weight Basis):

Results reported in Mg/Kg = (Result in ppb for Hg) X Fraction of % Solid (100/ % Solid) X Dilution Factor (if any) X Fraction of Sample Amount Taken in Prep.

Example of Fraction of Sample Amount Taken in Hg Soil Prep = 1/ 2 (0.2 X 10)

(if 0.2 g of sample taken during Digestion and the Final Volume was made to 100 ml)

Or

Example of Fraction of Sample Amount Taken in Hg Soil Prep = 1 / 2.1 (0.21 X 10)

(if 0.21 g of sample taken during Digestion and the Final Volume was made to 100 ml)

Etc.

CHEMTECH

284 Sheffield Street
Mountainside, NJ 07092

H. QA/ QC

Calibrations met requirements. Interference check met requirements. Blank analyses did not indicate any presence of contamination. Laboratory Control sample was within control limits. Spike sample did meet requirements except for Silver and Thallium. Duplicate sample did meet requirements. Serial Dilution did meet requirements.

I certify that the data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Director or his designee, as verified by the following signature.

Signature (b) (4)

Name: (b) (4)(b) (4)

Date 9/16/98

Title (b) (4)(b) (4)

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modification Analysis:

Laboratory Name:

Laboratory Comments:



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 22, 2008

SUBJECT: Region III Data QA Review

FROM : Khin Cho Thaung *KCT*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case # 37814 SDG #MC1GH0) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2743.

Attachment

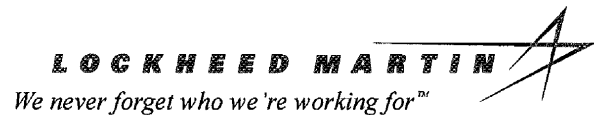
cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 1050

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597



DATE: October 17, 2008

SUBJECT: Inorganic Data Validation (IM2 Level)
Case: 37814
SDG: MC1GH0
Site: Battlefield Golf Club

FROM: (b) (4)(b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4)(b) (4)(b) (4)
Senior Oversight Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37814, Sample Delivery Group (SDG) MC1GH0, consisted of three (3) filtrate aqueous samples analyzed for dissolved aluminum (Al), boron (B), calcium (Ca), iron (Fe), magnesium (Mg), mercury (Hg), molybdenum (Mo), potassium (K) and sodium (Na). All samples were analyzed by A4 Scientific, Inc. (A4). The sample set contained no field Quality Control (QC) samples. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 (modified) through Routine Analytical Services (RAS) program. Modifications include analysis of B and Mo at the Contract Required Quantitation Limits (CRQLs) of 50 µg/L and 5 µg/L, respectively.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by an outlier present in the matrix spike analysis. Details of this outlier are discussed under "Minor Problem", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on a single Data Summary Form (DSF).

MINOR PROBLEM

The matrix spike recovery was high (>125%) for B. Positive results for this analyte in all samples may be biased high. The “K” qualifier for this outlier has been superseded by “J” on the DSF.

NOTES

Reported results between Method Detection Limits (MDLs) and CRQLs were qualified “J” on the DSF.

In this SDG, the following samples were assigned the same EPA sample numbers for both total and dissolved metals analyses. New, unique sample numbers were assigned to each sample submitted for dissolved metals analysis, and the samples submitted for total metals analysis retained the original sample numbers as listed on the chain of custody (COC) records. The laboratory failed to provide documentation in the data package explaining how the dissolved sample IDs were assigned.

<u>Sample ID on COC</u>	<u>Dissolved Metal Sample ID</u>
MC02L2	MC1GH0
MC02L3	MC1GH1
MC02L4	MC1GH2

The laboratory failed to provide a Form IX (Method Detection Limits) associated with preparation method HW1. The laboratory did provide a Form IX for preparation method NP1; however, preparation method HW1 was used for actual sample analysis.

The post-digestion spike recovery was also high (>125%) for B.

Data for Case 37814, SDG MC1GH0, were reviewed in accordance with National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLE 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORMS
APPENDIX C	CHAIN OF CUSTODY RECORDS
APPENDIX D	LABORATORY CASE NARRATIVE

DCN: 37814.MC1GH0IM2.doc

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37814, SDG MC1GH0

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
B	All Samples	J			>MDL<CRQL MSH (193%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

>MDL = <CRQL	Reported results are greater than MDLs but less than CRQLs and are considered estimated.
MSH =	Matrix spike recovery was high (>125%) [% recovery is in parenthesis]. Positive results may be biased high.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 1

Case #: 37814

SDG : MC1GH0

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 3

Lab. :

A4

ALL DISSOLVED METALS

Sample Number :		MC1GH0		MC1GH1		MC1GH2					
Sampling Location :		BG08-GW-MP03S		BG08-GW-MP08S		BG08-GW-MW03S					
Matrix :		Water		Water		Water					
Units :		ug/L		ug/L		ug/L					
Date Sampled :		8/29/2008		8/29/2008		8/29/2008					
Time Sampled :		10:00		09:10		14:50					
Dilution Factor :		1.0		1.0		1.0					
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200										
BORON	50	25.3	J	49.7	J	26.1	J				
CALCIUM	5000	65800		47600		57300					
IRON	100	6920		12400		6980					
MAGNESIUM	5000	35600		13600		18400					
MERCURY	0.2										
MOLYBDENUM	5										
POTASSIUM	5000	4820	J	2830	J	2620	J				
SODIUM	5000	23200		12700		24600					

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



DAS No:

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record		Sampler Signature:	<i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942978010	1	<i>Erik Armistead 9/2/08 1700</i>		
CERCLIS ID:	VAN000306614	Shipped to:	A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277	2.			
Spill ID:	ALM			3.			
Site Name/State:	Battlefield Golf - 10% Split/VA			4.			
Project Leader:	Erik Armistead						
Action:	Preliminary Assessment						
Sampling Co:	Tetra Tech EM Inc.						

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L2 MC16-H0	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (HNO3) (2)	BG08-GW-MP03S	S: 8/29/2008	10:00 ✓		--
MC02L3 MC16-H1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	9:10 ✓		--
MC02L4 MC16-H2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (HNO3) (2)	BG08-GW-MW03S	S: 8/29/2008	14:50 ✓		--
MC02L5	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	916 (HNO3), 917 (HNO3) (2)	BG08-SW-SW02S	S: 8/29/2008	15:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	920 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	921 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	10:12		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:13		--
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), 924 (Ice Only) (2)	BG08-SS-MP06S	S: 8/25/2008	15:07		--
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 (Ice Only) (2)	BG08-SS-MP12S	S: 8/26/2008	10:20		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)

U.S. EPA Region III Analytical Request Form

9/15-8.25.08

ASQAB USE ONLY		
RAS#	CT4354	Analytical TAT
DAS#		14
NSF#		

37814

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 4	Matrix: soil -	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA-CLP

COVER PAGE

Lab Name: A4 Scientific, Inc. Contract: EPW06057
 Lab Code: A4 Case No: 37814 NRAS No.: _____ SDG No: MC1GH0
 SOW No.: ILM05.4

EPA Sample No.

Lab Sample ID

MC1GH00009542-01MC1GH0D0009542-01DMC1GH0S0009542-01SMC1GH10009542-02MC1GH20009542-03

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u>NO</u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

Name: *for* _____Date: 10.7.08

Title: _____

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057

Case #: 37814

SDG #: MC1GH0

SDG NARRATIVE

SAMPLE RECIEPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

ICP-AES

HG-Mercury

No other discrepancies or issues were noted during receipt and login.

pH of the water samples was verified upon sample receipt and is listed below:

EPA SAMPLE #	LAB SAMPLE #	pH-ICP-AES, Hg
MC1GH0	0009542-01	<2
MC1GH1	0009542-02	<2
MC1GH2	0009542-03	<2
MC1GH3	0009542-04	<2

up 10.7.08

MERCURY

Water samples were digested by Hot-Block technique (CW1) and analyzed using a Perkin Elmer FIMS-100

MS and DUP were performed on sample "MC1GH0" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed with in the contractual holding times.

ICP-AES

Water Samples were digested by Hot-Block technique (HW1) and analyzed using a Thermo Electron ICAP6500.

MS and DUP were performed on sample "MC1GH0" and they were within the QC limits.

The Serial dilution was performed on sample "MC1GH0" and it was within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed with in the contractual holding times.

000000002

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057	Case #: 37814	SDG #: MC1GH0
----------------------	---------------	---------------

SDG NARRATIVE

The following equations are used for calculation of sample results from raw instrument output data:

MERCURY

WATER Samples:

A standard curve is prepared by plotting the instrumental response of processed standards against true concentration values. Using a linear regression equation, the concentration of field and Quality Control (QC) samples is determined.

ICP-AES

WATER Samples:

$$\text{Concentration } (\mu\text{g/L}) = C * \frac{V_f}{V_i} * DF$$

Where,

C = Instrument value in $\mu\text{g/L}$

V_f = Final digestion volume (mL) (50ml)

V_i = Initial digestion volume (mL) (50ml)

DF = Dilution Factor

000000003

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

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Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

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Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 22, 2008

SUBJECT: Region III Data QA Review

FROM : Khin Cho Thaung KCT
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case # 37814 SDG #MC1GH1) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2743.

