

March 3, 2010

Ms. Christine Wagner (3HS32) On-Scene Coordinator 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 (μg/L) to 50 μg/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 ( $\mu$ g/L) to 26.6  $\mu$ 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  $50 \,\mu\text{g/L}$ .
- Appnedix 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,

Erik Armistead

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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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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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START Back-up Point of

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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	1 3 gallons 1		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	pН	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:

 $\mu$ S/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	pН	Oxidation- Reduction Potential	Turbidity
SW01	NR	313 μS/cm	2.79 mg/L	4.35	356	11.5 NTU
SW02	NR	431 μS/cm	2.20 mg/L	4.26	399.8	89 NTU
SW02S	NR	431 μS/cm	2.20 mg/L	4.26	399.8	89 NTU

Notes:

 $\mu$ S/cm = Microsiemens per centimeter

mg/L = Milligrams per liter

NTU = Nephelometric turbidity unit

°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	<u> </u>		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	Laboratory	Sample	Collection	Sample Laboratory Sample Collection								
<b>Identifier</b>	Identifier	Date	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) (b)	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) (b)	8/26/2008	1026	TAL metals, boron, molybdenum								
(b) (6)	(b) (6)	8/26/2008	1050	TAL metals, boron, molybdenum								
(b) (b)(b) (b)	(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								
(n) (n)(n) (n)	(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)(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								

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TABLE 5
POTABLE WATER SAMPLING SUMMARY

Sample Identifier	Laboratory <u>Identifier</u>	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

TAL = Target analyte list

PW = Potable water sample

# 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 (µg/L). Three of the four samples were elevated slightly over the action level, ranging from 17.9 to 18.9 μg/L. One of the four samples was greater than four times the action level, at 67.1 µg/L. No other residential potable well samples exceeded the MCLs for any detected analyte. Three residential potable water samples (duplicate sample), and (b) (6) (b) (6)(b) (6)(b) (6)(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 μg/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 µg/L for total arsenic. Those

three samples ranged in concentrations of total arsenic from 10.7 to 19.8  $\mu$ g/L. One of the three samples also exceeded the MCL for dissolved arsenic (10  $\mu$ g/L), with a concentration of 21.0  $\mu$ g/L. Analytical results from samples collected from seven of the 13 groundwater sampling locations exceeded the action level for total lead (15  $\mu$ g/L). Those seven samples ranged in concentrations of total lead from 15.6 to 28.3  $\mu$ g/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  $\mu$ g/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 downgraident of the Battlefield Golf Club.

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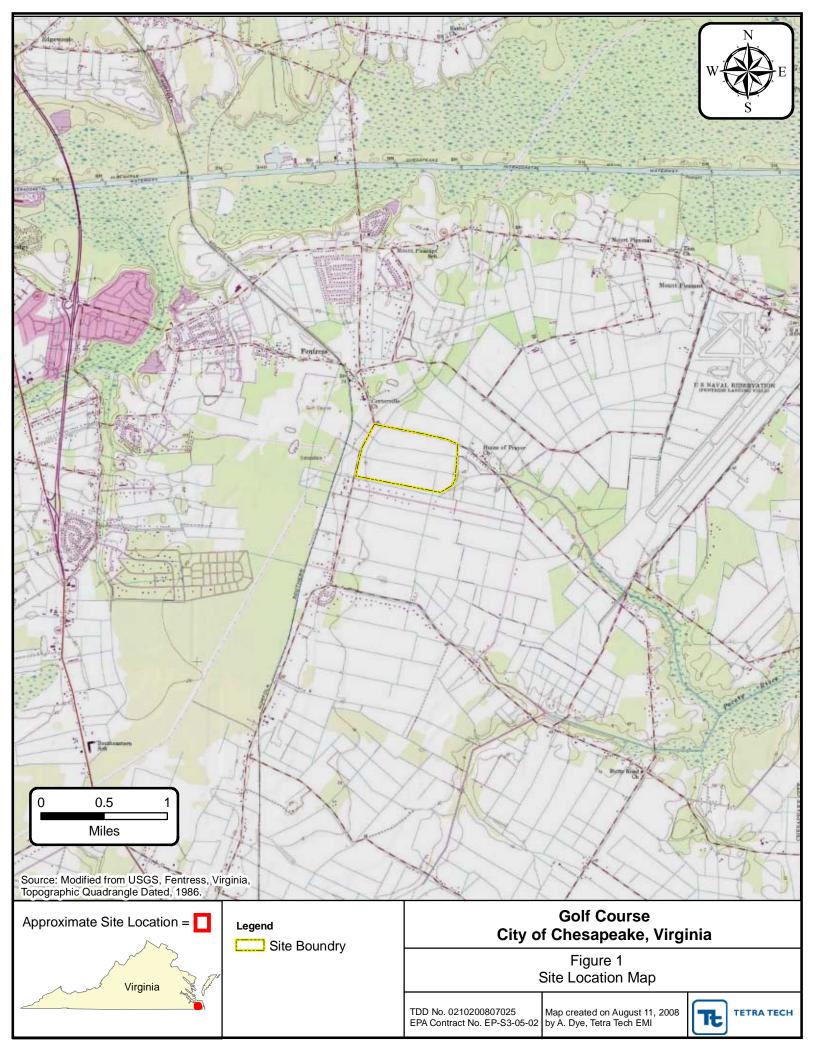
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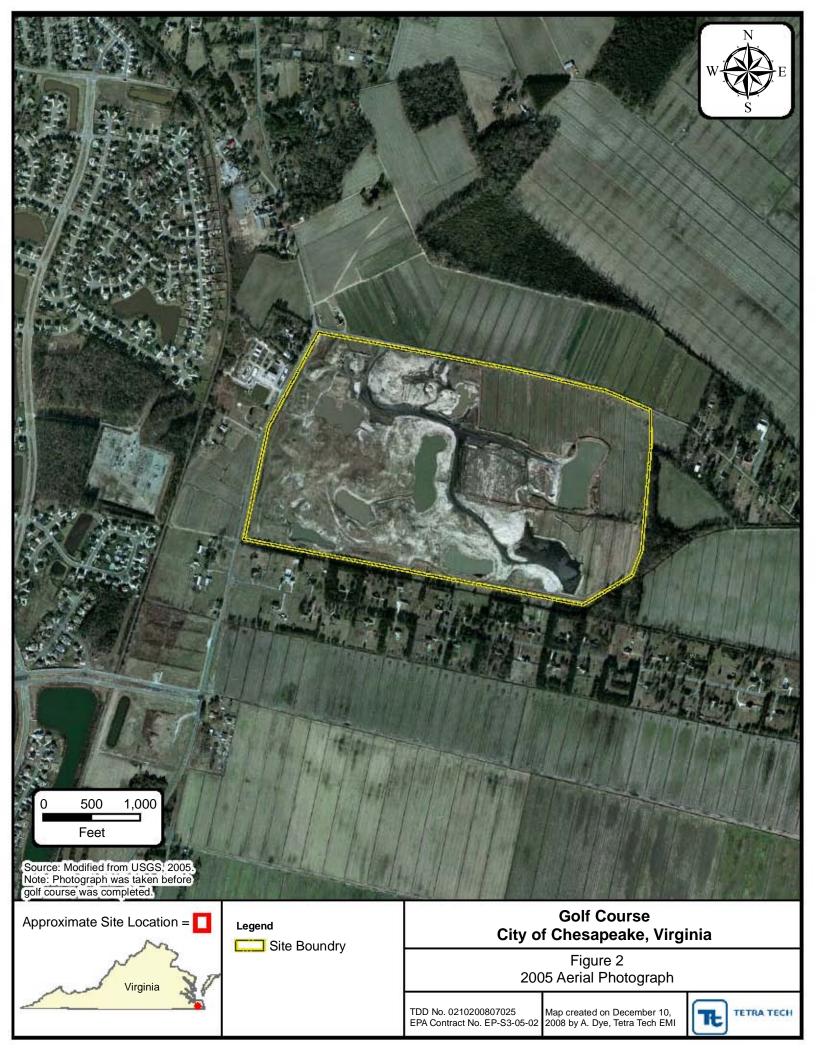
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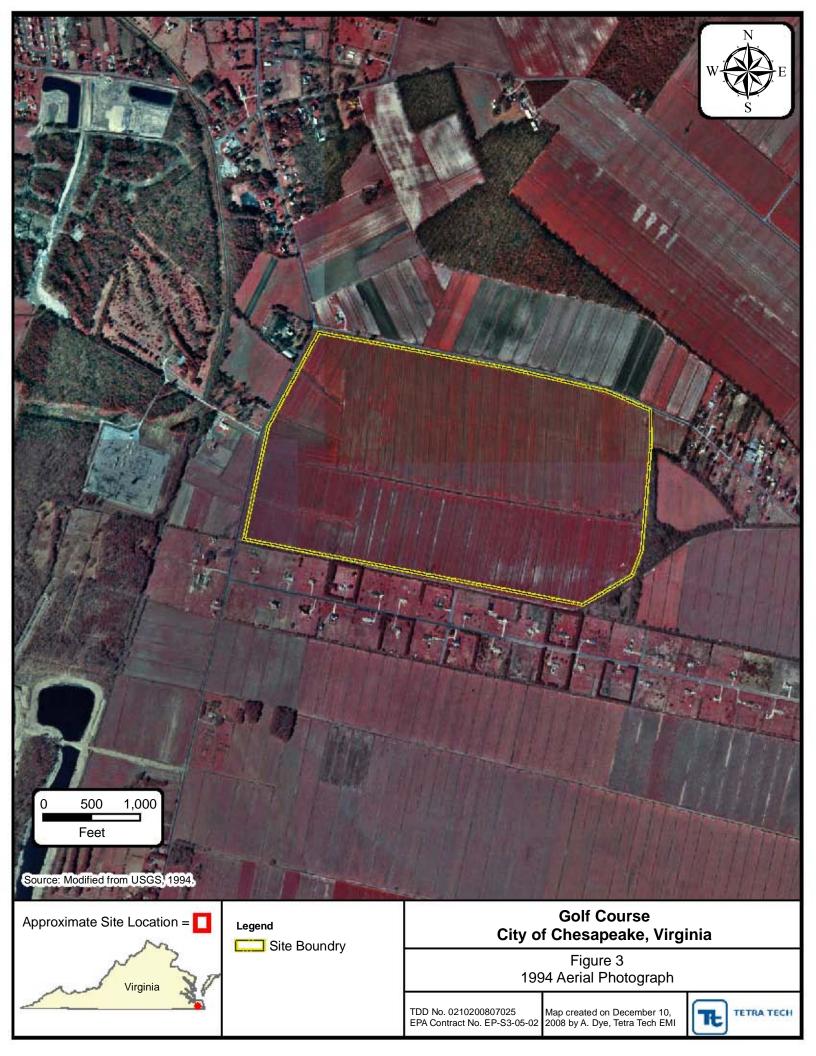
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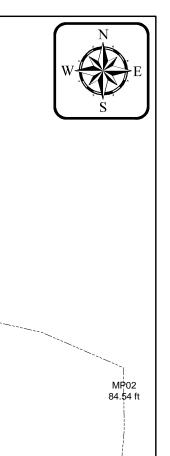
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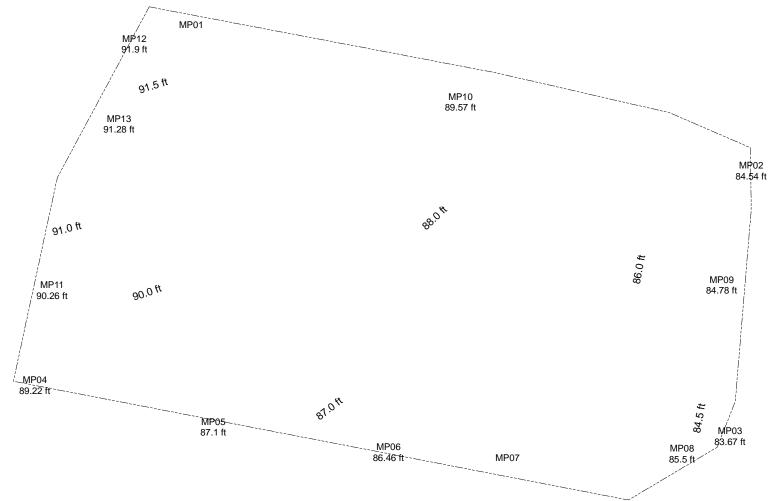
APPENDIX A
FIGURES

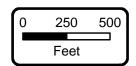




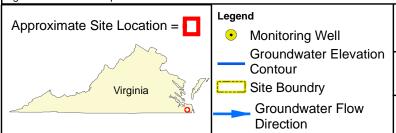








Source: Modified from USGS, 2005. Note: Photograph was taken before golf course was completed. Note: Groundwater elevation based on a relative benchmark and are not based on actual sea-leve!



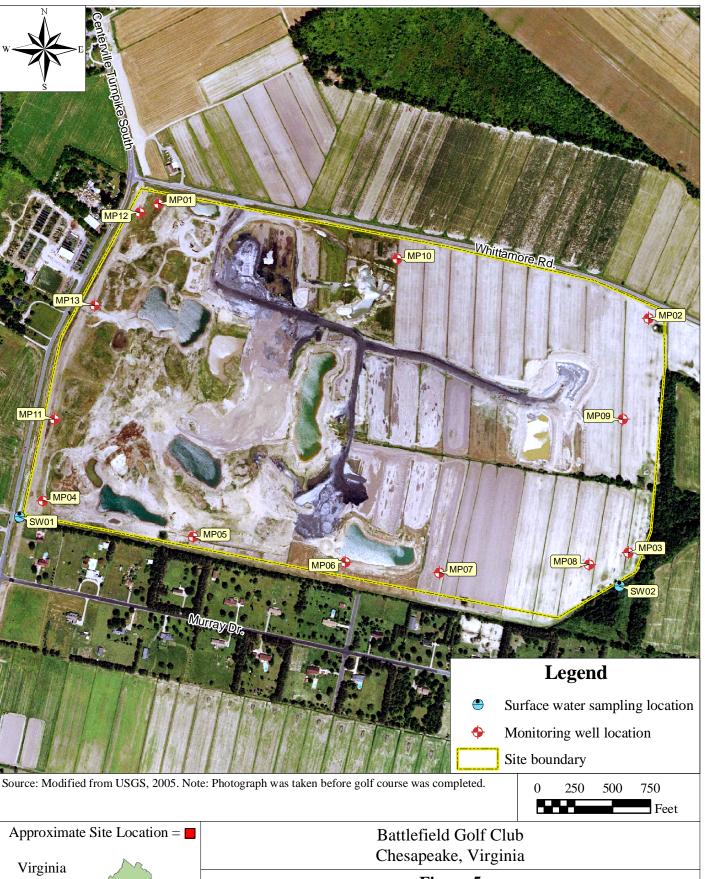
# Golf Course City of Chesapeake, Virginia

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







# Figure 5 Surface Water Sampling Location Map

TDD No. E33-020-08-07-027 EPA Contract No. EP-S3-05-02 Map created on December 11, 2008 by D. Call, Tetra Tech EM Inc.



APPENDIX B

**BORING LOG** 

	Project No.	103X9021020FP.0807027	Page	1 of 13
7 Creek Parkway, Suite 700	Boring No.	MP01	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Douthwyn, i ennsylvania 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complet		7		

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.
				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'
				Poorly Graded Silty Sand	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				Poorly Graded Silty Sand	Boring terminated at 12.0'. Slight boring collapse, and MP01 set at 11 0'.  NA = Not applicable

	Project No.	103X9021020FP.0807027	Page	2 of 13
7 Creek Parkway, Suite 700	Boring No.	MP02	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Boothwyn, i ennsylvania 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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 dian	neter monitoring point.		6.5

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 5' SM - dark brown silty sand  2 5' - 4.0' SM - light to medium brown silty sand
				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		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'
				Poorly Graded Silty Sand	6 0' - 11.0' - 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	Boring terminated at 12.0'. Slight boring collapse, and MP02 set at 11.0'.
12					

	Project No.	103X9021020FP.0807027	Page	3 of 13
7 Creek Parkway, Suite 700	Boring No.	MP03	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Boothwyn, Fernisylvanna 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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	neter 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 0' above surface. 0' - 3 0' SM - light brown silty sand 3 0' - 4.0' SM - light to medium brown silty sand
				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 - light to medium brown silty sand
				Poorly Graded Silty Sand	6 0' - 8.0' SP - gray poorly graded silty sand, wet at 6.0' 7 0' - 12.0' - 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'. MP03 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	4 of 13
7 Creek Parkway, Suite 700	Boring No.	MP04	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Booliwyii, Fernisyivanna 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complete		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
				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
				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				Poorly Graded Silty Sand	Boring terminated at 12.0'. MP04 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	5 of 13
7 Creek Parkway, Suite 700	Boring No.	MP05	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Dodawyn, r ennsylvanna 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complete	neter monitoring point.		5.5	

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
				***************************************	Monitoring point casing stick-up to 1 5' above surface.
0	0'-4'	48/48	NA		0' - 4 0' SM - medium to dark brown silty sandl
				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
				Poorly Graded 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	Poorly Graded Silty Sand	8.0' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP05 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	6 of 13
7 Creek Parkway, Suite 700	Boring No.	MP06	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Boothlyn, Felmsylvania 19901			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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		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
				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
				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				Poorly Graded Silty Sand	Boring terminated at 12.0'. MP06 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	7 of 13
7 Creek Parkway, Suite 700	Boring No.	MP07	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Bootinyii, i eiiiisyivainia 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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		6.5		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
				30000 100000000000000000000000000000000	Monitoring point casing stick-up to 1 5' above surface.
0	0'-4'	48/48	NA		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	Poorly Graded Silty Sand	8.0' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP07 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	8 of 13
7 Creek Parkway, Suite 700	Boring No.	MP08	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Dodawyi, i emisyivama 13001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complete	d as 1-inch dian	neter 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 2 0' above surface. 0' - 4 0' SM - light 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' - 7.0' SM - light brown to red brown silty sand
					7 0' - 8.0' SM - light brown to gray silty sand, moist
				Silty Sand	
				Salu	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				Poorly Graded Silty Sand	Boring terminated at 12.0'. MP08 set at 12 0'.
12					

	Project No.	103X9021020FP.0807027	Page	9 of 13
7 Creek Parkway, Suite 700	Boring No.	MP09	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Boothwyn, i ennsylvanna 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complete		6.5		

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 - light to medium brown silty sand
				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
				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	Poorly Graded Silty Sand	8.0' - 12.0' SP - gray poorly graded silty sand, saturated
12					Boring terminated at 12.0'. MP09 set at 12 0'.