Attachment

cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 1049

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE



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Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597



DATE: October 17, 2008

SUBJECT: Inorganic Data Validation (IM2 Level)
Case: 37814
SDG: MC1GH1
Site: Battlefield Golf Club

FROM: (b) (4)(b) (4)
Inorganic Data Reviewer

(b) (4) (b) (4)
Senior Oversight Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37814, Sample Delivery Group (SDG) MC1GH1, consisted of three (3) filtrate aqueous samples analyzed for dissolved metals by A4 Scientific, Inc. (A4). The sample set contained no field Quality Control (QC) samples. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Samples in this SDG were analyzed by the ICP-MS method which does not include analysis for aluminum (Al), calcium (Ca), iron (Fe), magnesium (Mg), mercury (Hg), potassium (K) and sodium (Na). Hg was analyzed in SDG MC1GH0 using a cold vapor technique. The remaining analytes were analyzed by the ICP-AES method for which the results are provided in a separate SDG (MC1GH0).

Data in this case have been impacted by outliers present in the matrix spike analysis. Details of these outliers are discussed under "Minor Problem", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on a single Data Summary Form (DSF).

MINOR PROBLEM

Matrix spike recoveries were high (>125%) for arsenic (As), barium (Ba), chromium (Cr), cobalt (Co), manganese (Mn), nickel (Ni) and zinc (Zn). Positive results for these analytes in affected samples may be biased high and have been qualified "K" on the DSF unless superseded by "J".

NOTES

Reported results between Method Detection Limits (MDLs) and Contract Required Quantitation Limits (CRQLs) were qualified "J" on the DSF.

In this SDG, the following samples were assigned the same EPA sample numbers for both total and dissolved metals analyses. New, unique sample numbers were assigned to each sample submitted for dissolved metals analysis, and the samples submitted for total metals analysis retained the original sample numbers as listed on the chain of custody (COC) records. The laboratory failed to provide documentation in the data package explaining how the dissolved sample IDs were assigned.

<u>Sample ID on COC</u>	<u>Dissolved Metal Sample ID</u>
MC02L2	MC1GH0
MC02L3	MC1GH1
MC02L4	MC1GH2

Matrix spike recoveries were high (>125%) for antimony (Sb), beryllium (Be), cadmium (Cd), copper (Cu), lead (Pb), selenium (Se), thallium (Tl) and vanadium (V). However, the associated sample results for these analytes were reported as non-detects; therefore, no data were qualified based on these outliers.

The laboratory failed to analyze a post digestion spike for the analytes that failed the matrix spike analysis as required by the SOW. No data were qualified based on this finding.

Data for Case 37814, SDG MC1GH1, were reviewed in accordance with National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLE 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORMS
APPENDIX C	CHAIN OF CUSTODY RECORDS
APPENDIX D	LABORATORY CASE NARRATIVE

DCN: 37814.MC1GH1IM2.doc

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37814, SDG MC1GH1

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
As	All Samples	K		High	MSH (174%)
Ba	All Samples	K		High	MSH (172%)
Cr	MC1GH0, MC1GH2	J			>MDL<CRQL MSH (146%)
Co	All Samples	K		High	MSH (145%)
Mn	All Samples	K		High	MSH (152%)
Ni	All Samples	K		High	MSH (139%)
Zn	MC1GH0	J			>MDL<CRQL MSH (166%)
	MC1GH1, MC1GH2	K		High	MSH (166%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

MSH =	Matrix spike recoveries were high (>125%) [% recoveries are in parenthesis]. Positive results may be biased high.
>MDL = <CRQL	Reported results are greater than MDLs but less than CRQLs and are considered estimated.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 1

Case #: 37814

SDG : MC1GH1

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 3

Lab. :

A4

ALL DISSOLVED METALS

Sample Number :		MC1GH0		MC1GH1		MC1GH2					
Sampling Location :		BG08-GW-MP03S		BG08-GW-MP08S		BG08-GW-MP03S					
Matrix :		Water		Water		Water					
Units :		ug/L		ug/L		ug/L					
Date Sampled :		8/29/2008		8/29/2008		8/29/2008					
Time Sampled :		10:00		09:10		14:50					
Dilution Factor :		1.0		1.0		1.0					
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.2	K	2.7	K	1.6	K				
BARIUM	10	21.2	K	17.7	K	17.1	K				
BERYLLIUM	1										
*CADMIUM	1										
*CHROMIUM	2	1.7	J			0.71	J				
COBALT	1	6.2	K	10.2	K	2.3	K				
COPPER	2										
*LEAD	1										
MANGANESE	1	71.8	K	111	K	146	K				
*NICKEL	1	7.8	K	12.8	K	3.1	K				
SELENIUM	5										
SILVER	1										
THALLIUM	1										
VANADIUM	5										
ZINC	2	1.5	J	91.8	K	10.9	K				

CRQL = Contract Required Quantitation Limit

*Action Level Exists

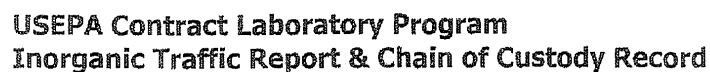
SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



DAS No:

ord	Sampler Signature: <i>E. J. [Signature]</i>
-----	--

(Date / Time)	Received By	(Date / Time)
---------------	-------------	---------------

9/2/08 1700

[illegible]

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L2 MC16-H0	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	10:00 ✓		--
MC02L3 MC16-H1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	9:10 ✓		--
MC02L4 MC16-H2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (HNO3) (2)	BG08-GW-MW03S	S: 8/29/2008	14:50 ✓		--
MC02L5	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	916 (HNO3), 917 (HNO3) (2)	BG08-SW-SW02S	S: 8/29/2008	15:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	920 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	921 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	10:12		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:13		--
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), 924 (Ice Only) (2)	BG08-SS-MP06S	S: 8/25/2008	15:07		--
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 (Ice Only) (2)	BG08-SS-MP12S	S: 8/26/2008	10:20		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

U.S. EPA Region III Analytical Request Form

975-8.25-08

ASQAB USE ONLY		
RAS#	CT4354	Analytical TAT 14
DAS#		
NSF#		

37814

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 4	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA-CLP

COVER PAGE

Lab Name: A4 Scientific, Inc. Contract: EPW06057
Lab Code: A4 Case No: 37814 NRAS No.: _____ SDG No: MC1GH1
SOW No.: ILM05.4

EPA Sample No.	Lab Sample ID
<u>MC1GH0</u>	<u>0009587-01</u>
<u>MC1GH0D</u>	<u>0009587-01D</u>
<u>MC1GH0S</u>	<u>0009587-01S</u>
<u>MC1GH1</u>	<u>0009587-02</u>
<u>MC1GH2</u>	<u>0009587-03</u>

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u>NO</u>

Comments: DISSOLEVD METALS

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

(b) (4)

Name: _____

(b) (4)(b) (4)

Date: _____

10. 9. 08

Title: _____

(b) (4)

0000000001

Contract #: EPW06057

Case #: 37814

SDG #: MC1GH0

SDG NARRATIVE

SAMPLE RECEIPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

No other discrepancies or issues were noted during receipt and login.

pH of the water samples was verified upon sample receipt and is listed below:

EPA SAMPLE #	LAB SAMPLE #	pH- ICP-MS, Hg
MC1GH0	0009587-01	<2
MC1GH1	0009587-02	<2
MC1GH2	0009587-03	<2

ICP-MS

Water samples were digested by Hot-Block technique (HW3) and analyzed using a Thermo Electron Corporation ICP MS model X-II.

No problems were encountered during sample preparation or analysis.

MS and DUP were performed on sample "MC1GH0" and they were within the QC limits.

All samples were prepared and analyzed within the contractual holding times.

The following equations are used for calculation of sample results from raw instrument output data:

ICP-MS

Water Samples:

$$\text{Concentration } (\mu\text{g/L}) = C * \frac{V_f}{V_i} * DF$$

Where,

C = Instrument value in $\mu\text{g/L}$ (The average of all replicate integrations).

V_f = Final digestion volume (mL) (50ml)

V_i = Initial digestion volume (mL) (50ml)

DF = Dilution Factor



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: October 17, 2008

SUBJECT: Region III Data QA Review

FROM: Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO: Christine Wagner
Regional Project Manager (3HS21)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case #: 37814; SDG#: MC1GH3) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call Robin Danesi at (410)305-2607 or me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO: #0014 TDF: #1048

ANALYTICAL SERVICE AND QUALITY ASSURANCE BRANCH

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

LOCKHEED MARTIN
We never forget who we're working for™



DATE: October 16, 2008

SUBJECT: Level IM2 Inorganic Data Validation for Case 37814
SDG: MC1GH3
Site: Battlefield Golf Club

FROM: (b) (4)(b) (4)
Inorganic Data Reviewer

Through: (b) (4) (b) (4)
Senior Data Review Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37814, Sample Delivery Group (SDG) MC1GH3, consisted of one (1) filtrate aqueous sample submitted to A4 Scientific, Inc. (A4) for dissolved metals analyses. The sample was analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 (Modified) through the Routine Analytical Services (RAS) program. Modifications included analysis of boron (B) at a Contract Required Quantitation Limit (CRQL) of 50 ug/L and molybdenum (Mo) at CRQL of 5.0 ug/L using modification reference number 1629.0

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Inorganic Data Review, level IM2. Areas of concern with respect to data usability are listed below.

Data in this Case have been impacted by outliers present in the sample holding time as well as matrix spike analysis. Details for these outliers are discussed under "Minor Problems", specific sample affected are outlined in "Table 1A" and qualified analytical results for this sample are summarized on a single Data Summary Form (DSF).

MINOR PROBLEM

The matrix spike recovery was high (>125%) for boron (B). The positive result reported for this analyte may be biased high. The "K" qualifier for this outlier has been superseded by "J" on the DSF.

The matrix spike recovery was low (<75% but > 30%) for silver (Ag). The low recovery may be attributed to matrix interferences or analyte lost during the digestion process. The quantitation limit for this analyte may be biased low and has been qualified "UL" on the DSF.