			1_	
	Project No.	103X9021020FP.0807027	Page	10 of 13
7 Creek Parkway, Suite 700	Boring No.	MP10	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Bootiwyii, Perinsyivanna 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complete		4.5		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
				200001 11111111111111111111111111111111	Monitoring point casing stick-up to 2 0' above surface.
0	0'-4'	48/48	NA		0' - 4 0' SM - medium to dark brown silty sand, some gravel
				Silty Sand	0' - 1.5' - bentonite pellets in annulus
					15'-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
				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
12				Poorly Graded Silty Sand	Boring terminated at 12.0'. MP10 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	11 of 13
7 Creek Parkway, Suite 700	Boring No.	MP11	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Boothwitt, Fellinsylvanna 19001			Drilling Method:	Direct-push
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complete		5		

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
				200000	Monitoring point casing stick-up to 2 0' above surface.
0	0'-4'	48/48	NA		0' - 4 0' SM - medium to dark brown silty sand, trace gravel
				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' - 5.0' SM - medium brown silty sand
					5 0' - 8.0' SM - medium brown silty sand, moist at 5.0'
				Silty Sand	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
				Poorly Graded Silty Sand	
12					Boring terminated at 12.0'. MP11 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	12 of 13
7 Creek Parkway, Suite 700	Boring No.	MP12	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Bootiwii, Felinsylvania 19001			Drilling Method:	Direct-push
Project Location: Battlefield Golf Club at Centerville 1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complete	d as 1-inch dian	meter monitoring point.		5

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
				30006 000000000000000000000000000000000	Monitoring point casing stick-up to 2 0' above surface.
0	0'-4'	48/48	NA		0' - 4 0' SM - medium to dark brown silty sand, trace gravel
				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' - 5.0' SM - medium brown silty sand
					5 0' - 8.0' SM - light brown to gray silty sand, moist at 5.0'
				Silty Sand	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				Poorly Graded Silty Sand	Boring terminated at 12.0'. MP12 set at 12 0'.

	Project No.	103X9021020FP.0807027	Page	13 of 13
7 Creek Parkway, Suite 700	Boring No.	MP13	Drilling Rig:	Geoprobe
Boothwyn, Pennsylvainia 19061	Contractor:	Davidson Drilling, Inc.		
Doditwyn, i erinsylvania 19001			Drilling Method:	Direct-push
Project Location:  Battlefield Golf Club at Centerville  1001 Centerville Turnpike	Drill Crew:	(b) (4)	Sampling Method:	Continuous soil sampling, 4' acetate sleeves
Chesapeake, VA 23322	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: Complet	ed as 1-inch dian	neter monitoring point.		5.5

DEPTH (feet)	SOIL SAMPLE INTERVAL (feet)	Recovery	PID (ppm)	LITHOLOGY	SAMPLE DESCRIPTION
				30000 naaaaaaaaaa 20000	Monitoring point casing stick-up to 2 0' above surface.
0	0'-4'	48/48	NA		0' - 4 0' SM - medium to dark brown silty sand, trace gravel
				Silty Sand	0' - 2.5' - bentonite pellets in annulus
					25'-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'
				Silty Sand	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
				Poorly Graded Silty Sand	
12					Boring terminated at 12.0'. MP13 set at 12 0'.

# APPENDIX C DATA SUMMARY TABLES



# TABLE 1 ANALYTICAL RESULTS SURFACE WATER SAMPLES

		TOTAL		TOTAL		TOTAL		DISSOLVE	)	DISSOLVE	)	DISSOL	/ED
Sample Number Sampling Location Date Sampled : Time Sampled : Units:		MC02B8 BG08-SW-SW01 8/29/2008 12:51 μg/L		MC02B9 BG08-SW-SW02 8/29/2008 15:40 μg/L		MC02L5 BG08-SW-SW02S 8/29/2008 15:40 μg/L		MC1GG8 BG08-SW-SW01 8/29/2008 12:51 µg/L		MC1GG9 BG08-SW-SW02 8/29/2008 15:40 μg/L		MC1GH13 BG08-SW-SW0 8/29/2008 15:40 µg/L	)2S
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM ANTIMONY ARSENIC BARIUM BERYLLIUM	200 60 10 200 5	403 30.0 0.59	J	630 37.9 0.55	J	622		319 5.9 33.3 0.52	J	478 40.6 0.50	J	531	
CADMIUM  CALCIUM  CHROMIUM  COBALT  COPPER	5 5000 10 50 25	19300 5.6	J	24900 9.2	J	25900		18400 4.8	J	23300 8.2	J	24600	
IRON LEAD MAGNESIUM MANGANESE	100 10 5000 15	996 4.8 7250 360	J	1140 1.4 8530 358	B J	422 8940 378		665 6520 346	В	254 7510 339	В	265 8590 363	
MERCURY NICKEL POTASSIUM SELENIUM	0.2 40 5000 35	3.6 2620	J J	4.9 4680	J	15.2 4990	J J	11.3 2700	J	13.1 4610	J	14.6 4740	J
SILVER SODIUM THALLIUM VANADIUM	10 5000 25 50	14600		23400	UL	25900		15700		24400		24700	
ZINC MOLYBDENUM BORON	60 5 50	24.7 25.6	J	26.0 22.1	J UL J	28.0 39.9	J	22.1 34.8	J B	22.8 30.9	J B	27.4 38.2	J

Notes:

μg/L = Micrograms per liter

CRQL = contract required quantitation limit



### Table 2 ANALYTICAL RESULTS SUBSURFACE SOIL SAMPLES

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											
ANALYTE	CRQL	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	В	1.1	В	2.0	J	0.98	В	3.3	J	1.1	В		

Notes:

mg/kg = millligrams per kilogram

CRQL = contract required quantitation limit



### Table 2 ANALYTICAL RESULTS SUBSURFACE SOIL SAMPLES

Sample Number :		MC02K3		MC02K4		MC02K5		MC02K6		MC02K7		MC02K8		MC02M3		MC02K9	
Sampling Location :		BG08-SS-MP07		BG08-SS-MP08	3	BG08-SS-MP09		BG08-SS-MP10		BG08-SS-MP11		BG08-SS-MP12		BG08-SS-MP	12S	BG08-SS-MP1	3
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											
ANALYTE	CRQL	Result	Flag		Flag		Flag		Flag	Result	Flag		Flag		Flag		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		0.28	J						
BORON	5	2.3	В			5.1	В	5.6	J	1.0	В	1.0	В			1.7	В

Notes:

mg/kg = millligrams per kilogram

CRQL = contract required quantitation limit



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

Notes:

 $\mu$ g/L = Micrograms per liter

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= Shaded cell indicates compound reported above MCL



Sample Number : Sampling Location :			(b) (6) (b) (6)(b) (	(6)	(b) (6) (b) (6)		(b) (6) (b) (6)(b)	(6)	(b) (6) (b) (6)											
Date Sampled :			8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	Į.
Time Sampled :			11:31		13:28		13:36		14:16		15:15		16:23		19:19		19:19		20:15	ı
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		Flag	Result	Flag	Result	Flag								
ALUMINUM	200	NS	20.7	J			23.7	J	93.6	J										
ANTIMONY	2	6									0.20	В								
ARSENIC	1	10	1.2	В	1.4		1.3	В	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	В	0.12	В						
CALCIUM	5000	NS	15600		39500		41700		71600		73900		42600		225000		223000		50700	
CHROMIUM	2	NS	1.1	J	0.63	В	0.65	В	1.0	J	0.59	В	0.62	В	0.91	J	0.61	В	0.56	В
COBALT	1	NS									0.13	В								
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	В	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										
SILVER	1	NS				UL		UL		UL	0.087	В	0.040	В		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	В	0.59	В	0.37	В	0.81	В	0.80	В	0.61	В	0.69	В	0.70	В
ZINC	2	NS	29.1		6.6		8.8		3090		8.3		10.2		4.0		3.9		60.2	
MOLYBDENUM BORON	5 50	NS NS	29.1	В	107		124		54.9		94.4		16.9	В	29.8	В	30.8	J	18.4	В

Notes:

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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	В	0.99	В
ARSENIC	1	10	1.1		1.4		1.4		1.4		1.5		1.3		1.4	В	1.3	В
BARIUM	10	2000	17.3		2.6	В	4.5	В	4.7	В	21.4		1.8	J	1.7	В	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	В	0.45	В	0.61	В	0.49	В	0.49	В	0.81	J	1.4	J
COBALT	1	NS													0.20	В	0.21	В
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	В	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	В	0.37	В	0.49	В	1.2		0.34	J	0.74	В	1.2	
POTASSIUM	5000	NS	3260	J	20600		2660	J	19600		4300	J	8710		9000		1410	J
SELENIUM	5	50			1.9	J		UL										
SILVER	1	NS		UL		UL		UL		UL		UL		UL	0.063	В	0.083	В
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	В	0.80	В	0.49	В	1.0	В	0.78	В	1.2	В	1.1	В
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	В	284		44.2	J	115		146		19.7	J

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Sample Number :			(b) (6)		(b) (6)	(0)	(b) (6)		(b) (6)		(b) (6)		(b) (6)	(0)	(b) (6)	(0)	(b) (6)	(0)
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	В				
ARSENIC	1	10	1.4		1.6		1.5	В	1.7		1.4	В	1.3	В	1.3	В	1.4	В
BARIUM	10	2000	1.5	J	1.3	В	10.2		1.8	В	1.2	В	1.6	В	1.6	В	1.8	В
BERYLLIUM	1	4																
CADMIUM	1	5											0.11	В	0.15	В	0.11	В
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	В	0.74	В	0.76	В	0.76	В
COBALT	1	NS	0.14	J	0.11	В			0.17	В			0.13	В				
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	В	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	В	1.3		0.63	J	0.65	В	0.45	В	0.51	В
POTASSIUM	5000	NS	9320		9270		1310	J	13600	l	3250	J	3190	В	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	В
SODIUM	5000	NS	75800	J	75900	J	9370	J	157000	J	30600	J	30600	J	59700	J	48300	J
THALLIUM	1	2	4.0		4.0	_	0.00	_	4.5		0.00		4.0	_	0.74	_	0.70	_
VANADIUM	5	NS	1.0	J	1.3	В	0.88	В	1.5	J	0.69	В	1.2	В	0.71	В	0.78	В
ZINC	2	NS	12.0		54.1		7.2		41.4		10.1		8.7		2.2		9.0	
MOLYBDENUM	5 50	NS NS	144		146		26.4	١.	207		51.4		56.7		131		122	
R∩R∩N	30	NO	144		140		20.4	J	207		51.4		50.7		131		122	

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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)	<b>(</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	
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	
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		
ANTIMONY	2	6													0.23	В		
ARSENIC	1	10	1.9		1.6		1.5	В	1.5		1.5	В	1.6		1.5		1.6	
BARIUM	10	2000	4.0	В	29.4		6.7	J	5.6	В	5.4	В	44.1		22.2		14.2	
BERYLLIUM	1	4																
CADMIUM	1	5									0.12	В	0.13	В	0.16	В	0.10	В
CALCIUM	5000	NS	37100		47100		52800		52300		48900		160000		118000		142000	
CHROMIUM	2	NS	0.96	J	0.88	В	0.83	В	0.87	В	0.79	В	1.5	J	0.99	J	1.1	J
COBALT	1	NS			0.11	В												
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	В	0.20	В	7.1		4.6		12.0		7.4		7.7		8.7	
MAGNESIUM	5000	NS	45300		34600		2720	J	2700	В	2430	J	14900		8650		8130	
MANGANESE	1	NS	5.0		200		44.6		47.2		46.6		484		127		154	
MERCURY	0.2	2																
NICKEL	1	NS	0.47	В	0.55	В	1.5		1.1		0.85	В	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	В	0.063	В
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	В	0.86	В	0.60	J	1.6	J	0.95	В	1.7	J	1.1	В	1.0	В
ZINC	2	NS	3.4		3.5		82.0		44.7		14.4		375		101		223	l l
MOLYBDENUM	5	NS	500		444		440		40.0		40.0	UL	400	UL	00.0	UL	04.0	UL
RORON	50	NS	539		114		14.0	J	18.3	J	18.3	J	160		26.6	J	24.6	J

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Sample Number :			(b) (6)		(b) (6)		(b) (6)		(b) (6)	(0)	(b) (6)		(b) (6)		(b) (6)		(b) (6)	(0)
Sampling Location :			(b) (6)		(b) (6)		(b) (6)		(b) (6)(b) (	<b>(6)</b>	(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	В	1.4	В	1.1	В			0.22	В		
ARSENIC	1	10	1.4	В	1.7		1.7		1.4		1.8		1.6		1.7		1.5	
BARIUM	10	2000	3.0	В	1.9	В	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	В		
CALCIUM	5000	NS	64800		73800		135000		143000		146000		49500		82000		65200	
CHROMIUM	2	NS	0.93	J	0.83	В	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	В	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	В	2.4				2.6		0.80	J	1.7		0.68	J
POTASSIUM	5000	NS	1600	J	3010	J	636	J			2480	J	2810	J	1490	J	2910	J
SELENIUM	5	50		UL		UL												
SILVER	1	NS		UL		UL	0.037	В		UL	0.083	В		UL	0.097	В	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	В						
VANADIUM	5	NS	1.2	В	1.7	J	1.0	В			1.1	В	1.3	В	1.2	В	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	45.7	UL		UL	00.4	UL	00.4	UL	0.5.4	UL	40.0		44.7		40.5	
RORON	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

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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)													
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	В					0.26	J			0.10	В				
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	В	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	В						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	В	1.1	В	0.63	В	1.2	В	1.3	J	1.1	В	0.90	J	0.69	В
ZINC	2	NS	42.3		3.4		7.3		71.5		3.3		66.5		11.6		28.1	
MOLYBDENUM	5	NS														UL		
RORON	50	NS		UL	31.5	J	150		41.6	J	12.4	J	18.9	J	14.5	J	108	J

Notes:

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= Shaded cell indicates compound reported above MCL



Sample Number :			(b) (6)	(0)	(b) (6)		(b) (6)		(b) (6)		(b) (6)	(0)	(b) (6)		(b) (6)		(b) (6)	
Sampling Location:			(3) (3)(3)	(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		Flag		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	В	0.16	В								
CALCIUM	5000	NS	26900		30200		89300				18700		66300		1600	J	96100	
CHROMIUM	2	NS			0.65	J	0.52	В	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	В	0.043	В		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	В	2.4	J			0.76	В	0.75	В	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	Κ	145	J				UL	33.6	J	32.3	J		UL	321	

Notes:

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Sample Number			(b) (6)		(b) (6)		(b) (6)	<b>/</b> >	(b) (6)	<b>(-)</b>	(b) (6)		(b) (6)	
Sampling Locatio			(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		8/28/2008	
Time Sampled :			10:23		10:29		11:19		11:19		11:30		11:13	
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												
ANTIMONY	2	6			0.44	В	1.2	J	0.23	В	0.22	В		
ARSENIC	1	10	1.6		1.6		1.4		1.6		1.5		1.4	В
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	В	0.82	J	0.74	В	0.90	J	1.9	J
COBALT	1	NS					0.14	В					0.14	В
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	В	0.067	В	0.050	В	0.047	В	0.040	В
SODIUM	5000	NS	44300	J	42200	J	51100	J	52800	J	113000	J	64700	J
THALLIUM	1	2					0.11	В						
VANADIUM	5	NS	1.2	J	1.4	J	0.64	В	0.99	В	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:

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= Shaded cell indicates compound reported above MCL



### TABLE 4 ANALYTICAL RESULTS ON SITE GROUNDWATER SAMPLES - TOTAL METALS

Sample Number : Sampling Location : Date Sampled : Time Sampled : Units:			MC02A1 BG08-GW-MP01 8/28/2008 12:40 μg/L		MC02A2 BG08-GW-MP02 8/29/2008 11:15 µg/L		MC02A3 BG08-GW-MP03 8/29/2008 10:00 μg/L		MC02L2 BG08-GW-MP038 8/29/2008 10:00 μg/L	S	MC02A4 BG08-GW-MP0 8/28/2008 14:06 µg/L	4	MC02A5 BG08-GW-MP0 8/28/2008 15:50 µg/L	5	MC02A6 BG08-GW-MP00 8/28/2008 17:47 μg/L	6	MC02A7 BG08-GW-MP0 8/28/2008 18:10 μg/L	
ANALYTE	CRQL	MCL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM ANTIMONY ARSENIC BARIUM BERYLLIUM	200 60 10 200 5	NS 6 10 2000 4	100 34.9	J	1460 10.7 48.1	J	202 22.9	J	957		177 2.6 79.4	J	1060 4.6 83.4	J	1030 3.5 85.7	J	423 19 8 33.7	J
CADMIUM CALCIUM CHROMIUM COBALT COPPER	5 5000 10 50 25	5 NS NS NS 1300	27500 1.1	J	32300 11.1 12.1 2.4	J	65700 3.5 5.2	J J	63500 5.3	J	20000 2.1	J	41000 4.3	J	59300 8.9	J	62900 3.3 47 2	J
IRON LEAD MAGNESIUM MANGANESE MERCURY	100 10 5000 15 0.2 40	NS 15 NS NS 2 NS	8060 1.7 5750 149	J	13100 11.8 12300 204 0.073 10.2	J	11700 8.9 34600 135	J	12800 34200 151		9590 2.8 3720 160	J	12900 6.1 9190 272	J	16300 17.3 37500 224		38400 28 3 17100 348 61 0	1
NICKEL POTASSIUM SELENIUM SILVER SODIUM	5000 35 10 5000	NS 50 NS NS	5770 18600		2430	J	4880 21600	J	5220 22400		4440 8950	J	6180 12300		3210 26900	J	1710 8080	J
THALLIUM VANADIUM ZINC MOLYBDENUM BORON	25 50 60 5 50	2 NS NS NS NS	6.2 15.2	B UL J	4 0 60.6 5.6	J UL J	9.8 9.9	B UL J	25.1	UL J	12.8 7.4	J UL J	6.4 14.9	B UL J	14.3	J UL	326 22.7	UL J

Notes:

 $\mu$ g/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



### TABLE 4 ANALYTICAL RESULTS ON SITE GROUNDWATER SAMPLES - TOTAL METALS

Sample Number :			MC02A8		MC02L3		MC02A9		MC02B0		MC02B1		MC02B2		MC02B3		MC02B4	
Sampling Location:			BG08-GW-MP08	3	BG08-GW-MP08	S	BG08-GW-MP09		BG08-GW-MP10		BG08-GW-MP11		BG08-GW-MP12		BG08-GW-MP13		BG08-GW-MW0	1
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	1_	μg/L		μg/L	_	μg/L	1	μg/L	-	μg/L	-	μg/L 		μg/L	T
ANALYTE	CRQL	MCL	Result	Flag		Flag		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	В	4.2	В	7.1	В	70 8	
MOLYBDENUM	5	NS		UL		UL		UL	9.7			UL		UL		UL		UL
RORON	50	NS	39.1	J	54.1	Κ	13.6	J			19.0	J	52.5		24.7	J		

Notes:

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### TABLE 4 ANALYTICAL RESULTS ON SITE GROUNDWATER SAMPLES - TOTAL METALS

Sample Number :			MC02B5		MC02B6		MC02B7		MC02L4	
Sampling Location:			BG08-GW-MW02		BG08-GW-MW02	:D	BG08-GW-MW03	3	BG08-GW-MW03	ss
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		Flag		Flag		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	В	6.5	В	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:

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### TABLE 5 ANALYTICAL RESULTS ON SITE GROUNDWATER SAMPLES DISSOLVED METALS

Sample Number :			MC1GF1		MC1GF2		MC1GF3		MC1GH0 BG08-GW-MP03		MC1GF4		MC1GF5		MC1GF6	
Sampling Location :			BG08-GW-MP01 8/28/2008		BG08-GW-MP02 8/29/2008		BG08-GW-MP03 8/29/2008		8/29/2008	5	BG08-GW-MP04 8/28/2008		BG08-GW-MP05 8/28/2008		BG08-GW-MP06 8/28/2008	3
Date Sampled :			12:40		11:15		10:00		10:00		14:06		15:50		17:47	
Time Sampled : Units:			μg/L		μg/L		μg/L		μg/L		μg/L		μg/L		μg/L	
ANALYTE	CRQL	MCL	Result	Flag		Flag	Result	Flag		Flag		Flag		Flag		Flag
ALUMINUM	200	NS		В		Ŭ		Ť		J	23.6	J		Ŭ		Ť
ANTIMONY	2	6	0.43	В	1.2	В	0.25	В			0.23	В	0.21	В	0.20	В
ARSENIC	1	10	1.3		6.6		2.5		1.2	К	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	В	0.13	J					0.20	J	0.19	J
CADMIUM	1	5	0.11	В	0.13	В							0.18	В		
CALCIUM	5000	NS	27800		30400		64000		65800		20700		42600		61200	
CHROMIUM	2	NS	0.73	В	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	В	1.1	
COPPER	2	1300	0.69	J	0.55	В	0.39	В			0.37	В	0.43	В	0.39	В
IRON	100	NS	7430		7460		7440		6920		9790		11700		15700	
LEAD	1	15	0.26	В	0.26	В	0.25	В			0.12	В	0.16	В	0.20	В
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	В	0.070	В		UL				UL	0.067	В	0.053	В
SODIUM	5000	NS	19500		12100		21900		23200		9660		13400		28200	
THALLIUM	1	2	0.17	В	0.15	В										
VANADIUM	5	NS	0.69	В	1.4	J	1.0	В			0.67	В	0.90	В	1.6	J
ZINC	2	NS	10.5		55.7		5.4		1.5	J	16.1		6.3		8.2	
MOLYBDENUM BORON	5 50	NS NS	1.8 27.0	J J	17.9	J	20.8	J	25.3	J	19.8	J	26.1	J	16.0	J

#### Notes:

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## TABLE 5 ANALYTICAL RESULTS ON SITE GROUNDWATER SAMPLES DISSOLVED METALS

Sample Number :			MC1GF7		MC1GF8		MC1GH1		MC1GF9		MC1GG0		MC1GG1		MC1GG2	
Sampling Location :			BG08-GW-MP07		BG08-GW-MP08		BG08-GW-MP08	S	BG08-GW-MP09		BG08-GW-MP10		BG08-GW-MP11		BG08-GW-MP12	2
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:	0001		μg/L	I	μg/L		μg/L	T =:								
ANALYTE	CRQL	MCL	Result	Flag		Flag	Result	Flag		Flag	Result	Flag		Flag	Result	Flag
ALUMINUM	200	NS	48.3	J	73.5	J			95.3	J			84.1	J		
ANTIMONY	2	6	0.21	В												
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	В
BERYLLIUM	1	4	0.58	В	0.27	J			0.40	J	0.18	J	0.20	J		
CADMIUM	1	5			0.13	В										
CALCIUM	5000	NS	66700		49200		47600		22000		39100		19900		36200	
CHROMIUM	2	NS	1.8	J	1.0	В			1.4	J	1.4	J	2.1		0.68	В
COBALT	1	NS	50.4		12.1		10.2	Κ	24.3		2.9		0.48	В	1.6	
COPPER	2	1300	0.34	В	0.62	J			0.35	В	0.40	В	0.30	В	0.55	В
IRON	100	NS	39300		12700		12400		8500		6190		13100		5490	
LEAD	1	15	0.12	В	0.15	В			0.10	В	0.10	В				
MAGNESIUM	5000	NS	18200		13800		13600		18500		11900		4130	J	5700	
MANGANESE	1	NS	334		134		111	Κ	121		102		126		206	
MERCURY	0.2	2														
NICKEL	1	NS	69.5		17.5		12.8	Κ	35.4		5.4		0.66	В	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	В		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	В
ZINC	2	NS	330		103		91.8	К	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:

 $\mu$ g/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



### TABLE 5 ANALYTICAL RESULTS ON SITE GROUNDWATER SAMPLES DISSOLVED METALS

Sample Number :			MC1GG3		MC1GG4		MC1GG5		MC1GG6		MC1GG7		MC1GH2	
Sampling Location:			BG08-GW-MP13	3	BG08-GW-MW01	l	BG08-GW-MW02	2	BG08-GW-MW02	2D	BG08-GW-MW03	3	BG08-GW-MW03	3S
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	T	μg/L		μg/L	·	μg/L	-	μg/L	r	μg/L	
ANALYTE	CRQL	MCL	Result	Flag		Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	NS			28.8	J								
ANTIMONY	2	6					0.23	В						
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	В	1.8	J	0.92	В	0.78	В	0.71	J
COBALT	1	NS	3.6		12.3		3.0		3.3		3.1		2.3	Κ
COPPER	2	1300	0.52	В	0.29	В	0.66	J	3.4		0.37	В		
IRON	100	NS	12700		4360		4660		4820		6970		6980	
LEAD	1	15			0.52	В	0.27	В	1.2		0.14	В		
MAGNESIUM	5000	NS	4570	J	14600		19300		20500		18100		18400	
MANGANESE	1	NS	212		121		107		108		163		146	Κ
MERCURY	0.2	2												
NICKEL	1	NS	2.1		22.0		7.8		7.9		5.7		3.1	Κ
POTASSIUM	5000	NS	5990		997	J	1460	J	1460	J	2120	J	2620	J
SELENIUM	5	50		UL										
SILVER	1	NS		UL		UL	0.12	В	0.067	J	0.043	J		
SODIUM	5000	NS	20900		12800		30200		31800		23600		24600	
THALLIUM	1	2												
VANADIUM	5	NS	0.89	В	1.2	В	1.1	В	1.1	В	1.1	В		
ZINC	2	NS	12.8		74.9		6.8		11.4		15.6		10.9	Κ
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



# TABLE 6 ANALYTICAL RESULTS RINSATE BLANK SAMPLES

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

Notes:

 $\mu$ g/L = Micrograms per liter

CRQL = Contract Required Quantitation Limit

# 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

Region III ESAT RPO

TO

: Christine Wagner

Regional Project Manager (3HS32)

is the inorganic data validation report Attached 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) (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.

Blank Affected Analytes

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 OUALIFIER 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

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

<sup>•</sup> See explanation of comments in Table 1B

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

Case 37813, SDG MC02C2

ANALYTE Se	SAMPLES AFFECTED MC02C1, MC02C2, MC02C5, MC02C6, MC02C7, MC02C8, MC02C9, MC02D0, MC02D1	POSITIVE VALUES	NON- DETECTED VALUES UL	BIAS Low	COMMENTS* 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	В		High	CCB (0.087 J ug/L) MSL (49%)
	MC02D2, MC02D3	В		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	В	•	High	CCB (0.240 J ug/L)
	MC02D2, MC02D3, MC02D4, MC02D5, MC02D6, MC02D7, MC02D8, MC02D9, MC02E0, MC02E1	В		High	CCB (0.263 J ug/L)

<sup>\*</sup> 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  $(\le 5X)$  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 (≤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)

SDG: (b) (6)

Number of Soil Samples: 0

Site: Lab.: BATTLEFIELD GOLF CLUB

CHEM

Number of Water Samples: 20

**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	90000
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONÝ	2	0.25	В	1.2	В	Mary Land				10	
*ARSENIC	1	1.5		1.6		1.5		1.6		1.6	
BARIUM	10	27.2		1.1	В	26.7		12.4		1.4	В
BERYLLIUM	1	0.11	J								
*CADMIUM	1	0.11	В	0.16	В	0.12	В	100			
*CHROMIUM	2	0.73	В	0.88	J	0.71	В	0.74	J	0.60	В
COBALT	- 1	0.15	В	0.35	В	0.13	В	0.16	В	100	
COPPER	2	1.3	J	2.7	000 May 2007200000	1.4	J	2.5		, 1.4	J
*LEAD	1	0.29	J	0.31	В	0.25	J	0.11	J	0.24	J
MANGANESE	1	14.4	2020	18.0		14.7		91.4		8.0	
*NICKEL	1	0.75	J	1.3		0.52	J	0.69	J	0.36	В
SELENIUM	5		UL		UL	1.8	J		UL		UL
SILVER	1	0.090	В	0.080	В	0.067	В		UL		UL
THALLIUM	1			0.14	J	200000000000000000000000000000000000000	34.000000000000000000000000000000000000			***************************************	
VANADIUM	5	0.78	В	0.93	В	0.30	В	0.98	В	0.98	В
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)

SDG : (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

#### **Total Metals**

Sample Number :		(b) (6)		(b) (6)	and the same of th	(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	В	1.4		1,3	В	1.4	
BARIUM	10	1.2	В	76.5		8.2	J	10.0	J	19.3	
BERYLLIUM	1			0.27	J						
*CADMIUM	1			DIVIDENCE	0	`					
*CHROMIUM	2	0.68	В	1.1	J	0.63	В	0.65	В	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	В	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	В	1.5	J·	1.2	В	0.59	В	0.37	В
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)

SDG : (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

**Total Metals** 

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)	CENTERCOL	(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	В								
*ARSENIC	1	1.4	30300 \$500 00 are care	1.4		1.6	. 2010 - 2010 20 2000 20	1.7		1.4	m122220 > 1115 N
BARIUM	10	12.9		11.6		88.5		83.7		18.7	
BERYLLIUM	1		Amountains russi							MARKET TO THE RESERVE	
*CADMIUM	1	0.13	В	0.12	В						
*CHROMIUM	2	0.59	В	0.62	В	0.91	J	0.61	В	0.56	В
COBALT	1	0.13	В								
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	X	UL	na n	UL		UL		UL		UL
SILVER	1	0.087	В	0.040	В		UL		UL		UL
THALLIUM	1	No. 100 (100 (100 (100 (100 (100 (100 (100	00000 (DATE)		*******				***************************************		
VANADIUM	5	0.81	В	0.80	В	0.61	В	0.69	В	0.70	В
ZINC	2	8.3		10.2		4.0		3.9	<u> </u>	60.2	

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

SDG : (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

#### **Total Metals**

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)		(b) (6)	0000000
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	0000
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	В
BARIUM	10	2.6	В	4.5	В	4.7	В	21.4		1.8	В
BERYLLIUM	1										
*CADMIUM	1		300000000000000000000000000000000000000								
*CHROMIUM	2	0.46	В	0.45	В	0.61	В	0.49	В	0.49	В
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	В	0.37	В	0.49	В	1.2		0.34	В
SELENIUM	5	1.9	J		UL		UL		UL		UL
SILVER	1		UL		UL		UL		UL	27.001.0000.000	UL
THALLIUM	1			16.5							
VANADIUM	5	0.98	В	0.80	В	0.49	В	1.0	В	0.78	В
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)

Appendix C

**Chain-of-Custody Records** 

S	E	P	A
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### **USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record**

Case No:

DAS No:

37814 37813

Region: Project Code:	3 CT4354	Date Shipped: 9/2/2008 Ch		Chain of Custody Re	cord	Sampler Signature: Ewk	
Account Code:		Airbill:		Relinquished By	(Date / Time)	Received By	(Date / Time)
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting	1			
Spill ID:	ALM	.,	Group (CHEMED)			<del> </del>	
Site Name/State:	Battlefield Golf/VA		284 Sheffield Street	2.			
Project Leader:	Erik Armistead		Mountainside NJ 07092 (908) 789-8900	3.			
Action:	Preliminary Assessment		(000) 100 0000				
Sampling Co:	Tetra Tech EM Inc.			4.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION		E/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 <sub>.</sub>	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 Dis	s 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.



# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No:

37814 37 813

DAS No:

Region: Project Code:	3	3 CT4354		Date Shipped:	9/2/2008		Chain	of Custody R	ecord		Sampler Signature:	(Suited)	
Account Code:	CT4	354			Carrier Name: Airbill:	FedEx 961942977974,		Relinqu	ished By	(Date / Tim	ne)	Received By	(Date / Time)
CERCLIS ID:	VAN	10003066	14		Shipped to:	ChemTech Cons	ultina	1	7-11				· · · · · · · · · · · · · · · · · · ·
Spill ID:	ALN	1				Group (CHEMED	)	2.	·				
Site Name/State:		lefield Go				284 Sheffield Stre Mountainside NJ		Z.					
Project Leader:		Armistea iminary A		\nt		(908) 789-8900	07002	3.					
Action: Sampling Co:		a Tech E		#11L				4.					
		****										_	
INORGANIC SAMPLE No.		TRIX/ IPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG N PRESERVATI		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	QC Type
	Potable V Erik Armis		M/G	TAL TM+B+M (14)	799 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	16:45			
	Potable V Erik Armis		M/G	TAL TM+B+M (14)	801 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	10:43 /			
/ /	Potable V Erik Armis		M/G	TAL TM+B+M (14)	802 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/25/2008	10:40 /			
	Potable V Erik Armis		M/G	TAL TM+B+M (14)	803 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	11:24			
	Potable V Erik Armis		M/G	TAL TM+B+M (14)	804 (HNO3) (1)		(b) (6)(b) (6)	•	6: 8/25/2008	11:31 /			
/ ( - /	Potable W Erik Armis		M/G	TAL TM+B+M (14)	805 (HNO3) (1)		(b) (6)(b) (6)	•	6: 8/25/2008	13:28 /			
- / ( - /	Potable W Erik Armis		M/G	TAL TM+B+M (14)	806 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	13:36 /			
/ ( - /	Potable W Erik Armis		M/G	TAL TM+B+M (14)	807 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/25/2008	14:16 /			~~
/ ( - /	Potable W Erik Armis		M/G	TAL TM+B+M (14)	808 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	15:15 /			
/ . / - /	Potable W Erik Armis		M/G	TAL TM+B+M (14)	809 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	16:23 🗸			
- / ( - /	Potable W Erik Armis		M/G	TAL TM+B+M (14)	810 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	19:19 /			
Shipment for Case	S	Sample(s) to	o be used i	or laboratory QC:		Additional Sampler S	Signature(s):					Chain of Custody Sea	al Number:
Complete? Y		-F1-7		^								·	
Analysis Key:	- 1	Concentrat	ion: L	= Low, M = Low/Medium, H	= High	Type/Designate:	Composite = C,	Grab = G				Shipment Iced?	
	TAL Diss	Metals+E	Boron+Mo	oly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum, TA	AL TM+B+M =	AL Tot	al Metals+Boro	n+Moly			
									*****				

TR Number: 3-375524367-090108-0001

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



# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

37814 37813 Case No: DAS No:

Region: Project Code:	3	3 CT4354		Date Shipped: 9/2/2008  Carrier Name: FedEx			Chaii	of Custody R	ecord		Sampler Signature:	Mistral	
Account Code:	UI	4354			Airbill:	961942977974,		Relinq	uished By	、 (Date / Tim	ie)	Received By	(Date / Time)
CERCLIS ID:	VA	N0003066	614		Shipped to:	ChemTech Cons	ulting	1					
Spill ID:	AL	M				Group (CHEMED	))	2.					
Site Name/State:		ttlefield G			No.	284 Sheffield Stre Mountainside NJ		<u>.</u>					
Project Leader:		ik Armiste: eliminary A		ont.	and a special	(908) 789-8900		3.					
Action: Sampling Co:		tra Tech E		Rill	NA THE BEST OF THE		•	4.					
								L					
INORGANIC SAMPLE No.		ATRIX/ MPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG N PRESERVATI		STATION LOCATION		SAMPLE DAT	E/TIME		GANIC PLE No.	QC Type
(b) (6)	Potable Erik Arm		M/G	TAL TM+B+M (14)	811 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	19:19 /			
(b) (6)	Potable Erik Arm		M/G	TAL TM+B+M (14)	812 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	20:15 🗸			<b>~~</b>
(b) (6)	Potable Erik Arm		M/G	TAL TM+B+M (14)	813 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/26/2008	7:46 /			••
(b) (6)	Potable Erik Arm		M/G	TAL TM+B+M (14)	814 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/26/2008	8:19 /			
	Potable ' Erik Arm		M/G	TAL TM+B+M (14)	815 (HNO3) (1)	3	(b) (6)(b) (6)	•	S: 8/26/2008	9:18 🗸			
/ ( - /	Potable ' Erik Arm		M/G <sub></sub>	TAL TM+B+M (14)	816 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/26/2008	9:15 /			
	Potable ' Erik Arm		M/G	TAL TM+B+M (14)	81,7 (HNO3) (1)	·	(b) (6)(b) (6)	i	S: 8/26/2008	10:26			
/ ( - /	Potable ' Erik Arm		M/G	TAL TM+B+M (14)	818 (HNO3) (1)		(b) (6)(b) (6)	ı	S: 8/26/2008	10:50			
	Potable ' Erik Arm		M/G	TAL TM+B+M (14)	819 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	11:33			
	Potable T Erik Arm		M/G	TAL TM+B+M (14)	820 (HNO3) (1)		(b) (6)(b) (6)	J	S: 8/26/2008	11:26			
/ ( - /	Potable Erik Arm		M/G	TAL TM+B+M (14)	821 (HNO3) (1)	•	(b) (6)(b) (6)		S: 8/26/2008	11:26			
Shipment for Case		Sample(s) t	o be used t	for laboratory QC:		Additional Sampler S	Signature(s):				l	Chain of Custody Seal N	lumber:
Complete? Y													ECOLUTION AND AND AND AND AND AND AND AND AND AN
Analysis Key:		Concentrat	tion: L	. = Low, M = Low/Medium, H	= High	Type/Designate:	Composite = C, (	Grab = C	· · · · · · · · · · · · · · · · · · ·		!	Shipment Iced?	
FAL DM+B+M =	TAL Diss	s Metals+l	Boron+M	oly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum, TA	AL TM+B+M = T	AL To	tal Metals+Boro	n+Moly			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

## U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF#

37813

Date: 8/21/2008		Site Activi	ty: Removal Assessme	nt			
Site Name: Battlefield	Golf Club			Street A	Address: 1001 South C	enterville Turnpike	
City: Chesapeake			State: VA	Latitud	le: 36.68982		Longitude: 76.17790
Program: Superfund			Acct. #: 2008T03 N 30	2DC6C	A3LM RS00	CERCLIS #: VANOOO3	306614
Site ID:			Spill ID: A3LM			Operable Unit:	
Site Specific QA Plan	Submitted:	]No ⊠Y€	es Title: Battlefield Go	olf Club l	Fly Ash Assessment SA	AP	Date Approved: 8/20/2008
EPA Project Leader: (	CHRIS WAGNE	ER	Phone#:	Phone#: Cell Phone #: 804-337-3049			E-mail: Wagner.Christine@epa.gov
Request Preparer: JOS	SHUA COPE		Phone#: 610-364-2	2130	Cell Phone #: 215-7	68-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK AF	RMISTEAD		Phone#: 610-364-2	2151	Cell Phone #: 267 44	46 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lorr	ie Murra	ny/Karen Wodarczyk		
#Samples 30-35	Matrix: soil		Parameter: TAL M	1etals + 1	Boron + Molybdenum	+ Hg CHEM	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groun	dwater	Parameter: TAL N	1etals + 1	Boron + Molybdenum	+ Hg	Method: ILM05.4 ICPAES+Hg
#Samples 90-110	ples 90-110 Matrix: potable water Parameter: T				w(w/o Al,Ca,Fe,K,Mg	,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg
#Samples 90-110	Matrix: potabl	e water	Parameter: Al, Ca,	Fe, K, N	Mg, Na	,	Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groun	dwater	Parameter: TAL m	etals Lo	w(w/o Al,Ca,Fe,K,Mg,	Method: ILM05.4 ICPMS & Hg	
#Samples 20-25	Matrix: ground	dwater	Parameter: Al, Ca,	Fe, K, N	Mg, Na		Method: ILM05.4 ICPAES
#Samples	Matrix:		Parameter:				Method:
#Samples	Matrix:		Parameter:				Method:
Ship Date From: 8/29/	2008	Ship Dat	e To: 9/3/2008	Org. Va	alidation Level		Inorg. Validation Level IM2
Unvalidated Data Requ	iested: No	⊠ Yes	If Yes, TAT Needed:	☐ 24hr	rs 48hrs 72hrs	s □7days ⊠ Other (	(Specify)14 days
Validated Data Packag	e Due: 🔲 14 d	lays 🔲21	days. 🛛 30days 🔲	42 days	· Other (Specify)		
Electronic Data Delive	rables Required:	No [	Yes (EDDs will be	e provide	ed in Region 3 EDD Fo	rmat)	
Special Instructions: So	ee attached DLs.						
		`					
							•

# Appendix D

**Laboratory Case Narrative** 

### USEPA - CLP

### COVER PAGE

Lab Name CHEMTEC	H CONSULTING GROUP	Contract: EPW0604	17		
Lab Code: <u>CHEM</u>	Case No.: <u>37813</u>	NRAS No.:	SDC	G No.: MC02	C2
SOW No.: <u>ILM05.4</u>					
	EPA Sample No.		Lab Sa	mple ID	
	MC02C1		_Z4424	4-02	
	MC02C2		_Z4424		
	MC02C3		Z4424		
	MC02C5		Z4424		
,	MC02C6 MC02C7		Z4424 Z4424		
•	MC02C8		Z4424		
	MC02C9		Z4424		
	MC02D0		Z4424		<del></del>
	MC02D1		Z442		
	MC02D2		Z4424		
	MC02D3		Z4424		
	MC02D4 MC02D5		Z4424 Z4424		MATERIAL PROPERTY AND ADMINISTRATION OF THE PROPERT
	MC02D6		Z4424 Z4424		
	MC02D7		Z442		*******
	MC02D8		Z442		
	MC02D9		Z442		<del></del>
	MC02E0		Z442		
	MC02E1		Z442		
	MC02E1D		Z442		<del></del>
	MC02E1S		Z442	4-22	_
				ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correction	ons applied?	(Yes/No)		YES
	CP-MS background correction	ns applied?	(Yes/No)		YES
If yes, were raw dat application of back			(Yes/No)		<u>NO</u>
Comments:					
			· · · · · · · · · · · · · · · · · · ·		
completeness, for other and in the computer-re	package is in compliance with r than the conditions detailed adable data submitted on disk has been authorized by the L	above. Release of the ette (or via an alterna	e data contained te means of ele	I in this harded ctronic transm	opy data package ission, if approved
TOHOWING SIGNATURE					
Signature:	£ 0	Name: (b) (4)(b) (4	4)		
Date:	7/16/08	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: <u>Presence</u>/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 Name: (b) (4)(b) (4)

Date 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

Region III ESAT RPO

TO

: Christine Wagner

Regional Project Manager (3HS32)

Attached is the inorganic data validation report 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

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)

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.

Blank Affected Analytes

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, ± 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.

Original Sample Number	New Sample Member
MC02A1	MC1GF1
MC02A2	MC1GF2
MC02A3	MC1GF3
MC02A4	MC1GF4

0.1.110 1.37 1	; NT (1 1 N# 1
Original Sample Number	New Sample Member
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

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

<sup>\*</sup> See explanation of comments in Table 1B

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

Case 37813, SDG MC1GF2

ANALYTE Se	SAMPLES AFFECTED MC1GF1, MC1GF2, MC1GF3, MC1GF4	POSITIVE VALUES	NON- DETECTED VALUES UL	BIAS Low	COMMENTS* 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	В		High	CCB (0.117 J ug/L) MSL (49%)
	MC1GG5, MC1GG6, MC1GG7	В		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	В		High	CCB (0.117 J ug/L)
V	MC1GF1, MC1GF3, MC1GF4, MC1GF5, MC1GG2, MC1GG3, MC1GG4, MC1GG5, MC1GG6, MC1GG7			High	PB (0.236 J ug/L)

<sup>\*</sup> 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 rersults 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)

SDG: MC1GF2

BATTLEFIELD GOLF CLUB

Site : Lab. :

CHEM

Dissolved Metals

Number of Soil Samples: 0

Number of Water Samples: 17

Sample Number :	***********	MC1GF1	*************	MC1GF2	********	MC1GF3		MC1GF4		MC1GF5	
Sampling Location :	mpling Location : BG08-GW-MP01				BG08-GW-MP02			BG08-GW-MP04		BG08-GW-MP05	
Matrix :	atrix : 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	В	1.2	В	0.25	В	0.23	В	0.21	В
*ARSENIC	1	1.3	В	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	В	0.13 B						0.18	В
*CHROMIUM	2	0.73	В	1.5	1.5 J		1.7 J		J	1.2	J
COBALT	1	1.9		14,1		7.0		4.0		0.27	В
COPPER	2	0.69	J	0.55	В	0.39	В	0.37	В.	0.43	В
*LEAD	1	0,26	В	0.26	В	0.25	В	0.12	В	0.16	В
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	В	0.070	В		UL		UL	0.067	В
THALLIUM	1	0.17	В	0.15	В						grand and a second
VANADIUM	5	0.69	В	1.4	J	1.0	В	0.67	В	0.90	В
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)

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	0000000								
Units :		ug/L	Diagona								
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	В	0.21	В						
*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		B 1.4		1.4	J.
COBALT	1	1.1		50.4		12.1	12.1			2.9	
COPPER	2	0.39	В	0.34	В	0.62	J	0.35	В	0.40	В
*LEAD	. 1	0.20	В	0.12	В	0.15	В	0.10	В	0.10	В
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	В	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)

SDG: MC1GF2

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

**Dissolved Metals** 

Sample Number :	mple Number : MC1GG1				MC1GG2			MC1GG4		MC1GG5	
Sampling Location :	mpling Location : BG08-GW-MP			BG08-GW-MI	712	BG08-GW-MP13		BG08-GW-MW01		BG08-GW-MW02	
Field QC:							<b>1</b> 5.		Dup. of MC1G0	Э6	
Matrix :	Water		Water		Water		Water		Water	350000	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	900
Date Sampled :		8/28/2008		8/28/2008		8/28/2008		8/29/2008		8/29/2008	00000
Time Sampled :		13:48		13:05		13:25		15:55		13:50	and the same of th
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	В
*ARSENIC	1	4.3		1.2	В	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					Ì				0.14	J
*CHROMIUM	2	2.1		0.68	В	1.4 J		0.85 B		1.8	J
COBALT	1	0.48	В	1.6		3.6		12.3		3.0	-
COPPER	2	0.30	В	0.55	В	0.52	В	0.29	В	0.66	J
*LEAD	1							0.52	В	0.27	В
MANGANESE	- 1	126		206		212		121		107	
*NICKEL	1	0.66	В	2.3		2.1		22.0		7.8	
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL		UL		UL		UL	0.12	В
THALLIUM	1									10.00	
VANADIUM	5	3.6	J	1.1	В	0.89	В	1.2	В	1.1	В
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)

SDG: MC1GF2

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

**Dissolved Metals** 

Sample Number :		MC1GG6		MC1GG7							
Sampling Location :		BG08-GW-MW	02D	BG08-GW-M\	W03						,
Field QC:		Dup. of MC1GG	5								
Matrix :		Water		Water							
Units :		ug/L		ug/L							
Date Sampled :		8/29/2008		8/29/2008							
Time Sampled :		13:50		14:50							
Dilution Factor :	Purway on accompany	1.0		1.0	W.Sunners and						
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	7.0		3.0				10			
BARIUM	10	19.0		18.1	*		************				
BERYLLIUM	1	0.11	J	14.65							
*CADMIUM	1							WANTED COLOR OF THE STREET OF			
*CHROMIUM	2	0.92	В	0.78	В						
COBALT	1	3.3		3.1			000000000000000000000000000000000000000				
COPPER	2	3,4		0.37	В						
*LEAD	1	1.2		0.14	В	÷					9
MANGANESE	1	108		163							
*NICKEL	1	7.9		5.7			***************************************				
SELENIUM	5		UL		UL						
SILVER	1	0.067	В	0.043	В		00012222022	200000000000000000000000000000000000000			
THALLIUM	1									100	
VANADIUM	5	1.1	В	1.1	В						
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)

Appendix C

**Chain-of-Custody Records** 

# SEPA USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: DAS No:

Region: Project Code: Account Code: CERCLIS ID: Spill ID:	3 CT4354 VAN000306 ALM	6614		Shipped to: Chem	,00	Relinquished By	(Date / Tim	Sampter Signature:	(Date / Time)
Site Name/State Project Leader: Action: Sampling Co:		ead Assessm	ent	284 Sheffield Street Mountainside NJ 07092 (908) 789-8900		<ul><li>2.</li><li>3.</li><li>4.</li></ul>			
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bott	STATION les LOCATION		E COLLECT TE/TIME	ORGANIC SAMPLE No.	QC Type
MC02A1 men GF1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	777 (HNO3), 891 (HNC (2)	93) BG08-GW-MP	01 S: 8/28/2008	12:40		**
MC02A2 MC161FZ	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	778 (HNO3), 892 (HNC (2)	BG08-GW-MP	02 S: 8/29/2008	11:15		
MC02A3 <b>mc1 G F 3</b>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	779 (HNO3), 893 (HNC (2)	BG08-GW-MP	03 S: 8/29/2008	10:00		
MC02A4 MC164	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	780 (HNO3), 894 (HNC (2)	BG08-GW-MP	04 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 (HNC (2)	93) BG08-GW-MP	05 S: 8/28/2008	15:50		Aud
MC02A6 MC167F6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	782 (HNO3), 896 (HNC (2)	93) BG08-GW-MP	06 S: 8/28/2008	17:47		
MC02A7 mc167 F7	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	783 (HNO3), 897 (HNC	BG08-GW-MP	07 S: 8/28/2008	18:10		
MC02A8 か <i>い</i> らら	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	784 (HNO3), 898 (HNO	BG08-GW-MP	08 S: 8/29/2008	9:10		J.,
MC02A9	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	785 (HNO3), 899 (HNC	BG08-GW-MP	09 S: 8/29/2008	10:50		
MC02B0 <b>ო (                                   </b>	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	786 (HNO3), 900 (HNO	BG08-GW-MP	10 S: 8/29/2008	11:50		~~
MC02B1 かに i いい i	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	787 (HNO3), 901 (HNO (2)	BG08-GW-MP	11 S: 8/28/2008	13:48		
Shipment for Case Complete? Y	Sample(s	) to be used	for laboratory QC:	Additio	onal Sampler Signature(s):		•	Chain of Custod	y Seal Number:
ED-ECCORDINATION OF THE PERSON			`						
Analysis Key:	Concentr		L = Low, M = Low/Medium, H	.9	/Designate: Composite = C, (			Shipment Iced?	
TAL DM+B+M :	TAL Diss Metals	+Boron+N	loly, TAL Met+B+ = TA	L Metals + Boron + Moly	bdenum, IAL IM+B+M = I	AL Total Metals+Bor	on+Moly		

TR Number: 3-375524367-090108-0001

# SEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No:

DAS No:

<del>37814</del> 37813

Region: Project Code:	3			Date Shipped:	9/2/2008		Cha	in of Custody R	ecord		Sampler Signature:	it austral
Account Code:	CT4354			Carrier Name: Airbill:	FedEx 96194297	7074	Relin	quished By	(Date /	Time)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	6614		Shipped to:		Consulting	1		`			
Spill ID:	ALM			отррец го.	Group (Ch	•	<u> </u>					
Site Name/State:	Battlefield	Golf/VA			284 Sheffi		2.					
Project Leader:	Erik Armist	ead			(908) 789-	ide NJ 07092 8900	3.					
Action:	Preliminary	/ Assessm	ent		(000)		<u> </u>					
Sampling Co:	Tetra Tech	EM Inc.					4.					
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND		No./ TIVE/ Bottles	STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	QC Type
MC02B2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 9 (2)	02 (HNO3)	BG08-GW-MP	12	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), 9 (2)	03 (HNO3)	BG08-GW-MP	13	S: 8/28/2008	13:25			
MC02B4 Mc l WG H	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 9 (2)	04 (HNO3)	BG08-GW-MW	/01	S: 8/29/2008	15:55			
MC02B5 MC10605	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 9 (2)	05 (HNO3)	BG08-GW-MW	/02	S: 8/29/2008	13:50			
MC02B6	Ground Water/ Erik Armistead	M/G <sub>.</sub>	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 9 (2)	06 (HNO3)	BG08-GW-MW	02D	S: 8/29/2008	13:50			
MC02B7 かい <b>い</b> いつ	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 9 (2)	07 (HNO3)	BG08-GW-MW	/03	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), 9 (2)	08 (HNO3)	BG08-SW-SW	'01	S: 8/29/2008	12:51			
MC02B9 mc\いい <sup>9</sup>	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 9 (2)	09 (HNO3)	BG08-SW-SW	02	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 (HŅO3) (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			<del></del>
Shipment for Case Complete? Y	Sample(s	s) to be used	for laboratory QC:		Additional S	ampler Signature(s):					Chain of Custody	Seal Number:
Analysis Key:	Concent	ration:	L = Low, M = Low/Medium, F	I = High	Type/Desig	nate: Composite = C.	Grab =	G			Shipment Iced?	
TAL DM+B+M =	TAL Diss Metals	+Boron+M	loly, TAL Met+B+ = TA	L Metals + Boro	n + Molybden	ium, TAL TM+B+M =	TALT	otal Metals+Boro	n+Moly		***************************************	

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

# U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF#

378/3

Date: 8/21/2008		Site Activi	: Removal Assessment								
Site Name: Battlefield Golf Club					Address: 1001 South C	enterville Turnpike					
City: Chesapeake State: VA				Latitud	le: 36.68982		Longitude: 76.17790				
Program: Superfund	_		Acct. #: 2008T03 N 30	2DC6C	A3LM RS00	CERCLIS #: VAN0003	306614				
Site ID:			Spill ID: A3LM			Operable Unit:					
Site Specific QA Plan	Submitted:	]No ⊠Yo	es Title: Battlefield Go	olf Club 1	Fly Ash Assessment SA	AР	Date Approved: 8/20/2008				
EPA Project Leader:	CHRIS WAGNE	ER	Phone#:		Cell Phone #: 804-33	37-3049	E-mail: Wagner.Christine@epa.gov				
Request Preparer: JO	SHUA COPE		Phone#: 610-364-	2130	Cell Phone #: 215-76	68-8114	E-mail: Joshua.cope@ttemi.com				
Site Leader: ERIK Al	RMISTEAD		Phone#: 610-364-	2151	Cell Phone #: 267 44	46 2837	E-mail: Erik.armistead@ttemi.com				
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lon	ie Murra	ny/Karen Wodarczyk						
#Samples 30-35 Matrix: soil Parameter: TAI					Boron + Molybdenum -	+ Hg CHEM	Method: ILM05.4 ICPAES+Hg				
#Samples 20-25 Matrix: groundwater Parameter: TAL I					Boron + Molybdenum -	+ Hg	Method: ILM05.4 ICPAES+Hg				
#Samples 90-110	Matrix: potabl	e water	Parameter: TAL m	netals Lo	w(w/o Al,Ca,Fe,K,Mg,	,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg				
#Samples 90-110	Matrix: potabl	e water	Parameter: Al, Ca,	, Fe, K, N	Mg, Na		Method: ILM05.4 ICPAES				
#Samples 20-25	Matrix: groun	dwater	Parameter: TAL m	netals Lo	w(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg				
#Samples 20-25	Matrix: ground	dwater	Parameter: Al, Ca,	Fe, K, N	Лg, Na		Method: ILM05.4 ICPAES				
#Samples	Matrix:		Parameter: -	- Carrier - Carrier - Na			Method:				
#Samples	Matrix:		Parameter:				Method:				
Ship Date From: 8/29.	/2008	Ship Dat	e To: 9/3/2008	Org. Va	alidation Level		Inorg. Validation Level 1M2				
Unvalidated Data Req	uested: No	⊠ Yes	If Yes, TAT Needed:	☐ 24hr	s 🗌 48hrs 🔲 72hrs	5 ☐7days ☒ Other (	(Specify)14 days				
Validated Data Package Due: 14 days 21 days 30days 42 days Other (Specify)											
	Electronic Data Deliverables Required: 🗌 No 🛛 Yes (EDDs will be provided in Region 3 EDD Format)										
Special Instructions: S	ee attached DLs.										
		,	3								

# Appendix D

**Laboratory Case Narrative** 

#### USEPA - CLP

### COVER PAGE

Lab Name CHEMTECH CONSULTING GROUP Contract: EPW06047					
Lab Code: CHEM	Case No.: <u>37813</u>	NRAS No.:	SD	G No.: MC1G	F2
SOW No.: ILM05.4					
	EPA Sample No.		Lab Sa	mple ID	
	MC1GF1		Z449		
	MC1GF2		<u>Z449</u>		
	MC1GF3		Z449		
	MC1GF4		Z449 Z449		
,	MC1GF5 MC1GF6		Z449 Z449		
,	MC1GF7		Z449		
	MC1GF8		Z449		
•	MC1GF9	*	Z449		
	MC1GG0		Z449	1-10	
	MC1GG1		Z449		
	MC1GG2		Z449		_
	MC1GG3 MC1GG4		<u>Z449</u> Z449		
	MC1GG5		Z449 Z449		
	MC1GG6		Z449		
	MC1GG7		Z449		<del></del>
	MC1GG7D		Z449		
	MC1GG7S		Z449	1-19	
					<del></del>
				ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correction	ons 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:					
***					
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.  Name: (b) (4)(b) (4)					
Date:	116/08	Title: (b) (4)(b) (4	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 (AI, 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 1<sup>st</sup> container and use the 2<sup>nd</sup> container as extra volume if needed. Are the laboratory's proposed actions acceptable to the Region?

# 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 Surface Water ICP-AES TM+B+Mo by MA 1629.0 and Hg

Potable Well

ICP-AES TM+B+Mo by MA 1629.0 and Hg ICP-AES (AI, 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.

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).

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
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.

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

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

Received By (Print N	lame) (b) (4) (b) (b)	(4)				Log-in Date 9/9/2008
Received By (Signat	ure)(D) (4)(D					MANAGEMENT CONTRACTOR OF THE PROPERTY OF THE P
Case Number 378	<del>честроння востология в при в при</del>	Sample Deliv	ery Group	No. MC1GF2	NRAS Nur	mber
Remarks:				Corresp	onding	2274.003. W. 3. S. 4200.000/journal.com/
Custody Seal(s)	resent Absent*					Remarks:
2. Custody Seal Nos.	(ntact) Broken	EPA Sample			Assigned	Condition of Sample shipment,
3. Traffic Reports/Chain Of	Present Absent*	#	pH	Sample Tag #	Lab #	etc.
Custody Reports or Packing Lists		MC1GF2	N/4	8 92	Z4491-01	INTACT
4. Airbill	Airbill/Sticker	MC1GF1		MMC0 841	Z4491-02	
4. Alluni (	Present/Absent*	MC1GF3	. \	8 893	Z4491-03	
5. Airbill No.	961942977974	MC1GF4	-	894	Z4491-04	
	es places ou annual	MC1GF5		895	Z4491-05	
6. Sample Tags Sample Tag #	Present/Absent*	MC1GF6		896	Z4491-06	
, ,	On TR/Chain-of-Custody	MC1GF7		897	Z4491-07	
7. Sample Condition	Intact/Broken*/Leaking	MC1GF8	-	8 98	Z4491-08	<u> </u>
Cooler Temperature     Indicator Bottle	Present/Absent*	MC1GF9		899	Z4491-09	
	4°c	MC1GG0		\$ 900	Z4491-10	
9. Cooler Temperature	Ve/No*	MC1GG1	4 1	8 9 0 1	Z4491-11	
10. Does information on custody	CES/ NO.	MC1GG2		8 900	Z4491-12	
records, traffic reports, and		MC1GG3	_	8 903	Z4491-13	
sample tags		MC1GG4		८ १०५	Z4491-14	
aggree?		MC1GG5	] ]	8 905	Z4491-15	
<ol> <li>Date Received at Lab</li> </ol>	9.3.08	MC1GG6	]	8 906	Z4491-16	
12. Time Received	9:30 n ru	MC1GG7		8 907	Z4491-17	
	. T	MC1GG7D		8 907	Z4491-18	
	le Transfer	MC1GG7S	V	8 907	Z4491-19	. 4
Fraction METALS	Fraction					
Area # QSƏ	Area #			1		
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On 9.16.08	on "					
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Reviewed By (b) (4)			ogbook N		4)	
Date <i>9-16-08</i>		L	ogbook P	age No. (b)	47/16/08	renner vide et 1882 biod 1820 N.H. Andrew er verkelbei vide 1820 Williamsteren.
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FORM DC-1

ILM05.3



# 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

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



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: MC02A1

Site: Battlefield Gold Club

FROM:

(b) (4)

Inorganic Data Reviewer

(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  $\mu$ g/L and 5  $\mu$ g/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.

Blank Affected Analytes

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 (≤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.

Blank Affected Analytes

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.

Sample ID on COC	<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

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED VALUES	BIAS	COMMENTS*
Al	MC02L1		UL	Low	CBN (-23.640 µg/L)
Sb	MC1GG8	В		High	CCB (2.315 J µg/L)
В	MC1GG8, MC1GG9	В		High	CCB (26.815 J µg/L)
	MC02A2, MC02A3, MC02A4	J			>MDL <crql PBN (-6.080 J μg/L)</crql 
	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	В		High	RB (571 μg/L)
Ρþ	MC02A1, MC02A4, MC02B2, MC02B3, MC02B9	J			>MDL <crql PBN (-1.830 J μg/L)</crql 
	MC02B1, MC02L0		UL	Low	· PBN (-1.830 J μg/L)
Mn	MC02L0	J			>MDL <crql PBN (-1.515 J μg/L)</crql 
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 explana	ation of comments in Ta	ble 1B			

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

Case 37813, SDG MC02A1

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED <u>VALUES</u>	BIAS	COMMENTS*
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)
T1	All Samples Except MC02L1, MC1GG8, MC1GG9		UL	Low	PBN (-3.805 J μg/L)
Zn	MC02A1, MC02A3, MC02A5, MC02B1, MC02B2, MC02B3, MC02B5, MC02B6	В		High	RB (2.1 J μg/L)
	MC02L0	J			>MDL <crql PBN (-2.010 J μg/L)</crql 

<sup>\*</sup> 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 =Reported results are greater than MDLs but less than CRQLs and are considered <CRQL estimated. PBN ,= Preparation blanks had negative results with absolute values >MDLs [results are in parenthesis]. Positive results which are ≤2X the absolute values of the blank concentrations and quantitation limits may be biased low. RBRinsate 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

SDG: MC02A1

BATTLEFIELD GOLF CLUB

Number of Soil Samples: 0 Number of Water Samples: 23

Site : Lab. :

CHEM

ALL TOTAL METALS

Sample Number :		MC02A1		MC02A2		MC02A3	KIKIKKKI KA	MC02A4		MC02A5	
Sampling Location :		BG08-GW-M	P01	BG08-GW-N	1P02	BG08-GW-MP03		BG08-GW-MP04		BG08-GW-MP05	
Matrix :		Water	Water \			Water		Water		Water	
Units :		ug/L	ug/L ι			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	ereneway.	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	В	60.6		9.8	В	. 12.8	J	6.4	В

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

Page \_\_2\_ of \_\_5\_\_

### **DATA SUMMARY FORM: INORGANIC**

Case #: 37813

SDG: MC02A1

Site:

**BATTLEFIELD GOLF CLUB** 

Lab.:

CHEM

# ALL TOTAL METALS

Sample Number :		MC02A6		MC02A7	erecekkaren	MC02A8	********	MC02A9	TOTAL CONTRACTOR	MC02B0	
Sampling Location :		BG08-GW-MI	P06	BG08-GW-N	/IP07	BG08-GW-MP08		BG08-GW-MP09		BG08-GW-MP10	
Matrix :		Water		Water		Water		Water		Water	
Units:		ug/L	ug/L u			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	100		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)

SDG: MC02A1

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

# ALL TOTAL METALS

Sample Number :	***************	MC02B1	20010000000000	MC02B2		MC02B3		MC02B4		MC02B5	
Sampling Location :		BG08-GW-M	P11	BG08-GW-N	/IP12	BG08-GW-N	/IP13	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	The state of the s
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	- 1									
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	В	4.2	В	7.1	В	70.8		8.6	В
CROL = Contract Required Quantitation				Leval Eviete				NADDATIVE			

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

SDG: MC02A1

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

# ALL TOTAL METALS

Sample Number :		MC02B6		MC02B7		MC02B8		MC02B9		MC02L0	
Sampling Location :		BG08-GW-M	W02D	BG08-GW-N	/W03	BG08-SW-SW01		BG08-SW-SW02		BG08-RB01	
Field QC :		Dup of MC02	B5							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	8
Time Sampled :		13:50		14:50		12:51		15:40		10:15	000
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	В	1140	В	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	100				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	В	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)

SDG: MC02A1

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

		TOTAL		DISSOLV	'ED	DISSOLV	/ED		***********		***************************************
Sample Number :		MC02L1		MC1GG8		MC1GG9					
Sampling Location :		BG08-RB02		BG08-SW-S	W01	BG08-SW-S	W02				
Field QC:		Rinsate Blanl	k	200							
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 :	440000000000000000000000000000000000000	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	В						
*ARSENIC ,	10										
BARIUM	200			33.3	J	40.6	J				
BERYLLIUM	5			0.52	J	0.50	J	***************************************			
BORON	50			34.8	В	30.9	В				
*CADMIUM	5						AND THE RESERVE OF THE PARTY OF			44444	
CALCIUM	5000	527	J.	18400		23300					
*CHROMIUM	10	00000000000000000000000000000000000000			*************		******************	**************************************			
COBALT	50			4.8	J	8.2	J				
COPPER	25		#7.ven222100000		d5manarainda			manageris error in a constant and a	anning a constru		
IRON	100	571		665	В	254	В				
*LEAD	10				10.50 10.50 00.000 00.000 00.000 00.000 00.000 00.000 00.000 00.000 00.000 00.000 00.000 00.000 00.000 00.000		**********	AND THE AREA OF THE STREET			
MAGNESIUM	5000	116	J	6520		7510					
MANGANESE	15	.8.0	J	346	200 Aug 2 Aug 2000	339	2000-00-00-000-00-00-00-00-00-00-00-00-0				
MOLYBDENUM	-5,										
MERCURY	0.2		UL		UL		UL				
*NICKĘL	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		<b>a</b>		9

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

# Appendix C

Chain-of-Custody Records

		PA
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# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No:	37874 37813	R
DAS No:		8 6

Region: 3 Project Code: GT 1051			Date Shipped: 9/2/2008 C			Ch	ain of Custody F	recotq		Sampler Signature:	h Churchest	
Account Code:	CT4354			Carrier Name: Airbill:		7074	Rel	inquished By	(Date /	Time)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	96194297	h Consulting	1	6.160-4	1 9/2	la 1200		
Spill ID:	ALM			Snipped to:	Group (Cl		<u> </u>	TWO Christs	7 119	108 1700		
Site Name/State:	Battlefield C	Golf/VA			284 Sheff	ield Street-	2.					
Project Leader:	Erik Armiste	ead			Mountains (908) 789	side NJ 07092	3.					
Action:	Preliminary	Assessm	ent		(900) 709	-0900						
Sampling Co:	Tetra Tech	EM Inc.					4.					
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG PRESERVAT		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	OC Type
MC02A1	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	777 (HNO3), 89 (2)	91 (HNO3)	BG08-GW-MP	01	S: 8/28/2008	12:40			<b></b>
MC02A2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	778 (HNO3), 89 (2)	92 (HNO3)	BG08-GW-MP	02	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), 89 (2)	93 (HNO3)	BG08-GW-MP	203	S: 8/29/2008	10:00			
MC02A4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 89 (2)	94 (HNO3)	BG08-GW-MP	04	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), 89 (2)	95 (HNO3)	BG08-GW-MP	05	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), 89 (2)	96 (HNO3)	BG08-GW-MP	906	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), 89 (2)	97 (HNO3)	BG08-GW-MP	07	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), 89 (2)	98 (HNO3)	BG08-GW-MP	80°	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), 89 (2)	99 (HNO3)	BG08-GW-MP	09	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), 90 (2)	00 (HNO3)	BG08-GW-MP	10	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), 90 (2)	01 (HNO3)	BG08-GW-MP	11	S: 8/28/2008	13:48			
Shipment for Case Complete? Y	Sample(s)	) to be used	for laboratory QC:		Additional S	Sampler Signature(s):					Chain of Custody Seal	Number:
Analysis Key:	Concentra	ation:	L = Low, M = Low/Medium, F	f = High	Type/Desig	gnate: Composite = C.	Grab	= G			Shipment Iced?	
TAL DM+B+M =	TAL Diss Metals	+Boron+N	loly, TAL Met+B+ = TA	L Metals + Boror	+ Molybdei	num, TAL TM+B+M =	TAL	Total Metals+Bord	n+Moly			

TR Number:

TR Number: 3-375524367-090108-0001

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# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 37814 37813 R