The aqueous technical holding time of twenty-eight (28) days from time of sample collection to sample analysis for mercury (Hg) has been exceeded by eleven (11) days for sample MC1GH3. The quantitation limit for Hg in this sample may be biased low and has been qualified "UL" on the DSF.

NOTES

Positive results which are less than the Contract Required Quantitation Limits (CRQLs) but greater than Method Detection Limits (MDLs) have been qualified "J" on the DSF.

The post digestion spike recovery was high for B. No data were qualified based on this outlier.

The EPA sample MC02L5 was designated for both total metals and dissolved metals on the Chain-of-Custody record (COC). The Sample Management Office (SMO) assigned new sample number MC1GH3 for the dissolved metal sample.

Data for Case 37814 SDG MC1GH3, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses, April 1993.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

TABLES 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLES 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORM(S)
APPENDIX C	CHAIN OF CUSTODY RECORD(S)
APPENDIX D	LABORATORY CASE NARRATIVE(S)

DCN: 37814_MC1GH3.IM2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37814, SDG MC1GH3

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
B	MC1GH3	J			> MDL < CRQL MSH (186%)
Hg	MC1GH3		UL	Low	HT (11 Days)
Ag	MC1GH3		UL	Low	MSL (68%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

>MDL <CRQL	=	Reported results are between MDL and CRQL and are considered estimated.
MSH	=	The matrix spike recovery was high (>125%) [the %recovery is in parenthesis]. The reported result may be biased high.
HT	=	Holding time was exceeded [# of days exceeded is in parenthesis]. Reported results and quantitation limits may be biased low.
MSL	=	The matrix spike recovery was low (>30 % but < 75%) [the %recovery is in parenthesis]. The quantitation limit may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODE

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page __1__ of __1__

Case #: 37814

SDG : MC1GH3

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 1

Lab. :

A4

Dissolved Metals

Sample Number :	MC1GH3										
Sampling Location :	BG08-SW-SW02S										
Matrix :	Water										
Units :	ug/L										
Date Sampled :	8/29/2008										
Time Sampled :	15:40										
Dilution Factor :	1.0										
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	531									
ANTIMONY	60										
*ARSENIC	10										
BARIUM	200										
BERYLLIUM	5										
BORON	50	38.2	J								
*CADMIUM	5										
CALCIUM	5000	24600									
*CHROMIUM	10										
COBALT	50										
COPPER	25										
IRON	100	265									
*LEAD	10										
MAGNESIUM	5000	8590									
MANGANESE	15	363									
MERCURY	0.2		UL								
MOLYBDENUM	5										
*NICKEL	40	14.6	J								
POTASSIUM	5000	4740	J								
SELENIUM	35										
SILVER	10		UL								
SODIUM	5000	24700									
THALLIUM	25										
VANADIUM	50										
ZINC	60	27.4	J								

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain-of-Custody Records



DAS No:

R

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By	(Date / Time)
Account Code:		Airbill:	961942978010	1	<i>Erik Armistead</i> 9/2/08 1700
CERCLIS ID:	VAN000306614	Shipped to:	A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277	2.	
Spill ID:	ALM			3.	
Site Name/State:	Battlefield Golf - 10% Split/VA			4.	
Project Leader:	Erik Armistead				
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (HNO3) (2)	BG08-GW-MP03S	S: 8/29/2008	10:00	--	
MC02L3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	9:10	--	
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (HNO3) (2)	BG08-GW-MW03S	S: 8/29/2008	14:50	--	
MC02L5 mc 1G143	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	916 (HNO3), 917 (HNO3) (2)	BG08-SW-SW02S	S: 8/29/2008	15:40	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	920 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	921 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	10:12	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:13	--	
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), 924 (Ice Only) (2)	BG08-SS-MP06S	S: 8/25/2008	15:07	--	
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 (Ice Only) (2)	BG08-SS-MP12S	S: 8/26/2008	10:20	--	

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

[illegible]

(b) (4)(b) (4)

U.S. EPA Region III Analytical Request Form

9/15-8-25-08

ASQAB USE ONLY		
RAS#	CT4354	Analytical TAT 14
DAS#		
NSF#		

37814

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 4	Matrix: soil -	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA-CLP

COVER PAGE

Lab Name: A4 Scientific, Inc. Contract: EPW06057
 Lab Code: A4 Case No: 37814 NRAS No.: 1629.0 SDG No: MC1GH3
 JW No.: ILM05.4

EPA Sample No.	Lab Sample ID
MC1GH3	0009589-01
MC1GH3D	0009589-01D
MC1GH3S	0009589-01S

	(Yes/No)	ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?		YES	YES
Were ICP-AES and ICP-MS background corrections applied?		YES	YES
If yes, were raw data generated before application of background corrections?		NO	NO

Comments: %D for Cu, Mn, Zn exceeds criteria for serial dilution. Interferences are suspected.

(b) (4)
(b) (4)

10.9.08

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4)

Name: (b) (4)(b) (4)

0000000001

Date: 10.9.08

Title: (b) (4)

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057

Case #: 37814

SDG #: MC1GH3

SDG NARRATIVE

SAMPLE RECIEPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

ICP-AES

Issue: The laboratory did not perform laboratory QC for Mercury for SDGs MC02L7 and MC1GH3; however, the laboratory has already performed laboratory QC for Mercury for SDGs MC02L2, MC02M1, and MC1GH0. The samples were received on 9/3/08 and the holding times have passed. 7

Resolution: Per Region 3, the laboratory performed laboratory QC for Mercury. Laboratory notified SMO of selected sample MC1GH3 as laboratory QC.

No other discrepancies or issues were noted during receipt and login.

pH of the water samples was verified upon sample receipt and is listed below:

EPA SAMPLE #	LAB SAMPLE #	pH-ICP-AES, Hg
MC1GH3	0009589-01	<2

ICP-AES

Water samples were digested by Hot-Block technique (HW1) and analyzed using a Thermo Electron ICAP6500.

MS was performed on sample "MC1GH3" and the %R for B was outside the QC limits. Post digestion spike was performed.

No problems were encountered during sample preparation or analysis.

DUP was performed on sample "MC1GH3" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed with in the contractual holding times.

MERCURY

Water samples were digested by Hot-Block technique (CW1) and analyzed using a Perkin Elmer FIMs-100

MS and DUP were performed on sample "MC1GH3" and they were within the QC limits. —

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed with in the contractual holding times.

0000000002

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057

Case #: 37814

SDG #: MC1GH3

SDG NARRATIVE

The following equations are used for calculation of sample results from raw instrument output data:

ICP-AES

Water Samples:

$$\text{Concentration } (\mu\text{g/L}) = C * \frac{V_f}{V_i} * DF$$

Where,

C = Instrument value in $\mu\text{g/L}$

V_f = Final digestion volume (mL) (50ml)

V_i = Initial digestion volume (mL) (50ml)

DF = Dilution Factor

MERCURY

WATER Samples:

A standard curve is prepared by plotting the instrumental response of processed standards against true concentration values. Using a linear regression equation, the concentration of field and Quality Control (QC) samples is determined.

000000003

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

Contractor Laboratory Acknowledgment Document

Analysis	Modification Reference Number	Hardcopy Turnaround Requirement	Preliminary Results (Y/N)	PDF Delivery (Y/N)	(A) Estimated No. of Samples by Matrix (including billable QC)	Cost For Modified Analysis	
						(B) New Per Sample Price	(A x B) Total Cost
ICP-AES 5-10 Metals (plus B and Mo)	1629.0	14 days	N	N	149 water	\$ _____	\$ _____
ICP-AES 11-22 Metals (plus B and Mo)	1629.0	14 days	N	N	28 water 39 soil	\$ _____	\$ _____
ICP-MS 11-16 Metals	N/A	14 days	N	N	149 water	\$ _____	\$ _____
Mercury	N/A	14 days	N	N	177 water 39 soil	\$ _____	\$ _____
						Total Project Cost	\$ _____

Project Information

Estimated Shipping Period: 8/29/2008 through 9/3/2008
 Additional Information: Please note that the samples will ship under two Cases.

Note: The requirements in the RFQ are as stated, and the Government will reduce the line item price listed on the bid sheet for late deliverables at a rate of 5 percent per calendar day late, up to a maximum of 50 percent. The Government will treat noncompliant data and late data for Preliminary Results in accordance with the terms and conditions of the contract, using the price listed on the bid sheet as the basis for the calculation.

Name of Contractor Laboratory: _____

Contract Number: _____

☐ Laboratory AGREES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.
☐ Laboratory DECLINES to perform analysis through the modified analysis protocol outlined in Modified Analysis Request.

Signature of Laboratory Representative: _____

Date: _____

Signature of USEPA Contracting Officer: _____

Date: _____

Analysis: Description of the analyses being requested by the USEPA for this Case. This column is completed by SMO.

Modification Reference Number: The numerical value assigned to the technical requirements describing the changes to the Statement of Work. This column is completed by SMO.

Hardcopy Turnaround Requirement: The analytical data turnaround time required for this Case. This column is completed by SMO.

Preliminary Results: Indicates if Preliminary Results are required for the line item. This column is completed by SMO.

PDF Delivery: Indicates if PDF Delivery is required for the line item. This column is completed by SMO.

Estimated No. of Samples and sample Matrix (including QC): The client's estimated number of samples (by matrix), including billable QC samples, to be collected and shipped to the laboratory. This column is completed by SMO.

New Per Sample Price: Laboratory's sample price for analyzing the samples identified in the line item. This column is completed by the laboratory.

Total Cost: This value is the Estimated No. of Samples (including QC) multiplied by the New Per Sample Price. This column is completed by the laboratory.