										DAG			<u> </u>
Region: Project Code:	Project Code:			Carrier Name: FedEx		Cha	in of Custody Re	córq		Sampler Signature: End Chushod			
Account Code:	C.	T4354			Airbill:	96194297	77074	Reli	nquished By	` (Date /	Time)	Received By	(Date / Time)
CERCLIS ID:	VA	AN0003066	614		Shipped to:		h Consulting	1					
Spill ID:	Al	LM			Simpped to:	Group (Cl						<u> </u>	
Site Name/State	:: Ва	attlefield G	iolf/VA			284 Sheffield Street		2.					
Project Leader:	E	rik Armiste	ead			(908) 789	side NJ 07092 -8900	3.					
Action:		reliminary .		ent		(000).00		4.				<del> </del>	
Sampling Co:	Те	etra Tech l	EM Inc.					7.		(Albania and American States of the States o	ng na Amerikan ng paganakan		
INORGANIC SAMPLE No.		MATRIX/ AMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG PRESERVAT		STATION LOCATION		SAMPLE C DATE/			GANIC PLE No.	QC Type
MC02B2		l Water/ mistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 90 (2)	02 (HNO3)	BG08-GW-MP	12	S: 8/28/2008	13:05			
MC02B3		Water/ mistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 90 (2)	03 (HNO3)	BG08-GW-MP	13	S: 8/28/2008	13:25			
MC02B4		Water/ mistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 90 (2)	04 (HNO3)	BG08-GW-MW	101	S: 8/29/2008	15:55			
MC02B5	Ground Erik Arr		M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 90 (2)	05 (HNO3)	BG08-GW-MW	02	S: 8/29/2008	13:50			
MC02B6	Ground Erik Arr		M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 90 (2)	)6 (HNO3)	BG08-GW-MW0	02D	S: 8/29/2008	13:50			
MC02B7	Ground Erik Arr	Water/ mistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 90 (2)	7.(HNO3)	BG08-GW-MW	/03	S: 8/29/2008	14:50			
MC02B8 MC1668	Surface Erik Arr	Water/ mistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 90 (2)	08 (HNO3)	BG08-SW-SW	01	S: 8/29/2008	12:51			
MC02B9 MC1669	Surface Erik Arr	e Water/ mistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 90 (2)	9 (HNO3)	BG08-SW-SW	02	S: 8/29/2008	15:40			
(b) (6)	Potable Erik Arr		M/G	TAL TM+B+M (14)	796 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/25/2008	9:27			<del></del>
(b) (6)	Potable Erik Arr	Well/ mistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)	ı	(b) (6)(b) (6)		S: 8/25/2008	9:59			a-
(b) (6)	Potable Erik Arr		M/G	TAL TM+B+M (14)	798 (HNO3) (1)	ı	(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:		Concentra	ation:	L = Low, M = Low/Medium, F	= High	Type/Desi	gnate: Composite = C,	Grab :	= G			Shipment Iced?	
TAL DM+B+M =	= TAL Dis	ss Metals+	-Boron+M	ioly, TAL Met+B+ = TA	L Metals + Boror	1 + Molybde	num, TAL TM+B+M =	TAL	Total Metals+Boron	+Moly	<u> </u>	~~~	

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

# SEPA

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 37814 3 >813 DAS No:

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

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION		E COLLECT E/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	Ę.	
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:						
Total Particular	Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High		Shipment Iced?						
and the Control	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

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# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No:	<del>-37814</del>	37813EA	R
DAS No:			11 19

Region: Project Code:	3 CT4354			Carrier Name: FedEx		Chain of Custody Record			Sampler Signature:	Mished
Account Code:	3.100.			Airbill: 96	rbill: 961942977974.	Relinquished By	(Date /	Time)	Received By	(Ďate / Time)
CERCLIS ID:	VAN000306	614		Shipped to: ChemTech Consulting 1		1				
Spill ID:	ALM			ii .	Group (CHEMED)				<u> </u>	
Site Name/State	Battlefield 0	Golf/VA		Mountainside NJ 07092		2.				
Project Leader:	Em / minor					3.				
Action:	Preliminary	Assessm	ent		,					
Sampling Co:	Tetra Tech	EM Inc.				4.				
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ I		SA	MPLE COLLECT DATE/TIME		GANIC PLE No.	QC Type
MC02L1	Ground Water/ Erik Armistead	L/G	TAL TM+B+M (14)	890 (HNO3) (1)	BG08-RB02	S: 8/26/20	08 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:

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

# U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF# 14

37813

Date: 8/21/2008	ate: 8/21/2008 Site Activity: Removal Assessment								
Site Name: Battlefield	Golf Club		Street Ad	dress: 1001 South Ce	enterville Turnpike				
City: Chesapeake		State: VA	Latitude:	36.68982		Longitude: 76.17790			
Program: Superfund		Acct. #: 2008T03 N 30	02DC6C A3	3LM RS00	CERCLIS #: VAN0003	306614			
Site ID:		Spill ID: A3LM			Operable Unit:				
Site Specific QA Plan	Submitted: No 🛛	Yes Title: Battlefield Go	olf Club Fly	Ash Assessment SA	Date Approved: 8/20/2008				
EPA Project Leader: (	Phone#:	Phone#: Cell Phone #: 804-337-30			E-mail: Wagner.Christine@epa.gov				
Request Preparer: JOS	Phone#: 610-364-	-2130	Cell Phone #: 215-76	58-8114	E-mail: Joshua.cope@ttemi.com				
Site Leader: ERIK AF	RMISTEAD	Phone#: 610-364-2	-2151 (	Cell Phone #: 267 44	6 2837	E-mail: Erik.armistead@ttemi.com			
Contractor: Tetra Tecl	h EM Inc	EPA CO/PO: Lorr	rie Murray/	Karen Wodarczyk					
#Samples 30-35 Matrix: soil Parameter: TAL I				ron + Molybdenum +	Hg CHEM	Method: ILM05.4 ICPAES+Hg			
#Samples 20-25	Matrix: groundwater	Parameter: TAL M	Metals + Bo	ron + Molybdenum +		Method: ILM05.4 ICPAES+Hg			
#Samples 90-110	Matrix: potable water	Parameter: TAL m	netals Low(	(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg			
#Samples 90-110	90-110 Matrix: potable water Parameter			, Na	Method: ILM05.4 ICPAES				
#Samples 20-25	Matrix: groundwater	Parameter: TAL m	netals Low(	(w/o Al,Ca,Fe,K,Mg,	Method: ILM05.4 ICPMS & Hg				
#Samples 20-25	Matrix: groundwater	Parameter: Al, Ca,	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 D	ate To: 9/3/2008	Org. Valid	dation Level		Inorg. Validation Level IM2			
Unvalidated Data Requ	uested: 🗌 No 🔀 <b>Ye</b>	s If Yes, TAT Needed:	: 24hrs	☐ 48hrs ☐ 72hrs	☐7days ⊠ Other (	(Specify)14 days			
Validated Data Packag	e Due: 🗌 14 days 🔲	l days 🛛 30days 🔲	42 days	Other (Specify)					
Electronic Data Delive	rables Required: No	Yes (EDDs will be	e provided	in Region 3 EDD For	rmat)				
Special Instructions: Se	Electronic Data Deliverables Required: No 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 CHEMTEC	CH CONSULTING GROUP	Contract: EPW060	47		
Lab Code: CHEM	Case No.: <u>37813</u>	NRAS No.: 1629.0	<u>0</u> S	DG No.: MC02	A1
SOW No.: ILM05.4					
	EPA Sample No.		Lab	Sample ID	
	MC02A1			152-01	
	MC02A2 MC02A3			152-02 152-03	<del>,,,,,,,,,</del>
	MC02A4			152-04	<del></del>
	MC02A5			152-05	-
<b>'</b> ,	MC02A6			152-06 152-07	<del></del>
	MC02A7 MC02A8			152-08	
	MC02A9	*	Z44	152-09	<del>_</del>
	MC02B0			152-10	
	MC02B1 MC02B2			152-11 152-12	
	MC02B3			152-13	
	MC02B4			152-14	<del></del>
	MC02B5 MC02B6			152-15 152-16	
	MC02B7			152-10 152-17	
	MC02B8			<del>152-18</del>	
	MC02L0 MC02B9			152-19 152-21	<del></del>
	MC02B9D			152-21 152-22	
	MC02B9S		Z44	152-23	
	MC02L1			152-24	and the same of th
	MC1GG8 MC1GG9			152-25 152-26	<del></del>
					_
				ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correction	ons applied?	(Yes/No)	YES	
Were ICP-AES and I	CP-MS background correction	ns applied?	(Yes/No)	YES	
	ta generated before ground corrections?	•	(Yes/No)	<u>NO</u>	
Comments:	ground corrections:				
THE "E" QUAL	<u>IFIERS ON FORM I AND VI</u>	II FOR SODIUM IN	IDICATE CH	EMICAL OR PI	HYSICAL
INTERFERENC WHICH WERE	E EFFECTS, SUSPECTED DURING THA	T ELEMENT'S AN	AT VEES ON	I V	
I certify that this data	package is in compliance with	the terms and condi	tions of the co	ntract, both tech	nically and for
	er than the conditions detailed eadable data submitted on disk				
in advance by USEPA	) has been authorized by the I	aboratory Manager	or the Manage	r's designee, as	verified by the
following signature.	(1)				
Signature:	( <del>4)</del>	Name: (b) (4)(b)	(4)		
Date:	alicolo R	Title: (b) (4)(b) (4	4)(b) (4)		
	111010				

COVER PAGE

ILM05.4

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

A. Number of Samples and Date of Receipt

**MODIFIED ANALYSIS: 1629.0** 

- 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: <u>Presence/Absence</u> 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 (AI, 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 1<sup>st</sup> container and use the 2<sup>nd</sup> container as extra volume if needed. Are the laboratory's proposed actions acceptable to the Region?

# 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.

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

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).

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
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.

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

Date 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)
В	50	5.0	250	25 .
Мо	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)(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)

Computer Sciences Corporation (CSC)

(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)

To

Dan Slizys/ESC/R3/USEPA/US@EPA,

09/10/2008 02:08 Carroll

PM

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 |

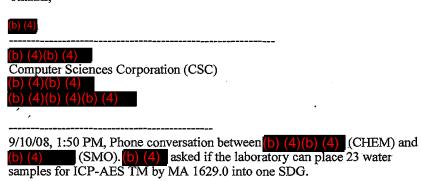
Dan/Carroll,

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,



# INORGANIC / ORGANIC COMPLETE SDG FILE (CSF) INVENTORY CHECKLIST

Case No.: 37	7813	SDG Nos.: MC02	Α1 Ε	ate Rec'd: 9/	17/08	
EPA Lab ID: (	СНЕМ		ORIGINALS	YES	NO	N/A
Lab Location: Region: 3	Mountainside	, NJ	Custody Seals			
Audit No.				$\mathbf{x}$		
Re-submitted CSF? Yes NoX  COMMENTS:  The DC-1 lists incorrect sample tag numbers as follows:		No_X	<ol> <li>Present on package?</li> <li>Intact upon receipt?</li> <li>Form DC-2</li> <li>Numbering scheme accurate?</li> </ol>	X		
				X		
		umbers as follows:		X		
Sample tag no.	sample no.	Correct sample tag no.	4. Are enclosed documents listed?		<del> </del>	
891	MC02A1	777	The state of the s	· X		
892	MC02A2	778	5. Are listed documents enclosed?		-	<del>                                     </del>
893	MC02A3	779	Form DC-1			
894	MC02A4	780		X		
895	MC02A5	781	6. Present?		<del>                                     </del>	<del>                                     </del>
896	MC02A6	782			X	
897	MC02A7	783	7. Complete?			
898	MC02A8	784			X	
899	MC02A9	785	8. Accurate?			
900	MC02B0	786	Chain-of-Custody Record(s) / TR	v		
901	MC02B1	787		X		
902	MC02B2	788	9. Signed?	x		1
903	MC02B3	789				<u> </u>
904	MC02B4	790	10. <u>Dated?</u>			
905	MC02B5	791	Air Bills / Air Bill Sticker			
906	MC02B6	792				
907	MC02B7	793	11. Present?	37		
908	MC02B8	794	Sample Tags	X		
909	MC02B9;	795		•	37	
	MC02B9D;		12. Does DC-1 list tags as being included?		X	<u> </u>
	MC02B9S			1		
	1.1002575		13. Present?			
These sample tag	numbers correspond	d to the dissolved metals	Other Documents			X
aliquots which we the results of whic duplicate entries of	re assigned new sar	nple numbers by SMO and in this data package. The ers 908 and 909 are correctly	ADDITIONAL COMMENTS: Also, the corre permission to place 23 water samples for ICP-AE contains analytical results for 21 total metals and	S TM into one	SDG, bu	ıt this SI

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.

should provide an explanation.

	Audited By:	(b) (4)	Name/Title: (b) (4)(b) (4)(b) (4)(b) (4)	Date: 7/10/08
	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

: Colleen Walling

Region III ESAT RPO

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.

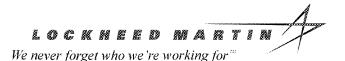
### Attachment

cc: Joshua Cope (TETRA TECH EMI)

TO File #: 0014

TDF#: 0976

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) (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) 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

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED <u>VALUES</u>	<u>BIAS</u>	COMMENTS*
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%)
В	MC02C8	В		High	CCB (17.605 J ug/L)
	MC02D3, MC02D4, MC02D6, MC02D8	В		High	PB (5.965 J ug/L)

<sup>\*</sup> 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 ≤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

Case #: 37813

SDG : (b) (6)

CHEM

Site:

BATTLEFIELD GOLF CLUB

Lab.:

Number of Soil Samples: 0

Number of Water Samples: 20

#### 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 :		8/25/2008		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
ALUMINUM	200	21.5	J	22.7	J						
BORON	50	275		290		295	9	113		116	2000
CALCIUM	5000	65500		62900		66100		67900		26300	
IRON	100	615		12.6	J	631		1190	00000000	180	
MAGNESIUM	5000	42000		43500		44000		18300		12800	
MOLYBDENUM	5				on the second				200	700000	500000
MERCURY	0.2		UL	0.40			UL		UL		UL
POTASSIUM	5000	23200		24400		24900	CERCOSIES.	8760		9450	805000
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 :	ing 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	- 00000
Units:		ug/L		ug/L		ug/L		ug/L		ug/L	2000000
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	garage of the same
Time Sampled :		11:24		11:31		13:28		13:36		14:16	00000
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	В	107		124		54.9	
CALCIUM	5000	26100		15600		39500		41700		71600	80000
IRON	100	175		12900		1980		1760		2830	
MAGNESIUM	5000	12800		6670		19300		19800	0000000	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

Case #: 37813

SDG (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

#### Total Metals

				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 MC02	2D5	Dup. of MC0	2D4		3000
Matrix :		Water		Water		Water		Water		Water	900
Units:		ug/L		ug/L		ug/L		ug/L		ug/L	20000000
Date Sampled :		8/25/2008		8/25/2008		8/25/2008		8/25/2008		8/25/2008	9555000
Time Sampled :		15:15		16:23		19:19		19:19		20:15	300000
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	94.4		16.9	В	29.8	В	30.8	J	18.4	В
CALCIUM	5000	73900		42600		225000		223000		50700	
IRON	100	1420		6600	NO STATE OF THE ST	1660		1560		8060	90000
MAGNESIUM	5000	18000		18400		12700		12700		23200	
MOLYBDENUM	5				SOCIONA			Section 2			
MERCURY	0.2		UL		UL		UL		UL		UL
POTASSIUM	5000	7540		2530	J	4630	J	4500	J	2800	J
SODIUM	5000	64400	J	32600	J	127000	J	125000	J	50300	IJ

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	ogooge
Units:		ug/L		ug/L		ug/L		ug/L		ug/L	900000
Date Sampled :		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008	000000
Time Sampled :		07:46		08:19		09:18		09:16		10:26	popopo
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	200000
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200										
BORON	50	363		26.6	В	284		44.2	J	115	
CALCIUM	5000	32000		37400		29400		64200		29500	
IRON	100	192		644		194		4390		133	
MAGNESIUM	5000	28900		5050		27100		20200		13900	
MOLYBDENUM	5										
MERCURY	0.2		UL		UL		UL		UL		UL
POTASSIUM *	5000	20600		2670	J	19600		4300	J	8710	
SODIUM	5000	340000	J	16600	J.	238000	J	45500	J	65200	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