Total Project Cost: Sum of the total costs for all line items. This is completed by the laboratory.

SAMPLE LOG-IN SHEET

Lab Name A4 SCIENTIFIC, INC.				Page <u>1</u> of <u>1</u>	
Received By (Print Name) (b) (4)(b) (4)				Log-in Date 9-30-08	
Received By (Signature) (b) (4)(b) (4)					
Case Number 37814		Sample Delivery Group No. MC1GH3		NRAS Number 1629.0	
Remarks:		Corresponding			
		EPA Sample #	Aqueous Sample pH	Sample Tag #	Assigned Lab #
1. Custody Seal(s) Present/Absent* Intact/Broken		MC1GH3	< 2	916	9589.01
2. Custody Seal Nos. NA					
3. Traffic Reports/Chain of Custody Records or Packing Lists Present/Absent*					
4. Airbill Airbill/Sticker Present/Absent*					
5. Airbill No. 961942978010					
6. Sample Tags Present/Absent*					
Sample Tag Numbers Listed/Not Listed on Traffic Report/Chain of Custody Record					
7. Sample Condition Intact/Broken*/Leaking					
8. Cooler Temperature Indicator Bottle Present/Absent*					
9. Cooler Temperature 5°C					
10. Does information on Traffic Reports/Chain of Custody Records and sample tags agree? Yes/No*					
11. Date Received at Lab 9-3-08					
12. Time Received 10:02					
Sample Transfer					
Fraction DM AES, Hg		Fraction			
Area # Cooler A		Area #			
By AC		By			
On 9-3-08		On			

* Contact SMO and attach record of resolution

Reviewed By (b) (4)	Logbook No.
Date 9-30-08	Logbook Page No.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: October 17, 2008

SUBJECT: Region III Data QA Review

FROM: Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO: Christine Wagner
Regional Project Manager (3HS21)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case #: 37814; SDG#: MC02L2) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call Robin Danesi at (410)305-2607 or me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO: #0014 TDF: #1037

ANALYTICAL SERVICE AND QUALITY ASSURANCE BRANCH

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597



Date: October 16, 2008

Subject: Inorganic Data Validation (IM2 Level)
Case: 37814
SDG : MC02L2
Site : Battlefield Golf Club

From: (b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4)(b) (4)(b) (4) (b) (4)
Senior Oversight Chemist

To: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37814, Sample Delivery Group (SDG) MC02L2, consisted of four (4) aqueous samples analyzed for total metals by ICP-AES. In addition, boron (B) and molybdenum (Mo) were analyzed per modification reference number 1629.0. Samples were analyzed by A4 Scientific, Inc. (A4) according to the Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by an outlier present in the matrix spike analyses. The details of these outliers are discussed under "Minor Problem," specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Form (DSF).

MINOR PROBLEMS

The matrix spike recovery was low (<75% but >30%) for silver (Ag). Low recoveries may be attributed to matrix interferences or analyte lost during the digestion process. Quantitation limits for Ag in all samples may be biased low and have been qualified "UL" on the DSF.

The matrix spike recovery was high (>125%) for boron (B). Positive results for this analyte in affected samples may be biased high and have been qualified "K" unless superseded by "J" on the DSF.

NOTES

The post-digestion spike recovery was high (>125%) for B; however, data are not qualified based on the post-digestion spike recovery.

Reported results between Method Detection Limits (MDLs) and Contract Required Quantitation Limits (CRQLs) were qualified "J" on the DSFs.

Data for Case 37814, SDG MC02L2, were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

Table 1A	Summary of qualifiers on data summary forms after data validation
Table 1B	Codes used in comments column of Table 1A
Appendix A	Glossary of Data Qualifier Codes
Appendix B	Data Summary Form(s)
Appendix C	Chain of Custody Records
Appendix D	Laboratory Case Narrative

DCN: 37814_MC02L2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37814, SDG MC02L2

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
B	MC02L3	K		High	MSH (188%)
	MC02L2, MC02L4, MC02L5	J			>MDL<CRQL MSH (188%)
Ag	All samples		UL	Low	MSL (69%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

MSH	=	Matrix spike recovery was high (>125%) [percent recovery is in parenthesis]. Positive results may be biased high.
>MDL<CRQL	=	Reported results are greater than MDLs but less than CRQLs and are considered estimated.
MSL	=	Matrix Spike recovery was low (<75% but >30%) [percent recovery is in parenthesis]. Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B
Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 1

Case #: 37814

SDG : MC02L2

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 4

Lab. :

A4

Sample Number :		MC02L2		MC02L3		MC02L4		MC02L5			
Sampling Location :		BG08-GW-MP03S		BG08-GW-MP08S		BG08-GW-MW03S		BG08-SW-SW02S			
Matrix :		Water		Water		Water		Water			
Units :		ug/L		ug/L		ug/L		ug/L			
Date Sampled :		8/29/2008		8/29/2008		8/29/2008		8/29/2008			
Time Sampled :		10:00		09:10		14:50		15:40			
Dilution Factor :		1.0		1.0		1.0		1.0			
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	957		593		1350		622			
ANTIMONY	60										
*ARSENIC	10										
BARIUM	200										
BERYLLIUM	5										
BORON	50	25.1	J	54.1	K	29.4	J	39.9	J		
*CADMIUM	5										
CALCIUM	5000	63500		50600		62900		25900			
*CHROMIUM	10	5.3	J								
COBALT	50										
COPPER	25										
IRON	100	12800		13200		8540		422			
*LEAD	10										
MAGNESIUM	5000	34200		14300		19600		8940			
MANGANESE	15	151		163		197		378			
MERCURY	0.2										
MOLYBDENUM	5										
*NICKEL	40			18.8	J			15.2	J		
POTASSIUM	5000	5220		3150	J	3020	J	4990	J		
SELENIUM	35										
SILVER	10		UL		UL		UL		UL		
SODIUM	5000	22400		13500		26500		25900			
THALLIUM	25										
VANADIUM	50										
ZINC	60			102				28.0	J		

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain of Custody Records



DAS No:

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record		Sampler Signature:	<i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942978010	1	<i>Erik Armistead 9/2/08 1700</i>		
CERCLIS ID:	VAN000306614	Shipped to:	A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277	2			
Spill ID:	ALM			3			
Site Name/State:	Battlefield Golf - 10% Split/VA			4			
Project Leader:	Erik Armistead						
Action:	Preliminary Assessment						
Sampling Co:	Tetra Tech EM Inc.						

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (HNO3) (2)	BG08-GW-MP03S	S: 8/29/2008	10:00 ✓		--
MC02L3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	9:10 ✓		--
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (HNO3) (2)	BG08-GW-MW03S	S: 8/29/2008	14:50 ✓		--
MC02L5	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	916 (HNO3), 917 (HNO3) (2)	BG08-SW-SW02S	S: 8/29/2008	15:40 ✓		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	920 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	921 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	10:12		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:13		--
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), 924 (Ice Only) (2)	BG08-SS-MP06S	S: 8/25/2008	15:07		--
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 (Ice Only) (2)	BG08-SS-MP12S	S: 8/26/2008	10:20		--

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)

U.S. EPA Region III Analytical Request Form

975 8.25.08

ASQAB USE ONLY		
RAS#	CT4354	Analytical TAT 14
DAS#		
NSF#		

37814

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	Date Approved: 8/20/2008
EPA Project Leader: CHRIS WAGNER	Phone#:	Cell Phone #: 804-337-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOSHUA COPE	Phone#: 610-364-2130	Cell Phone #: 215-768-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK ARMISTEAD	Phone#: 610-364-2151	Cell Phone #: 267 446 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 4	Matrix: soil -	Parameter: TAL Metals + Boron + Molybdenum + Hg A4	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

Appendix D

Laboratory Case Narrative

USEPA-CLP

COVER PAGE

Lab Name: A4 Scientific, Inc. Contract: EPW06057
Lab Code: A4 Case No: 37814 NRAS No.: _____ SDG No: MC02L2
SOW No.: ILM05.4

EPA Sample No.

Lab Sample ID

MC02L20009541-01MC02L2D0009541-01DMC02L2S0009541-01SMC02L30009541-02MC02L40009541-03MC02L50009541-04

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u>NO</u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____

(b) (4)Name: *for* _____**(b) (4)(b) (4)(b) (4)**

0000000001

Date: _____

10-7-08

Title: _____

(b) (4)(b) (4)(b) (4)

CHEMIST

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057

Case #: 37814

SDG #: MC02L2

SDG NARRATIVE

SAMPLE RECEIPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

ICP-AES

HG-Mercury

No other discrepancies or issues were noted during receipt and login.

pH of the water samples was verified upon sample receipt and is listed below:

EPA SAMPLE #	LAB SAMPLE #	pH-ICP-AES, Hg
MC02L2	0009541-01	<2
MC02L3	0009541-02	<2
MC02L4	0009541-03	<2
MC02L5	0009541-04	<2

MERCURY

Water samples were digested by Hot-Block technique (CW1) and analyzed using a Perkin Elmer FIMS-100

MS and DUP were performed on sample "MC02L2" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed within the contractual holding times.

ICP-AES

Water Samples were digested by Hot-Block technique (HW1) and analyzed using a Thermo Electron ICAP6500.

MS and DUP were performed on sample "MC02L2" and they were within the QC limits.

The Serial dilution was performed on sample "MC02L2" and it was within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed within the contractual holding times.

000000002

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057	Case #: 37814	SDG #: MC02L2
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SDG NARRATIVE

The following equations are used for calculation of sample results from raw instrument output data:

MERCURY

WATER Samples:

A standard curve is prepared by plotting the instrumental response of processed standards against true concentration values. Using a linear regression equation, the concentration of field and Quality Control (QC) samples is determined.

ICP-AES

WATER Samples:

$$\text{Concentration } (\mu\text{g/L}) = C * \frac{V_f}{V_i} * DF$$

Where,

C = Instrument value in $\mu\text{g/L}$

V_f = Final digestion volume (mL) (50ml)

V_i = Initial digestion volume (mL) (50ml)

DF = Dilution Factor



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MARYLAND 20755-5350

DATE : October 15, 2008

SUBJECT: Region III Data QA Review

FROM : Colleen Walling *Colleen C. Walling*
Region III ESAT RPO (3EA20)

TO : Christine Wagner
Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Gulf Club site (Case # 37814 SDG #MC02L7) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call me at (410) 305-2763.

Attachment

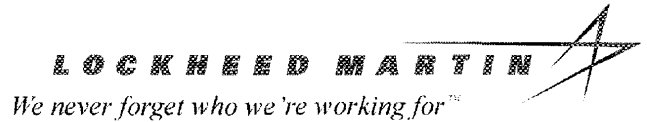
cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 1035

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597



Date: October 15, 2008

Subject: Inorganic Data Validation (IM2 Level)
Case: 37814
SDG : MC02L7
Site : Battlefield Golf Club

From: (b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4)(b) (4)(b) (4) (b) (4)
Senior Oversight Chemist

To: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37814, Sample Delivery Group (SDG) MC02L7, consisted of four (4) aqueous samples analyzed for aluminum (Al), calcium (Ca), iron (Fe), magnesium (Mg), mercury (Hg), potassium (K) and sodium (Na) by ICP-AES. In addition, boron (B) and molybdenum (Mo) were analyzed per modification reference number 1629.0. Samples were analyzed by A4 Scientific, Inc. (A4) according to the Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by an outlier present in the matrix spike analysis. The detail of this outlier is discussed under "Minor Problem," specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Form (DSF).

MINOR PROBLEM

The matrix spike recovery was high (>125%) for B. Positive results for this analyte in all samples may be biased high and have been qualified "K" unless superseded by "J" on the DSF.

NOTES

Reported results between Method Detection Limits (MDLs) and Contract Required Quantitation Limits (CRQLs) were qualified "J" on the DSFs.

Data for Case 37814, SDG MC02L7, were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

Table 1A	Summary of qualifiers on data summary forms after data validation
Table 1B	Codes used in comments column of Table 1A
Appendix A	Glossary of Data Qualifier Codes
Appendix B	Data Summary Form(s)
Appendix C	Chain of Custody Records
Appendix D	Laboratory Case Narrative

DCN: 37814_MC02L7

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37814, SDG MC02L7

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
B	MC02L9	K		High	MSH (183%)
	All samples except MC02L9	J			>MDL<CRQL MSH (183%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

MSH	=	Matrix spike recovery was high (>125%) [percent recovery is in parenthesis]. Positive results may be biased high.
>MDL<CRQL	=	Reported results are greater than MDLs but less than CRQLs and are considered estimated.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 1

Case #: 37814

SDG (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 4

Lab. :

A4

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/27/2008	8/25/2008	8/29/2008	8/26/2008							
Time Sampled :	14:21	20:15	10:12	10:13							
Dilution Factor :	1.0	1.0	1.0	1.0							
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200					545					
BORON	50	30.1	J	28.5	J	174	K	33.6	J		
CALCIUM	5000	143000		51700		26900		18700			
IRON	100	992		8320		155		2800			
MAGNESIUM	5000	9990		23900		14900		3350	J		
MERCURY	0.2										
MOLYBDENUM	5										
POTASSIUM	5000			3260	J	10900		2120	J		
SODIUM	5000	24300		52300		83600		54900			

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C

Chain of Custody Records



R

37814

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By (Date / Time)	Received By (Date / Time)
Account Code:		Airbill:	961942978010	1 <i>Erik Armistead</i> 9/2/08 1700	
CERCLIS ID:	VAN000306614	Shipped to:	A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277	2.	
Spill ID:	ALM			3.	
Site Name/State:	Battlefield Golf - 10% Split/VA			4.	
Project Leader:	Erik Armistead				
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (HNO3) (2)	BG08-GW-MP03S	S: 8/29/2008	10:00	--	
MC02L3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	9:10	--	
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (HNO3) (2)	BG08-GW-MW03S	S: 8/29/2008	14:50	--	
MC02L5	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	916 (HNO3), 917 (HNO3) (2)	BG08-SW-SW02S	S: 8/29/2008	15:40	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/27/2008	14:21 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	920 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/25/2008	20:15 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	921 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/29/2008	10:12 ✓	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)	(b) (6)/(b) (6)	S: 8/26/2008	10:13 ✓	--	
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), 924 (Ice Only) (2)	BG08-SS-MP06S	S: 8/25/2008	15:07	--	
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 (Ice Only) (2)	BG08-SS-MP12S	S: 8/26/2008	10:20	--	

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy To: (b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)

U.S. EPA Region III Analytical Request Form

975-8-25-08

ASQAB USE ONLY		
RAS#	CT4354	Analytical TAT
DAS#		14
NSF#		

37814

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
		Date Approved: 8/20/2008	
EPA Project Leader: CHRIS WAGNER	Phone#:	Cell Phone #: 804-337-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOSHUA COPE	Phone#: 610-364-2130	Cell Phone #: 215-768-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK ARMISTEAD	Phone#: 610-364-2151	Cell Phone #: 267 446 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 4	Matrix: soil	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
		Inorg. Validation Level IM2	
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days			
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

Appendix D

Laboratory Case Narrative

USEPA-CLP

COVER PAGE

Lab Name: A4 Scientific, Inc. Contract: EPW06057
Lab Code: A4 Case No: 37814 NRAS No.: 1629.0 SDG No: MC02L7
SOW No.: ILM05.4

EPA Sample No.	Lab Sample ID
<u>MC02L7</u>	<u>0009556-01</u>
<u>MC02L7D</u>	<u>0009556-01D</u>
<u>MC02L7S</u>	<u>0009556-01S</u>
<u>MC02L8</u>	<u>0009556-02</u>
<u>MC02L9</u>	<u>0009556-03</u>
<u>MC02M0</u>	<u>0009556-04</u>

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u>NO</u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4)

Name: (b) (4)(b) (4)

Date: 10. 8. 08

Title: (b) (4)(b) (4)

000000001

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057	Case #: 37814	SDG #: MCO2L7
----------------------	---------------	---------------

SDG NARRATIVE

SAMPLE RECIEPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

No other discrepancies or issues were noted during receipt and login.

pH of the water samples was verified upon sample receipt and is listed below:

EPA SAMPLE #	LAB SAMPLE #	pH- AES, Hg
MC02L7	0009556-01	<2
MC02L8	0009556-02	<2
MC02L9	0009556-03	<2
MC02M0	0009556-04	<2

ICP-AES

Water samples were digested by Hot-Block technique (HW1) and analyzed using a Thermo Electron ICAP6500.

MS was performed on sample "MC02L7" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

DUP was performed on sample "MC02L7" and they were within the QC limits.

Serial Dilution was performed on sample "MC02L7" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed with in the contractual holding times.

MERCURY

Water samples were digested by Hot-Block technique (CW1) and analyzed using a Perkin Elmer FIMS-100

MS and DUP were performed on sample "MC02L7" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed with in the contractual holding times.

000000002

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057	Case #: 37814	SDG #: MCO2L7
----------------------	---------------	---------------

SDG NARRATIVE

The following equations are used for calculation of sample results from raw instrument output data:

ICP-AES

Water Samples:

$$\text{Concentration } (\mu\text{g/L}) = C * \frac{V_f}{V_i} * DF$$

Where,

C = Instrument value in $\mu\text{g/L}$

V_f = Final digestion volume (mL) (50ml)

V_i = Initial digestion volume (mL) (50ml)

DF = Dilution Factor

MERCURY

Water Samples:

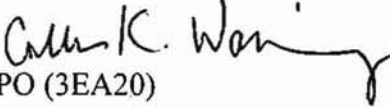
A standard curve is prepared by plotting the instrumental response of processed standards against true concentration values. Using a linear regression equation, the concentration of field and Quality Control (QC) samples is determined.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: October 17, 2008

SUBJECT: Region III Data QA Review

FROM: Colleen Walling 
Region III ESAT RPO (3EA20)

TO: Christine Wagner
Regional Project Manager (3HS21)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case #: 37814; SDG#: MC02L8) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call Robin Danesi at (410)305-2607 or me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO: #0014 TDF: #1047

ANALYTICAL SERVICE AND QUALITY ASSURANCE BRANCH

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597

DATE: October 16, 2008

SUBJECT: Level IM2 Inorganic Data Validation for Case 37814
SDG: MC02L8
Site: Battlefield Golf Club

FROM: (b) (4)
Inorganic Data Reviewer

Through: (b) (4)(b) (4)(b) (4)
Senior Data Review Chemist

TO: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37814, Sample Delivery Group (SDG) MC02L8, consisted of four (4) aqueous samples analyzed for total metals by the ICP-MS method. The sample set included no field Quality Control (QC) sample. All samples were submitted to A4 Scientific, Inc. (A4) for analyses. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to the Region III Modifications to the National Functional Guidelines for Inorganic Data Review, level IM2. Areas of concern with respect to data usability are listed below.

Data in this Case have been impacted by outliers present in the laboratory blank as well as matrix spike and the ICP serial dilution analyses. Details for these outliers are discussed under "Minor Problems", specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on a single Data Summary Form (DSF).

MINOR PROBLEMS

The Continuing Calibration Blank (CCB) had a reported result greater than the Method Detection Limit (MDL) for antimony (Sb). The reported result for this analyte in sample MC02L7 was less than five (<5) times the blank concentration may be biased high and has been qualified "B" on the DSF.

The matrix spike recovery was low (<75% but > 30%) for silver (Ag). The low recovery may be attributed to matrix interferences or analyte lost during the digestion process. Quantitation limits for this analyte in affected samples in this SDG may be biased low and have been qualified "UL" on the DSF.

The Percent Differences (%Ds) for ICP serial dilution analysis were outside control limits (>10%) for copper (Cu), manganese (Mn), and zinc (Zn). Reported positive results regarding these analytes are estimated and have been qualified "J" on the DSF.

NOTES

Positive results which are less than the Contract Required Quantitation Limits (CRQLs) but greater than MDLs have been qualified "J" on the DSF unless superseded by "B".

The Laboratory Chain-of-Custody (COC) records requested analyses for boron (B) and molybdenum (Mo). These analytes were analyzed in SDG MC02L7.

Data for Case 37814, SDG MC02L8, were reviewed in accordance with Region III Modifications to the National Functional Guidelines for Evaluating Inorganic Analyses, April 1993.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

TABLES 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLES 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORM(S)
APPENDIX C	CHAIN OF CUSTODY RECORD(S)
APPENDIX D	LABORATORY CASE NARRATIVE(S)

DCN: 37814_ MC02L8. IM2

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37814, SDG MC02L8

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	MC02L7	B		High	CCB (1.446 J ug/L)
Cu	All samples	J			SD (13%)
Mn	All Samples	J			SD (13%)
Ag	All Samples		UL	Low	MSL (60%)
Zn	All Samples	J			SD (18%)

- See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

CCB	=	The continuing calibration blank had reported results greater than the MDL [the result is in parenthesis]. Reported results which are less than or equal to five times ($\leq 5X$) the blank concentration may be biased high.
SD	=	Percent differences (%Ds) for the ICP serial dilution analysis were outside the (10%) control limit. [%Ds are in parenthesis]. Positive results are estimated.
MSL	=	The matrix spike recovery was low ($>30\%$ but $<75\%$) [the %recovery is in parenthesis]. Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODE

Q = No analytical result.

Appendix B

Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page __1__ of __1__

Case #: 37814

SDG (b) (6)

Number of Soil Samples : 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples : 4

Lab. :

A4

Sample Number :	(b) (6)	(b) (6)	(b) (6)	(b) (6)	(b) (6)						
Sampling Location :	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)	(b) (6)(b) (6)						
Matrix :	Water	Water	Water	Water	Water						
Units :	ug/L	ug/L	ug/L	ug/L	ug/L						
Date Sampled :	8/27/2008	8/25/2008	8/29/2008	8/26/2008							
Time Sampled :	14:21	20:15	10:12	10:13							
Dilution Factor :	1.0	1.0	1.0	1.0							
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	1.4	B								
*ARSENIC	1	1.4		1.1		1.0		2.4			
BARIUM	10	21.4		17.3				58.3			
BERYLLIUM	1							0.42	J		
*CADMIUM	1										
*CHROMIUM	2										
COBALT	1							7.9			
COPPER	2	182	J	14.7	J	226	J	15.6	J		
*LEAD	1	8.7		1.4		30.2		10.0			
MANGANESE	1	155	J	243	J	3.7	J	101	J		
*NICKEL	1					2.3		6.4			
SELENIUM	5										
SILVER	1		UL		UL		UL		UL		
THALLIUM	1										
VANADIUM	5										
ZINC	2	81.6	J	16.8	J	365	J	27.7	J		

CRQL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor)

Revised 09/99

Appendix C
Chain-of-Custody Records



DAS No:

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record	Sampler Signature: <i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By	(Date / Time)
Account Code:		Airbill:	961942978010	1	<i>Erik Armistead</i> 9/2/08 1700
CEACLS ID:	VAN000306614	Shipped to:	A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277	2	
Spill ID:	ALM			3	
Site Name/State:	Battlefield Golf - 10% Split/VA			4	
Project Leader:	Erik Armistead				
Action:	Preliminary Assessment				
Sampling Co:	Tetra Tech EM Inc.				

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (HNO3) (2)	BG08-GW-MP03S	S: 8/29/2008	10:00		--
MC02L3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	9:10		--
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (HNO3) (2)	BG08-GW-MW03S	S: 8/29/2008	14:50		--
MC02L5	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	916 (HNO3), 917 (HNO3) (2)	BG08-SW-SW02S	S: 8/29/2008	15:40		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21		--
(b) (6)	Potable Well/ Enk Armistead	M/G	TAL TM+B+M (14)	920 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	921 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	10:12		--
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:13		--
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), 924 (Ice Only) (2)	BG08-SS-MP06S	S: 8/25/2008	15:07		--
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 (Ice Only) (2)	BG08-SS-MP12S	S: 8/26/2008	10:20		--

Shipment for Case Complete? Y	Sample(s) to be used for Laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

TR Number: 3-375524367-090108-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: (b) (4)(b) (4)(b) (4)(b) (4)(b) (4) (b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)(b) (4)

(b) (4)(b) (4)

U.S. EPA Region III Analytical Request Form

9/5-8.25.08

ASQAB USE ONLY		
RAS#	CT4354	Analytical TAT 14
DAS#		
NSF#		

37814

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 4	Matrix: soil -	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Appendix D

Laboratory Case Narrative

USEPA-CLP

COVER PAGE

Lab Name: A4 Scientific, Inc. Contract: EPW06057
Lab Code: A4 Case No: 37814 NRAS No.: _____ SDG No: MC02L8
SOW No.: ILM05.4

EPA Sample No.	Lab Sample ID
<u>MC02L7</u>	<u>0009557-01</u>
<u>MC02L7D</u>	<u>0009557-01D</u>
<u>MC02L7S</u>	<u>0009557-01S</u>
<u>MC02L8</u>	<u>0009557-02</u>
<u>MC02L9</u>	<u>0009557-03</u>
<u>MC02M0</u>	<u>0009557-04</u>

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u>NO</u>

Comments: %D for Cu, Mn, Zn exceeds criteria for serial dilution. Interferences are suspected.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4)

Name: (b) (4)(b) (4)

Date: 10 08 08

Title: (b) (4)

000000001

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057	Case #: 37814	SDG #: MCO2L7
----------------------	---------------	---------------

SDG NARRATIVE

SAMPLE RECEIPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

No other discrepancies or issues were noted during receipt and login.

pH of the water samples was verified upon sample receipt and is listed below:

EPA SAMPLE #	LAB SAMPLE #	pH- ICP-MS, Hg
MC02L7	0009557-01	<2
MC02L8	0009557-02	<2
MC02L9	0009557-03	<2
MC02M0	0009557-04	<2

ICP-MS

Water samples were digested by Hot-Block technique (HW3) and analyzed using a Thermo Electron Corporation ICP MS model X-II.

No problems were encountered during sample preparation or analysis.

MS and DUP were performed on sample "MC02L7" and they were within the QC limits.

Analytes with Serial Dilution percent difference not within the control limits are flagged with "E" on Form1s and Form8.

All samples were prepared and analyzed with in the contractual holding times.

MERCURY

Water samples were digested by Hot-Block technique (CW1) and analyzed using a Perkin Elmer FIMs-100

MS and DUP were performed on sample "MC02L7" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed with in the contractual holding times.

000000002

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057	Case #: 37814	SDG #: MCO2L7
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SDG NARRATIVE

The following equations are used for calculation of sample results from raw instrument output data:

ICP-MS

Water Samples:

$$\text{Concentration } (\mu\text{g/L}) = C * \frac{V_f}{V_i} * DF$$

Where,

C = Instrument value in $\mu\text{g/L}$ (The average of all replicate integrations).

V_f = Final digestion volume (mL) (50ml)

V_i = Initial digestion volume (mL) (50ml)

DF = Dilution Factor

MERCURY

Water Samples:

A standard curve is prepared by plotting the instrumental response of processed standards against true concentration values. Using a linear regression equation, the concentration of field and Quality Control (QC) samples is determined.

SAMPLE LOG-IN SHEET

Lab Name A4 SCIENTIFIC, INC. Page 1 of 1

Received By (Print Name) (b) (4)(b) (4) Log-in Date 9-3-08

Received By (Signature) (b) (4)

Case Number 37814 Sample Delivery Group No. MC02L8 NRAS Number

Remarks:	EPA Sample #	Aqueous Sample pH	Corresponding		Remarks: Condition of Sample Shipment, etc.
			Sample Tag #	Assigned Lab #	
1. Custody Seal(s) <u>Present/Absent*</u> <u>Intact/Broken</u>	<u>MC02L7</u>	<u>2</u>	<u>919</u>	<u>9557-01</u>	<u>1500 mL Plastic</u>
2. Custody Seal Nos. <u>NA</u>	<u>L8</u>	<u>↓</u>	<u>920</u>	<u>-02</u>	<u>↓</u>
3. Traffic Reports/Chain of Custody Records or Packing Lists <u>Present/Absent*</u>	<u>L9</u>	<u>↓</u>	<u>921</u>	<u>-03</u>	<u>↓</u>
4. Airbill <u>Airbill/Sticker Present/Absent*</u>	<u>MO</u>	<u>↓</u>	<u>922</u>	<u>-04</u>	<u>↓</u>
5. Airbill No. <u>961942978010</u>					
6. Sample Tags <u>Present/Absent*</u> Sample Tag Numbers <u>Listed/Not Listed</u> <u>On Traffic Report/Chain of Custody Record</u>					
7. Sample Condition <u>Intact/Broken*/Leaking</u>					
8. Cooler Temperature Indicator Bottle <u>Present/Absent*</u>					
9. Cooler Temperature <u>5°</u>					
10. Does information on Traffic Reports/Chain of Custody Records and sample tags agree? <u>Yes/No*</u>					
11. Date Received at Lab <u>9-3-08</u>					
12. Time Received <u>10:02</u>					

Sample Transfer	
Fraction <u>MS</u>	Fraction <u>7</u>
Area # <u>Cooler A</u>	Area #
By <u>Ac</u>	By
On <u>9-3-08</u>	On

* Contact SMO and attach record of resolution

Reviewed By (b) (4) Logbook No. 0000000001
 Date 9.11.08 Logbook Page No.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Environmental Sciences Center
701 Mapes Road
Fort Meade, Maryland 20755-5350

DATE: October 17, 2008

SUBJECT: Region III Data QA Review

FROM: Colleen Walling *Colleen K. Walling*
Region III ESAT RPO (3EA20)

TO: Christine Wagner
Regional Project Manager (3HS21)

Attached is the inorganic data validation report for the Battlefield Golf Club site (Case #: 37814; SDG#: MC02M1) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III EAID.

If you have any questions regarding this review, please call Robin Danesi at (410)305-2607 or me at (410) 305-2763.

Attachment

cc: Joshua Cope (TTEMI)

TO: #0014 TDF: #1036

ANALYTICAL SERVICE AND QUALITY ASSURANCE BRANCH

Lockheed Martin Enterprise Solutions & Services
ESAT Region 3
US EPA Environmental Science Center
701 Mapes Road Ft. Meade, MD 20755-5350
Telephone 410-305-3037 Facsimile 410-305-3597



Date: October 16, 2008

Subject: Inorganic Data Validation (IM2 Level)
Case: 37814
SDG : MC02M1
Site : Battlefield Golf Club

From: (b) (4) (b) (4)
Inorganic Data Reviewer

(b) (4) (b) (4)
Senior Oversight Chemist

To: Colleen Walling
ESAT Region 3 Project Officer

OVERVIEW

Case 37814, Sample Delivery Group (SDG) MC02M1, consisted of two (2) soil samples analyzed for total metals by ICP-AES. In addition, boron (B) and molybdenum (Mo) were analyzed per modification reference number 1629.0. Samples were analyzed by A4 Scientific, Inc. (A4) according to the Contract Laboratory Program (CLP) Statement of Work (SOW) ILM05.4 through the Routine Analytical Services (RAS) program.

SUMMARY

Data were validated according to Region III Modifications to the National Functional Guidelines for Inorganic Data Review, Level IM2. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by expiration of holding time and an outlier present in the matrix spike analysis. The detail of this outlier is discussed under "Minor Problem," specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on the Data Summary Form (DSF).

MINOR PROBLEMS

The holding time of twenty eight (28) days from the time of sample collection to sample analysis for mercury (Hg) has been exceeded by ten (10) days for sample MC02M1 and nine (9) days for sample MC02M3. Quantitation limits for this analyte in both samples may be biased low and has been qualified "UL" on the DSF.

The matrix spike recovery was low (<75% but >30%) for silver (Ag). Low recoveries may be attributed to matrix interferences or analyte lost during the digestion process. Quantitation limits for Ag in both samples may be biased low and have been qualified "UL" on the DSF.

NOTES

The matrix spike recovery was high (>125%) for boron (B). As there were no positive results for this analyte in either sample, no data were qualified based on this outlier.

The Relative Percent Difference (RPD) in the laboratory duplicate analysis was outside contractual control limits (20% RPD, \pm CRQL) for iron (Fe) and manganese (Mn). However, the RPD for these analytes were within Region 3 established control limits (35% RPD, \pm 2XCRQL) for soil analysis. No data were qualified for these analytes based on laboratory duplicate imprecision.

Reported results between Method Detection Limits (MDLs) and Contract Required Quantitation Limits (CRQLs) were qualified "J" on the DSFs.

Data for Case 37814, SDG MC02M1, were reviewed in accordance with the National Functional Guidelines for Evaluating Inorganic Analyses with Modifications for use within Region III.

ATTACHMENTS**INFORMATION REGARDING REPORT CONTENT**

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

Table 1A	Summary of qualifiers on data summary forms after data validation
Table 1B	Codes used in comments column of Table 1A
Appendix A	Glossary of Data Qualifier Codes
Appendix B	Data Summary Form(s)
Appendix C	Chain of Custody Records
Appendix D	Laboratory Case Narrative

DCN: 37814_MC02M1

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

Case 37814, SDG MC02M1

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Hg	MC02M1, MC02M3		UL	Low	HT (10, 9 days)
Ag	MC02M1, MC02M3		UL	Low	MSL (66%)

* See explanation of comments in Table 1B

TABLE 1B
CODES USED IN COMMENTS COLUMN

HT	=	The technical holding time from time of sample collection to sample analysis/digestion was exceeded [days exceeded is in parenthesis]. Quantitation limits may be biased low.
MSL	=	Matrix Spike recovery was low (<75% but >30%) [percent recovery is in parenthesis]. Quantitation limits may be biased low.

Appendix A

Glossary of Data Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

Appendix B
Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 1

Case #: 37814

SDG : MC02M1

Number of Soil Samples : 2

Site :

Battlefield Golf Club

Number of Water Samples : 0

Lab. :

A4

Sample Number :		MC02M1		MC02M3							
Sampling Location :		BG08-SS-MP06S		BG08-SS-MP12S							
Matrix :		Soil		Soil							
Units :		mg/Kg		mg/Kg							
Date Sampled :		8/25/2008		8/26/2008							
Time Sampled :		15:07		10:20							
%Solids :		86.6		78.3							
Dilution Factor :		1.0		1.0							
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	20	2060		1000							
ANTIMONY	6										
ARSENIC	1	1.2									
BARIUM	20	13.8	J								
BERYLLIUM	0.5										
BORON	5										
CADMIUM	0.5										
CALCIUM	500	238	J								
CHROMIUM	1	6.5		1.4							
COBALT	5										
COPPER	2.5	15.9									
IRON	10	2550		319							
*LEAD	1	1.9									
MAGNESIUM	500	538	J								
MANGANESE	1.5	15.9		2.5							
MERCURY	0.1		UL		UL						
MOLYBDENUM	0.5	0.88									
NICKEL	4	3.1	J								
POTASSIUM	500	332	J								
SELENIUM	3.5										
SILVER	1		UL		UL						
SODIUM	500										
THALLIUM	2.5										
VANADIUM	5	6.6									
ZINC	6	7.6									

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

Appendix C

Chain of Custody Records



DAS No:

Region:	3	Date Shipped:	9/2/2008	Chain of Custody Record		Sampler Signature:	<i>Erik Armistead</i>
Project Code:	CT4354	Carrier Name:	FedEx	Relinquished By	(Date / Time)	Received By	(Date / Time)
Account Code:		Airbill:	961942978010	1	<i>Erik Armistead</i> 9/2/08 1700		
CERCLIS ID:	VAN000306614	Shipped to:	A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277	2			
Spill ID:	ALM			3			
Site Name/State:	Battlefield Golf - 10% Split/VA			4			
Project Leader:	Erik Armistead						
Action:	Preliminary Assessment						
Sampling Co:	Tetra Tech EM Inc.						

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC02L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (HNO3) (2)	BG08-GW-MP03S	S: 8/29/2008	10:00	--	
MC02L3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (HNO3) (2)	BG08-GW-MP08S	S: 8/29/2008	9:10	--	
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (HNO3) (2)	BG08-GW-MW03S	S: 8/29/2008	14:50	--	
MC02L5	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	916 (HNO3), 917 (HNO3) (2)	BG08-SW-SW02S	S: 8/29/2008	15:40	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)	(b) (6)(b) (6)	S: 8/27/2008	14:21	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	920 (HNO3) (1)	(b) (6)(b) (6)	S: 8/25/2008	20:15	--	
(b) (6)(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	921 (HNO3) (1)	(b) (6)(b) (6)	S: 8/29/2008	10:12	--	
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)	(b) (6)(b) (6)	S: 8/26/2008	10:13	--	
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), 924 (Ice Only) (2)	BG08-SS-MP06S	S: 8/25/2008	15:07	--	
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 (Ice Only) (2)	BG08-SS-MP12S	S: 8/26/2008	10:20	--	

Shipment for Case Complete? Y	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
TAL DM+B+M = TAL Diss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly			

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

F2V5.1.047 Page 1 of 1

U.S. EPA Region III Analytical Request Form

9/5 8.25 08

ASQAB USE ONLY		
RAS#	CT4354	Analytical TAT
DAS#		14
NSF#		

37814

Date: 8/21/2008		Site Activity: Removal Assessment	
Site Name: Battlefield Golf Club		Street Address: 1001 South Centerville Turnpike	
City: Chesapeake	State: VA	Latitude: 36.68982	Longitude: 76.17790
Program: Superfund	Acct. #: 2008T03 N 302DC6C A3LM RS00	CERCLIS #: VAN000306614	
Site ID:	Spill ID: A3LM	Operable Unit:	
Site Specific QA Plan Submitted: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		Title: Battlefield Golf Club Fly Ash Assessment SAP	
EPA Project Leader: CHRIS WAGNER		Phone#:	Cell Phone #: 804-337-3049
Request Preparer: JOSHUA COPE		Phone#: 610-364-2130	Cell Phone #: 215-768-8114
Site Leader: ERIK ARMISTEAD		Phone#: 610-364-2151	Cell Phone #: 267 446 2837
Contractor: Tetra Tech EM Inc		EPA CO/PO: Lorrie Murray/Karen Wodarczyk	
#Samples 4	Matrix: soil -	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: groundwater	Parameter: TAL Metals + Boron + Molybdenum + Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potable water	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potable water	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater	Parameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: groundwater	Parameter: Al, Ca, Fe, K, Mg, Na	Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter:	Method:
#Samples	Matrix:	Parameter:	Method:
Ship Date From: 8/29/2008		Ship Date To: 9/3/2008	Org. Validation Level
Unvalidated Data Requested: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes		If Yes, TAT Needed: <input type="checkbox"/> 24hrs <input type="checkbox"/> 48hrs <input type="checkbox"/> 72hrs <input type="checkbox"/> 7days <input checked="" type="checkbox"/> Other (Specify) 14 days	
Validated Data Package Due: <input type="checkbox"/> 14 days <input type="checkbox"/> 21 days <input checked="" type="checkbox"/> 30days <input type="checkbox"/> 42 days <input type="checkbox"/> Other (Specify)			
Electronic Data Deliverables Required: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes (EDDs will be provided in Region 3 EDD Format)			
Special Instructions: See attached DLs.			

Anal_req_form

Request for Quote (RFQ) for Modified Analysis

Date: August 27, 2008

Subject: Modification Reference Number: 1629.0
Title: ICP-AES Metals with Boron and Molybdenum
Sample Matrix: Water and Soil
Fraction Affected: Metals
Statement of Work: ILM05.4

Purpose:

The Contractor Laboratory is requested to perform the following modified analyses under the Inorganic Statement of Work (SOW) ILM05.4, based on the additional specifications listed below. Unless specifically modified by this modification, all analyses, Quality Control (QC), and reporting requirements specified in SOW ILM05.4 remain unchanged and in full force and effect. The number of samples requested in this modification is not guaranteed.

Please note that accepting a modified analysis request is voluntary, and that the Laboratory is not required to accept the modified analysis. There will be no adverse effect to the Laboratory for not accepting the modified analysis request. However, once the Laboratory accepts the request for modified analysis, it shall perform the analysis in accordance with this modification and as specified in SOW ILM05.4.

The Laboratory is requested to review the modification described herein, determine whether or not it shall accept the requested modified analyses, and complete the attached response form. The Laboratory shall provide comments in response to the required changes in the designated area, in order to ensure that the modified analysis can be completed in accordance with the specifications described herein.

Notice to Contractors: Acceptance of Modified Analysis samples will not count against the monthly capacity.

Modification to the SOW Specifications:

The contract Laboratory shall analyze aqueous/water and soil/sediment samples for target analytes and the additional analytes Boron (B, CASRN 7440-42-8) and Molybdenum (Mo, CASRN 7439-98-7) by ICP-AES as indicated on the Traffic Report/Chain of Custody Record.

Analyte	Water CRQL (ug/L)	Soil CRQL (mg/kg)	Water Spike level (ug/L)	Soil Spike level (mg/kg)
B	50	5.0	250	25
Mo	5	0.5	25	2.5

The Laboratory must submit Method Detection Limits (MDL) for Boron and Molybdenum that are less than one-half the CRQLs.

The Laboratory shall not use borosilicate glassware to digest the samples for metals analysis or prepare any sample dilutions to avoid contaminating samples with Boron. Polymer digestion vessels shall be used instead.

Post-digestion Spike requirements are per the SOW.

The Laboratory shall add Boron and Molybdenum to the ICV/CCV solutions at appropriate concentrations.

The Laboratory shall add Boron and Molybdenum to the CRI solution at the requested aqueous CRQLs.

The Laboratory shall add Boron and Molybdenum to the LCSW at the levels requested for Matrix Spike if they are not already present in the solution. The Laboratory is not required to add Boron and Molybdenum to the LCSS if they are not already present.

The Laboratory is not required to add Boron and Molybdenum to the ICSA/ICSAB solutions. The Laboratory shall use a true value of zero (0) and acceptance windows of +/- 2 times the CRQL, unless a non-zero value for these analytes has been determined for the solution(s).

The Laboratory shall add Boron and Molybdenum to Forms 1, 2A, 2B, 3, 4A, 5A, (5B), 6, 8, 9, 10A, 11, and 13

Reporting Requirements:

Hardcopy and electronic data reporting are required as specified per SOW ILM05.4. All hardcopy and electronic data shall be adjusted to incorporate modified specifications. This includes attaching a copy of the requirements for modified analysis to the SDG Narrative. If specific problems occur with incorporation of the modified analysis into the hardcopy and/or electronic deliverable, the Laboratory shall contact the DASS Manager within the Sample

Management Office (SMO) at (b) (4)(b) (4) or via email at (b) (4)(b) (4)(b) (4) for resolution.

All samples and/or fractions assigned to an SDG shall be analyzed under the same Modified Analysis requirements as established in this memorandum. The Laboratory shall not include data from multiple Modified Analyses in one SDG.

The Laboratory shall include the Modification Reference Number 1629.0 on each hardcopy data form under the "NRAS No:" header appearing on each form as well as the "NRAS No." field on the Record type 21 of the electronic deliverable (if diskette deliverable is required). The Laboratory shall also document the Modification Reference Number and Solicitation Number on the SDG Coversheet.

Clarifications/Revisions to the RFQ for Modified Analysis:

Laboratory Name:

Laboratory Comments:

Appendix D

Laboratory Case Narrative

USEPA-CLP

COVER PAGE

Lab Name: A4 Scientific, Inc. Contract: EPW06057
Lab Code: A4 Case No: 37814 NRAS No.: 1629.0 SDG No: MCO2M1
SOW No.: ILM05.4

EPA Sample No.

Lab Sample ID

MC02M10009543-01MC02M1D0009543-01DMC02M1S0009543-01SMC02M30009543-02

		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
Were ICP-AES and ICP-MS background corrections applied?	(Yes/No)	<u>YES</u>	<u>YES</u>
If yes, were raw data generated before application of background corrections?	(Yes/No)	<u>NO</u>	<u>NO</u>

Comments: _____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette (or via an alternate means of electronic transmission, if approved in advance by USEPA) has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: (b) (4)Name: (b) (4)(b) (4) 0000000001Date: 10. 7. 08Title: (b) (4)

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057	Case #: 37814	SDG #: MC02M1
----------------------	---------------	---------------

SDG NARRATIVE

SAMPLE RECIEPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

ICP-AES
HG-Mercury

No discrepancies or issues were noted during receipt and login.

MERCURY

Soil samples were digested by Hot-Block technique (CS1) and analyzed using a Perkin Elmer FIMS-100 Mercury Analyzer.

MS and DUP were performed on sample "MC02M1" and they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed after holding times.

ICP-AES

Soil Samples were digested by Hot-Block technique (HS2) and analyzed using a Thermo Electron ICAP6500.

MS and DUP were performed on sample "MC02M1" and they were within the QC limits.

Serial Dilution was performed on sample "MC02M1" they were within the QC limits.

No problems were encountered during sample preparation or analysis.

All samples were prepared and analyzed after the holding times.

2 10/1/08

A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

Contract #: EPW06057

Case #: 37814

SDG #: MC02M1

SDG NARRATIVE

The following equations are used for calculation of sample results from raw instrument output data:

MERCURY

SOIL Samples:

$$\text{Hg Concentration (mg/kg)} = \text{Hg } \mu\text{g/g} = \frac{C}{W * S} * (0.1l)$$

Where,

C = Concentration from curve ($\mu\text{g/L}$)

W = Wet sample weight (g) (0.2gm)

S = % solids/100

ICP-AES

SOIL Samples:

$$\text{Concentration (dry Wt.) (mg/kg)} = \frac{C * V}{W * S} * DF$$

Where,

C = Concentration (mg/L)

V = Final sample volume in Liters (L) (0.1L)

W = Wet sample weight (kg) (0.001kg)

S = % solids/100

DF = Dilution Factor

3 2/10/17/08

Percent Solids Logbook

Effective	Area	Type	Number-Version	RCN
28-NOV-07	WET CHEM	FORM	5FORM03	737-0721

DATE IN: 09/30/08 TIME IN: 11:20 TEMP IN: 104°CDATE OUT (1): 10/01/08 TIME OUT (1): 9:50 TEMP OUT (1): 104°CDATE OUT (2): - TIME OUT (2): - TEMP OUT (2): -DATE OUT (3): - TIME OUT (3): - TEMP OUT (3): -SOP: 550103 - A Method: ASTMD2216-92/SM2540G/ILM05.3/SOM1.1; other.Oven ID: A Thermometer ID: SER 2

Pan #A	Lab Sample ID B	Client Sample ID C	Pan Weight (g) D	Pan + Wet Sample (g) E	Pan + Dry Sample #1 (g) F	Pan + Dry Sample #2 (g) F	Pan + Dry Sample #3 (g) F	Percent solids ** I
18	8100003-BK	PMBLK 74	1.818	-	1.814	NA	NA	-
37	0009543-01	MC02M1	1.804	11.679	10.357	↓	↓	86.6
45	↓ -02	MC02M3	1.791	11.507	9.403	↓	↓	78.3
21	↓ -01D	MC02M1	1.774	11.681	10.361	↓	↓	86.6

Notes: _____

Analyst/Date: (b) (4) 10/21/08 Reviewer/Date: (b) (4) 10/03/08

Final Dry Weight (F) is used when monitored final weights are consistent.

**Percent solids(G) = {(F-D)/(E-D)}*100

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