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF#

37813

-									
Date: 8/21/2008		Site Activity	: Removal Assessme	ent					
Site Name: Battlefield	l Golf Club			Street A	Address: 1001 South Co	enterville Turnpike			
City: Chesapeake		S	State: VA	Latitud	e: 36.68982		Longitude: 76.17790		
Program: Superfund		I	Acct. #: 2008T03 N 30	DODC6C	A3LM RS00	CERCLIS #: VAN0003	306614		
Site ID:		5	Spill ID: A3LM			Operable Unit:			
Site Specific QA Plan	Submitted:	No XYes	Title: Battlefield Go	olf Club I	Fly Ash Assessment SA	ΛP	Date Approved: 8/20/2008		
EPA Project Leader: 0	CHRIS WAGNER	<b>\</b>	Phone#:		Cell Phone #: 804-33	37-3049	E-mail: Wagner.Christine@epa.gov		
Request Preparer: JOS	SHUA COPE		Phone#: 610-364-	2130	Cell Phone #: 215-76	68-8114	E-mail: Joshua.cope@ttemi.com		
Site Leader: ERIK AF	RMISTEAD		Phone#: 610-364-	2151	Cell Phone #: 267 44	16 2837	E-mail: Erik.armistead@ttemi.com		
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lori	rie Murra	y/Karen Wodarczyk				
#Samples 30-35	Matrix: soil		Parameter: TAL N	Aetals + I	Boron + Molybdenum -	+ Hg CHEM	Method: ILM05.4 ICPAES+Hg		
#Samples 20-25	Matrix: ground	water	Parameter: TAL N	/letals + I	Boron + Molybdenum -		Method: ILM05.4 ICPAES+Hg		
#Samples 90-110	Matrix: potable	water	Parameter: TAL n	netals Lo	w(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, N	Лg, Na		Method: ILM05.4 ICPAES		
#Samples 20-25	Matrix: ground	water	Parameter: TAL n	netals Lo	w(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg		
#Samples 20-25	Matrix: ground	water	Parameter: Al, Ca	, Fe, K, N	Иg, 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. Va	alidation Level		Inorg. Validation Level IM2		
Unvalidated Data Requ	uested: No	⊠ Yes	If Yes, TAT Needed:	24hr	rs 48hrs 72hrs	s □7days ⊠ Other (	(Specify)14 days		
Validated Data Packag	ge Due: 🔲 14 da	ys <u>21</u> 0	lays 🛛 30days 🔲	42 days	Other (Specify)				
Electronic Data Deliverables Required: No X Yes (EDDs will be provided in Region 3 EDD Format)									
Special Instructions: S	ee attached DLs.								
		`							

#### **USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record**

Case No:	<del>37814</del> 37813	R
DAS No:	, E	8 4

Region:	3			Date Shipped:	9/2/2008		Chai	n of Custody F	ecord		Sampler	E:/	10- de D
Project Code:	CT4354			Carrier Name:	FedEx						Signature:		humos
Account Code:				Airbill:	96194297	7974,	Relin	quished By	(Date /	Time)	Received By	·	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:		n Consulting	1						
Spill ID: Site Name/State:	ALM				Group (Ch 284 Sheffi	,	2.						
Project Leader:	Battlefield					ide NJ 07092		***************************************					
Action:	Erik Armiste Preliminary		ent		(908) 789-	8900	3.						
Sampling Co:	Tetra Tech		J				4.						
INORGANIC	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG PRESERVA		STATION LOCATION			COLLECT		I GANIC		QC
SAMPLE No.	JAMIFLER	1111	TOMMANOUND	FRESERVA	IVE/ DOMES	LOCATION	eine en	DAI	CTINIC	SAMI	PLE No.		Туре
MC02B2 MC16-6-2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 9 (2)	02 (HNO3)	BG08-GW-MP	12	S: 8/28/2008	13:05	٠.	./	weil '	= 117100 0600 = 410.024
MC02B3 AC16-6-3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 96 (2)	03 (HNO3)	BG08-GW-MP	13	S: 8/28/2008	13:25				_ when 24
MC02B4 NC16-6-∜	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 9(2)	04 (HNO3)	BG08-GW-MW	/01	S: 8/29/2008	15:55	- 13 <b>3</b>		rece	d application
MC02B5	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	<b>791</b> (HNO3), 9(2)	05 (HNO3)	BG08-GW-MW	/02	S: 8/29/2008	13:50				MCCJC1 ICP-AES
MC02B6 こ\()・6~6	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 9 (2)	06 (HNO3)	BG08-GW-MW	02D	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), 9 (2)	07 (HNO3)	BG08-GW-MW	/03	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), 90 (2)	08 (HNO3)	BG08-SW-SW	'01	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), 90 (2)	)9 (HNO3)	BG08-SW-SW	02	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	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:	oplantin and a member of a representation of the literature plantin.	Additional S	ampler Signature(s):				-	Chain of Custo	ody Seal Nu	ımber:
Analysis Key:	Concentr	ation:	L = Low, M = Low/Medium, F	1 = High	Type/Desig	nate: Composite = C,	Grab =	G			Shipment Iced	1?	
TAL DM+B+M =	TAL Diss Metals	-Boron+M	oly, TAL Met+B+ = TA	L Metals + Boro	n + Molybder	num, TAL TM+B+M =	TAL T	otal Metals+Boro	n+Moly				

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

### SEPA USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

37814 37813 Case No: DAS No:

Region: Project Code:	3 CT4 <b>354</b>			Date Shipped: Carrier Name:	9/2/2008 FedEx		Chain of Custod	y Record	S	ampler ignature:	(Chistre
Account Code:	C14354			Airbill:	961942977974,		Relinquished By	` (Date /	Time) Re	eceived By	(Date / Time)
CERCLIS ID: Spill ID:	VAN0003066 ALM	314		Shipped to:	ChemTech Consulting Group (CHEMED)		2.			177	
Site Name/State:	Battlefield G	olf/VA			284 Sheffield St Mountainside N		2.				
Project Leader:	Erik Armiste		ant.		(908) 789-8900	3 07032	3.				
Action: Sampling Co:	Preliminary . Tetra Tech I		31 II				4.				
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG N PRESERVATIV		STATION LOCATION		PLE COLLECT DATE/TIME	ORGAI SAMPLE		QC Type
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	799 (HNO3) (1)		(b) (6)(b) (6)	S: 8/26/200	8 16:45			. John J. J.
· ( · )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	801 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 10:43		,	ued apricedo
- / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	802 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 10:40			
, (-)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	803 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 11:24			
- / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	804 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 11:31			
· ( · )	Potable Well/ Erik Armistead	M/G :	TAL TM+B+M (14)	805 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 13:28			
/ ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	806 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 13:36			
, ( · )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	807 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 14:16			
, ( - )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	808 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 15:15			
7 ( - )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	809 (HNO3) (1)		(b) (6)(b) (6)	S: 8/25/200	8 16:23			
/ ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	810 (HNO3) (1)	,	(b) (6)(b) (6)	S: 8/25/200	8 19:19			
Shipment for Case Complete? Y	Sample(s)	to be used	for laboratory QC:	uitenstantanussia santat Specedatis	Additional Sample	r Signature(s):			Cha	in of Custody Se	al Number:
Analysis Key:	Concentra	tion: 1	_ = Low, M = Low/Medium, H	I = High	Type/Designate:	Composite = C,	Grab = G		Shir	pment Iced?	

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs. TR Number:

	2000	P	Δ
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### USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

37814 37813 Case No: DAS No:

Region: Project Code:	3			Date Shipped:	9/2/2008		Chain	of Custody R	ecord		ampler ignature:	[ids	Shirted
Account Code:	CT4354			Carrier Name: Airbill:	FedEx 961942977974,		Relinqui	hed By	(Date / Tim	e) R	eceived By	Viv. C	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	ChemTech Cons	ultina	1	·					
Spill ID:	ALM			eccentral and a second	Group (CHEMED	0)	2.						
Site Name/State:	Battlefield G				284 Sheffield Str Mountainside NJ		Ľ.		······································				····
Project Leader: Action:	Erik Armiste Breliminary		ant		(908) 789-8900		3.						
Sampling Co:	Tetra Tech		, , , , , , , , , , , , , , , , , , ,	·			4.						
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG N PRESERVATI		STATION LOCATION			COLLECT E/TIME	ORGA SAMPLI			QC Type
	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	811 (HNO3) (1)		(b) (6)(b) (6)	S	: 8/25/2008	19:19			000	- 1 = 1.2 l S
-, -, -,	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	812 (HNO3) (1)		(b) (6)(b) (6)	S	8/25/2008	20:15				/ «/17/w
	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	<b>813</b> (HNO3) (1)		(b) (6)(b) (6)	S S	: 8/26/2008	7:46				
	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	<b>814</b> (HNO3) (1)		(b) (6)(b) (6)	S S	: 8/26/2008	8:19				•
-, (-,	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	815 (HNO3) (1)		(b) (6)(b) (6)	S	8/26/2008	9:18				-
- / - /	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	816 (HNO3) (1)		(b) (6)(b) (6)	S	: 8/26/2008	9:15	,			-
	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	817 (HNO3) (1)		(b) (6)(b) (6)	S	8/26/2008	10:26				
- / ( - /	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	818 (HNO3) (1)		(b) (6)(b) (6)	S	8/26/2008	10:50			<b></b>	-
	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	819 (HNO3) (1)		(b) (6)(b) (6)	S	: 8/26/2008	11:33				-
-, (-,	otable Well/ rik Armistead	M/G	TAL TM+B+M (14)	820 (HNO3) (1)		(b) (6)(b) (6)	S	8/26/2008	11:26				-
- / ( - /	otabie Well/ rik 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 t	for laboratory QC:		Additional Sampler	Signature(s):				Cha	in of Custoc	ly Seal Num	nber:
Analysis Key:	Concentr	ation: L	. = Low, M = Low/Medium, H	H = High	Type/Designate:	Composite = C,	Grab = G			Shi	pment Iced?		

TR Number: 3-375524367-090108-0001

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

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

Appendix D

Laboratory Case Narrative

#### USEPA - CLP

#### **COVER PAGE**

Lab Name CHEMTEC	CH CONSULTING GROUP	Contract: EPW0604	<u>17</u>		
Lab Code: <u>CHEM</u>	Case No.: <u>37813</u>	NRAS No.: <u>1629.0</u>	SD	3 No.: MC02	C1
SOW No.: <u>ILM05.4</u>					
	EPA Sample No.		Lab Sa	mple ID	
	MC02C1		Z4398	R-01	
	MC02C2		Z4398		<del></del>
	MC02C3		Z439		
	MC02C5		Z4398		<del></del>
	MC02C6	~	Z439		···
,	MC02C7		Z439	3-06	<del></del>
	MC02C8		Z4398	3-07	
	MC02C9	*	Z4398	3-08	
	MC02D0		Z4398	3-09	
•	MC02D1		Z4398	3-10	
	MC02D2		Z439	3-11	
	MC02D3		_Z4398		-
	MC02D4		Z4398		
	MC02D5		Z4398		
	MC02D6		Z4398		
	MC02D7 MC02D8		Z4398		···
	MC02D8 MC02D9		Z4398 Z4398		
	MC02E0		Z4398		
	MC02E0 MC02E1		Z4398		<del></del>
	MC02E1D		Z4398		<del>_</del>
	MC02E1S		Z4398		
					·
				ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correctio	ns applied?	(Yes/No)	YES	<del>_</del>
	CP-MS background correction	s applied?	(Yes/No)	YES	
If yes, were raw dat application of backs			(Yes/No)	NO	
Comments:					
		The state of the s			
			····		·
completeness, for other and in the computer-re- in advance by USEPA)	package is in compliance with r than the conditions detailed a adable data submitted on diske has been authorized by the L	bove. Release of the ette (or via an alterna	e data contained te means of elec	in this harded tronic transm	py data package ission, if approved
following signature.		•	-		
Signature:	<b>(4)</b>	Name: (b) (4)(b) (4	ł)		
Date:	9116/08	Title: (b) (4)(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: <u>Presence</u>/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	(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)
В	50	5.0	250	25
Мо	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.

Lahoratory Name			
Laharatary Name			
	Laboratory Name:	 	 

#### 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.

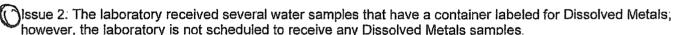
Matrix Ground Water <u>Analysis</u>

Ground Water Surface Water

ICP-AES TM+B+Mo by MA 1629.0 and Hg 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.

Matrix

Analysis (filtered)

Ground Water Surface Water ICP-AES (Al, Ca, Fe, Mg, K, Na)+B+Mo by MA 1629 0, Hg, and ICP-MS Metals

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

MC1GF5
MC1GF6
MC1GF7
MC1GF8
MC1GF9
MC1GG0
MC1GG1
MC1GG2
MC1GG3
MC1GG4
MC1GG5
MC1GG6
MC1GG7
MC1GG8
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 1<sup>st</sup> container and use the 2<sup>nd</sup> 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)

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 (AI, 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

Region III ESAT RPO (3EA20)

TO

: Christine Wagner

Regional Project Manager (3HS32)

inorganic data validation report is the Battlefield Colf 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



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) (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, ± 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

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

<sup>\*</sup> 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)

Case #: 37813

SDG : (b) (6)

Site: BATTLEFIELD GOLF CLUB

Number of Soil Samples: 0 Number of Water Samples: 20

Lab.: CHEM

Sample Number :		(b) (6)	CHIEF CHIEF	(b) (6)	шкаат	(b) (6)	ere en	(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 :			0,000,000		_	(b) (6)(b) (6)		(b) (6)(b) (6) (b) (6)(b) (6)			_
Matrix :		Water	Vater W			Water		Water		Water	900000
Units :		ug/L				ug/L		ug/L		ug/L	
Date Sampled :		8/26/2008	· '			8/26/2008		8/26/2008		8/26/2008	
Time Sampled :				11:33		11:26		11:26		13:16	
Dilution Factor :		1.0		1.0 1.0		1.0		1.0		1.0	
ANALYTE	CRQL	Result	Flag	Result	sult Flag Result Flag		Flag	g 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	1	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)	AND DESCRIPTION OF THE PERSON	(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)					500000000
Matrix:		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	Sologo
Date Sampled :		8/26/2008		8/26/2008		8/26/2008		8/26/2008		8/26/2008	2000
Time Sampled :		17:18		17:50		17:50		18:51		18:59	
Dilution Factor :		1.0		1.0 1		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										00000
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

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

SEE NARRATIVE FOR CODE DEFINITIONS

Revised 09/99

Case #: 37813 SDG (b) (6)

Site: BATTLEFIELD GOLF CLUB

Lab.: CHEM

Sample Number :		(b) (6)	**********	(b) (6)	-	(b) (6)	CEPTOTO PER	(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	3)
Field QC:					_					·	_
Matrix:		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L	İ	ug/L		ug/L	
Date Sampled :		8 - 8		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	100	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 :	Sample Number :		Section of the least	(b) (6)	<b>STANCKER KREE</b>	(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	<u>)</u>	
Field QC :					_							
Matrix :		Water V		Water		Water		Water		Water		
Units :				ug/L		ug/L		ug/L		ug/L	SOCIETA	
Date Sampled :		8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008	CONTRACT.	
Time Sampled :		11:24		11:56		12:24		13:18		13:39	900000	
Dilution Factor :		1.0		1.0 1.0 1.0		1.0						
ANALYTE	CRQL	Result	Flag	Result	Flag	g 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									2.00		
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** 



## USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

37814 37813 (g) Case No: DAS No:

Region: Project Code:	3			Date Shipped: Carrier Name: Airbill: Shipped to:	9/2/2008 FedEx 961942977974, ChemTech Consulting Group (CHEMED)		Chain of Custody Record				Sampler Signature:	Chuthal
CT4354			Relinquished By (Date / Tir				ne)	Received By	(Date / Time)			
CERCLIS ID:	V/4100000014		1									
Spill ID:			2.					***************************************				
Site Name/State:	Battlefield	Golf/VA		2000 Carlos Carl	284 Sheffield Street Mountainside NJ 07092		۷.					
Project Leader: Erik Armistead			in the second	(908) 789-8								
Action:	Breliminary Assessment					4.						
Sampling Co:	Tetra Tecr	Tetra Tech EM Inc.					<u> </u>		( intermediate property of the second comp	ettermenteriorische State		
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION			E/TIME		GANIC PLE 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	Sample(s) to be used for laboratory QC:			Additional Sampler Signature(s):							Chain of Custody Seal Number:	
Complete? Y	- Campion	Sumple(s) to be used for laboratory do.									,	
Analysis Key:	Concent	ration:	L = Low, M = Low/Medium, F	l = High	Type/Design	ate: Composite = C.	Grab =	3		·	Shipment Iced?	
TAL DM+B+M =	TAL Diss Metals	+Boron+M	ioly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenu	ım, TAL TM+B+M =	TAL TO	otal Metals+Boro	n+Moly			

TR Number:

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

S	P	

### USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

<del>3781</del>437913 Case No: DAS No:

Region: Project Code:	3			il .	9/2/2008 FedEx 961942977974, ChemTech Consulting Group (CHEMED)		Chain of Custody Record				Sampler Signature:	
Account Code:	CT4354		Carrier Name: Airbill:	Relinqu			Relinquished By (Date / Time)		e)	Received By	(Date / Time)	
CERCLIS ID:	VAN000306614		Shipped to:	1			······································					
Spill ID:	ALM			<u> </u>								
Site Name/State:	ate: Battlefield Golf/VA		284 Sheffield Street Mountainside NJ 07092			2.						
Project Leader:	Erik Armistead			(908) 789-8900		3.						
Action:	Preliminary Assessment					4.				P		
Sampling Co:	Tetra Tech E	Tetra Tech EM Inc.										
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND			STATION LOCATION	_			GANIC PLE 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)	<b>.</b>	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			2-
(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/G1	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 /			
	Potable Well/ Erik Armistead	M/G	TÁL TM+B+M (14)	829 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	9:18 /			
/ ( - /	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			
/ ( - /	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:	
												STATE OF THE PROPERTY OF THE P
Analysis Key:	alysis 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)

WEFA			P	A
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# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

<del>\$7814</del>-3788 Case No: DAS No:

Region: Project Code:	3			Date Shipped: Carrier Name:	9/2/2008 FedEx		Chai	n of Custody R	ecord		Sampler Signature:	li (Tinched
Account Code:	CT4354			Airbill:	961942977974,		Relino	luished By	♥ (Date / Tim	ne)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	ChemTech Cons	sultina	1					
Spill ID:	ALM				Group (CHEMEI	D)	2.					······································
Site Name/State:	Battlefield C			74	284 Sheffield Sta Mountainside No							
Project Leader: Action:	Erik Armiste Preliminary		ant		(908) 789-8900		3.					
Sampling Co:	Tetra Tech						4.					***************************************
			ANALYCIC/	TAGI	de /	STATION		CAMPLE	COLLECT	^ D	L	QC
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	PRESERVATI		LOCATION .			E/TIME		GANIC PLE No.	Туре
/ ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	833 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	11:24 /			27 -70
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	834 (HNO3) (1)		(b) (6)(b) (6)	ı	S: 8/27/2008	11:56			
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	835 (HNO3) (1)		(b) (6)(b) (6)	J	S: 8/27/2008	12:24 /			
/ ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	836 (HNO3) (1)	e.	(b) (6)(b) (6)		S: 8/27/2008	13:18 /			
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	837 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/27/2008	13:39 /			<del></del>
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	838 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/27/2008	14:21			<del></del>
, , ,	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	839 (HNO3) (1)		(b) (6)(b) (6)	ı	S: 8/27/2008	14:58			
- / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	840 (HNO3) (1)		(b) (6)(b) (6)	J	S: 8/26/2008	13:20			
- / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	841 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	15:20			
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	842 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	16:39			
- / ( - /	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 Sea	il Number: ·
Analysis Key:	Concentra	ation: L	= Low, M = Low/Medium, H	= High	Type/Designate:	Composite = C,	Grab = (	G	Market 1974		Shipment Iced?	
	TAL Diss Metals		oly, TAL Met+B+ = TA	•	+ Molybdenum, I				n+Moly	L	·	

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

## U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF#

37813

Date: 8/21/2008	Site Ac	tivity: Removal Assessme	ent			
Site Name: Battlefield	Golf Club		Street 4	Address: 1001 South C	enterville Turnpike	
City: Chesapeake		State: VA	Latitud	le: 36.68982		Longitude: 76.17790
Program: Superfund		Acct. #: 2008T03 N 30	D2DC6C	A3LM RS00	CERCLIS #: VAN000	306614
Site ID:		Spill ID: A3LM			Operable Unit:	
Site Specific QA Plan	Submitted: No	Yes Title: Battlefield Go	olf Club	Fly Ash Assessment SA	VP.	Date Approved: 8/20/2008
EPA Project Leader:	CHRIS WAGNER	Phone#:		Cell Phone #: 804-33	37-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOS	SHUA COPE	Phone#: 610-364-	2130	Cell Phone #: 215-76	68-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK AI	RMISTEAD	Phone#: 610-364-	2151	Cell Phone #: 267 44	46 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tec	h EM Inc	EPA CO/PO: Lor	rie Murra	ay/Karen Wodarczyk		
#Samples 30-35	Matrix: soil	Parameter: TAL N	Metals +	Boron + Molybdenum	Method: ILM05.4 ICPAES+Hg	
#Samples 20-25	Matrix: groundwater	Parameter: TAL N	Metals + 1	Boron + Molybdenum -	Method: ILM05.4 ICPAES+Hg	
#Samples 90-110	Matrix: potable water	Parameter: TAL n	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	Parameter: Al, Ca, Fe, K, Mg, Na			Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL n	netals Lo	w(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, N	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. Va	alidation Level		Inorg. Validation Level IM2
Unvalidated Data Requ	uested: 🗌 No 🔀 Y	es If Yes, TAT Needed:	24hi	rs 🗌 48hrs 🔲 72hrs	s 🔲 7 days 🔀 Other	(Specify)14 days
Validated Data Packag	e Due: 🗌 14 days 📗	]21 days 🛛 <b>30days</b> 🔲	42 days	Other (Specify)		
Electronic Data Delive	rables Required: 🔲 No	Yes (EDDs will b	e provide	ed in Region 3 EDD Fo	rmat)	
Special Instructions: S	ee attached DLs.					
		•				

## Appendix D

**Laboratory Case Narrative** 

## USEPA - CLP

## COVER PAGE

Lab Name CHEMTEC	CH CONSULTING GROUP	Contract: EPW0604	7		
Lab Code: <u>CHEM</u>	Case No.: <u>37813</u>	NRAS No.: <u>1629.0</u>	SDG	No.: MC021	Ξ2
SOW No.: ILM05.4					
	EPA Sample No.		Lab San	nple ID	
	MC02E2		Z4399	-01	_
	MC02E3		Z4399		_
	MC02E4		Z4399		
	MC02E5 MC02E6		Z4399 Z4399		<del></del>
, ,	MC02E7		Z4399		*********
	MC02E8		Z4399		<del></del>
	MC02E9	*	Z4399	-08	
	MC02F0		Z4399		<u>_</u>
	MC02F1		Z4399		
	MC02F2 MC02F3		Z4399 Z4399		Address .
	MC02F4		Z4399		
	MC02F5		Z4399		
	MC02F6		Z4399		
	MC02F7		Z4399		
	MC02F8		Z4399		
	MC02F9 MC02G0		Z4399 Z4399		
	MC02G1		Z4399		<del></del>
	MC02G1D		Z4399		
	MC02G1S		Z4399	-22	Sandricks
	•			ICP-AES	ICP-MS
	ICP-MS interelement correction	• •	(Yes/No)	YES	
	CP-MS background correction	ns applied?	(Yes/No)	YES	
	ta generated before ground corrections?		(Yes/No)	<u>NO</u>	
Comments: THE "E" QUAL	IFIERS ON FORM I AND VI	II FOR SODIUM IND	DICATE CHEM	IICAL OR PH	IYSICAL
INTERFERENC					
WHICH WERE	SUSPECTED DURING THA	<u>T ELEMENT'S ANA</u>	LYSES ONLY	•	
completeness, for other and in the computer-re in advance by USEPA	package is in compliance with or than the conditions detailed cadable data submitted on disk ) has been authorized by the L	above. Release of the ette (or via an alternat	data contained e means of elec	in this hardeo tronic transm	py data package ission, if approved
following signature.		,			
Signature:		Name: (b) (4)(b) (4	4)		
Date:	T16/0A	Title: (b) (4)(b)	(4)		
•	<b>.</b> /				

## 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: <u>Presence</u>/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 Name: (b) (4)(b) (4)

Date 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)
В	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 CROLs.

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 M	Iodified Analysis:	
Laboratory Name:		
Laboratory Comments:		

## **Contractor Laboratory Acknowledgment Document**

		11.	Dankaria	000	(A)	Cost For Mo	dified Analysis
Analysis	Modification Reference Number	Hardćopy Turnaround Requirement	Preliminary Results (Y/N)	PDF Delivery (Y/N)	Estimated No. of Samples by Matrix (including billable QC)	(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	\$

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

Pro	ioct	Info	rmat	lion
riu	neci	HIII	midi	IVII

Estimated Shipping Period:

8/29/2008 through 9/3/2008

Additional Information:

Please note that the samples will ship under two Cases.

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 inLaboratory DECLINES to perform analysis through the modified analysis protocol outlined	n Modified Analysis Request. 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.

Received By (Print Nan	(b) (4) (b)			entrological (III control to the entrological policy (III control entrological entrological entrological entrol		Log-in Date 9/3/2008
Received By (Signature	(D) (4)		SERVICE CONTRACTOR CON	rrecense and control of the server of the control of the server of the s	aannings on experie did kan yn monannan	
Case Number 37813	The same of the sa	Sample Deli	very Grou	p No. MC02E2	NRAS Nu	nber
Remarks:				Corres	ponding	
Custody Seal(s)						Remarks Conditior
2. Custody Seal  Nos.  3. Traffie  Pres	ert/Absent*	EPA Sample #	Aqueous Sample pH	Sample Tag #	Assigned Lab #	of Sample shipment etc.
Reports/Chain Of Custody Reports or		MC02E2	NA	818	Z4399-01	intact
Packing Lists		MC02E3		· &260 819	Z4399-02	
4. Airbill Airb	⊮/Sticker	MC02E4		. 820	Z4399-03	
	ent/Absent*	MC02E5		· 834 @ 831	Z4399-04	
5. Airbill No.	6(942977974	MC02E6		. 899	Z4399-05	
6. Sample Tags Pres	ert/Absent*	MC02E7		. 833	Z4399-06	
Sample Tag #	Not Listed FR/Chain-of-Custody	MC02E8		. 824	Z4399-07	
	et/Broken*/Leaking	MC02E9		. ৪৯১	Z4399-08	
· · · · · · · · · · · · · · · · · · ·	ent/Absent*	MC02F0		. 896	Z4399-09	
Temperature	eng Absent	MC02F1		. 827	Z4399-10	
Indicator Bottle		MC02F2		. 828	Z4399-11	
9. Cooler Temperature	400	MC02F3		. 839	Z4399-12	
10. Does information	'No*	MC02F4		. 830	Z4399-13	
on custody records, traffic		MC02F5		. 831	Z4399-14	
reports, and		MC02F6		. 832	Z4399-15	
sample tags aggree?		MC02F7		. 833	Z4399-16	
11. Date Received at	9. 308	MC02F8		. 834	Z4399-17	
Lab	9:30	MC02F9	1	. 835	Z4399-18	
12. Time Received	7.30	MC02G0	1	. 836	Z4399-19	
Sample T	ransfer	MC02G1		. 837	Z4399-20	
Fraction METALS F	raction	MC02G1D	<b> </b>	837	Z4399-21	
	Area # (C)	MC02G1S		. 837	Z4399-22	V
The same of the sa	Зу					
	On					1
* Contact SMO and atta	ach record of resolut	ion		(b) (	4)	
Reviewed By (b) (4) Date 9.16.0	3	CONTRACTOR OF THE REAL PROPERTY AND THE CONTRACTOR OF THE CONTRACT	.ogbook N .ogbook Pa	0.	Service and the service and th	
and the second s			and the same of th			

FORM DC-1

ILM05.3





### 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

TO

: Christine Wagner

Regional Project Manager (3HS32)

Attached is the inorganic data validation report for Battlefield (colf 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



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: MC02E3

Site: Battlefield Golf Club

FROM:

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

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) 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 ( $\leq X$ ) the blank concentrations may be biased high and have been qualified "B" on the DSFs.

Blank Affected Analytes

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 (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.

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, ±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

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

<sup>\*</sup> See explanation of comments in Table 1B

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

Case 37813, SDG MC02E3

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED <u>VALUES</u>	BIAS	COMMENTS*
Co	MC02E2, MC02E3, MC02E4, MC02E5, MC02E7, MC02E9, MC02F3	В		High	PB (0.200 J μg/L)
Pb	MC02E2	В		High	CCB (0.110 J µg/L)
	MC02F0, MC02F2, MC02F3	В		High	CCB (0.123 J µg/L)
Ni	MC02E2, MC02E4, MC02E6, MC02E8, MC02E9, MC02F0, MC02F1, MC02F2, MC02F3, MC02F6, MC02G1	В		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	В		High	CCB (0.090 J μg/L) MSL (48%)

<sup>\*</sup> See explanation of comments in Table 1B

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

Case 37813, SDG MC02E3

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED VALUES	BIAS	COMMENTS*
Ag	MC02E9, MC02F0, MC02F1, MC02F8, MC02F9	В		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	В		High	PB (0.243 J μg/L)

<sup>\*</sup> 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

Number of Soil Samples: 0

Number of Water Samples: 20

Case #: 37813

Site:

Lab.:

SDG: (b) (6)

**BATTLEFIELD GOLF CLUB** 

CHEM

Sample Number :		(b) (6)		(b) (6)		(b) (6)		(b) (6)	***************************************	(b) (6)	REFERENCESE
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	-4-22-2-3	1.0	STATE OF THE STATE
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	0.37	В	0.99	В	0.21	В				
*ARSENIC	1	1.4	В	1.3	В	1.4	В	1.6		1.5	В
BARIUM	10	1.7	В	11.4		1.5	В	1.3	В	10.2	
BERYLLIUM	1	property and the second		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	В	0.21	В	0.14	В	0.11	В		
COPPER	2	2.6		246		8.4		63.3		24.4	
*LEAD	1	0.22	В	6.2		0.77	J	6.1		4.5	
MANGANESE	1	5.5		231		3.6		4.3		152	
*NICKEL	1	0.74	В	1.2		0.63	В	1.2		0.58	В
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1	0.063	В	0.083	В	0.040	В	0.037	В		UL
THALLIUM	1			0.11	J						
VANADIUM	5	1.2	В	1.1	В	1.0	В	1.3	J	0.88	В
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)

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 <mark>(b) (6)</mark>		Dup of (b) (6)					
Matrix :	Matrix :				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	200000
Time Sampled :		17:18		17:50		17:50		18:51		18:59	
Dilution Factor :		1.0		1.0		1.0		1.0	<b>2010-200</b>	1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2					0.21	В				
*ARSENIC	1	1.7		1.4	В	1.3	В	1.3	В	1.4	В
BARIUM	10	1.8	В	1.2	В	1.6	В	1.6	В	1.8	В
BERYLLIUM	1			4							
*CADMIUM	1					0.11	В	0.15	В	0.11	В
*CHROMIUM	2	1.1	J	0.71	J	0.74	В	0.76	В	0.76	В
COBALT	1	0.17	В			0.13	В				
COPPER	2	123		32.6		21,6		1.2	J -	11.0	
*LEAD	1	18.6		1.9		1.4		0.12	В	0.77	j
MANGANESE	1	4.3		6.6		6.7		7.6		8.5	
*NICKEL	1	1.3		0.63	В	0.65	В	0.45	В	0.51	В
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL		UL	0.10	В	0.037	В	0.040	В
THALLIUM	- 1										
VANADIUM	5	1.5	J	0.69	В	1.2	В	0.71	В	0.78	В
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)

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 :	Matrix :			Water		Water		Water		Water	
Units:	Inits:			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	ercerentrikon.	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	В	1.5	В	1.5	В
BARIUM	10	4.0	В	29.4		6.7	J	5.6	В	5.4	В
BERYLLIUM	1										
*CADMIUM	1									0.12	В
*CHROMIUM	2	0.96	J	0.88	В	0.83	В	0.87	В	0.79	В
COBALT	1			0.11	В						
COPPER	2	2.4		1.3	J	129	à	58.5		37.5	
*LEAD	1	0.21	В	0.20	В	7.1	,	4.6		12.0	
MANGANESE	1	5.0		200		44.6		47.2		46.6	
*NICKEL	1	0.47	В	0.55	В	1.5		1.1		0.85	В
SELENIUM	5	3.6	J		UL		UL		UL	100	UL
SILVER	1		UL		UL		UL		UL		UL
THALLIUM	1										
VANADIUM	5	0.56	В	0.86	В	0.60	В	1.6	J	0.95	В
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)

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:	Inits :			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	postovene pre	1.0	gerranen en	1.0	
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2			0.23	В						
*ARSENIC	- 1	1.6		1.5		1.6		1.4	В	1.7	
BARIUM	10	44.1		22.2		14.2		3.0	В	1.9	В
BERYLLIUM	1										
*CADMIUM	1	0.13	В	0.16	В	0.10	В				
*CHROMIUM	2	1.5	J	0.99	J	1.1	J	0.93	J	0.83	В
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	В
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	1		UL	0.097	В	0.063	В		UL		UL
THALLIUM	1			17.00 18.00							
VANADIUM	5	1.7	J	1.1	В	1.0	В	1.2	В	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)

# Appendix C

Chain-of-Custody Records

ar d	Separate Sep	1	A
	Same:	Base 19	
4	Service .		

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

37814 37813 Case No: DAS No:

Region: Project Code:	3 CT43	054		n na	Date Shipped:	9/2/2008 FedEx		Chain	of Custody R	ecord		Sampler Signature:	antid
Account Code:	. CT43	004			Airbill:	961942977974,		Relinqu	ished By	(Date / T	ime)	Received By	(Date / Time)
CERCLIS ID:	VANO	000306614			Shipped to:	ChemTech Cons	sultina	1					
Spill ID:	ALM					Group (CHEMED	D)	2.					
Site Name/State:	Battle	efield Golf/\	/A			284 Sheffield Str Mountainside NJ		۷.					
Project Leader:		Armistead				(908) 789-8900	07092	3.					
Action:		minary Ass		ent		, ,		4.					
Sampling Co:	l etra	Tech EM I	ΠC.					_					
INORGANIC SAMPLE No.	MAT SAME		ONC/ YPE	ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	QC Type
(b) (6)	Potable W Erik Armis		l/G	TAL TM+B+M (14)	811 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	19:19			
(b) (6)	Potable W Erik Armis		I/G	TAL TM+B+M (14)	812 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	20:15			
(b) (6)	Potable W Erik Armis		l/G	TAL TM+B+M (14)	813 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	7:46			
(b) (6)	Potable W Erik Armis		l/G	TAL TM+B+M (14)	814 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	8:19			
(b) (6)	Potable W Erik Armis		I/G	TAL TM+B+M (14)	815 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/26/2008	9:18			
(b) (6)	Potable W Erik Armis		l/G <sup>*</sup>	TAL TM+B+M (14)	816 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	9:15			
(b) (6)	Potable W Erik Armist		l/G	TAL TM+B+M (14)	817 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	10:26			
(b) (6)	Potable W Erik Armis		l/G	TÁL TM+B+M (14)	818 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	10:50			
(b) (6)	Potable W Erik Armis		I/G	TAL TM+B+M (14)	819 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/26/2008	11:33			
(b) (6)	Potable W Erik Armis		7G	TAL TM+B+M (14)	820 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	11:26			
(b) (6)	Potable W Erik Armis		I/G	TAL TM+B+M (14)	821 (HNO3) (1)	•	(b) (6)(b) (6)		S: 8/26/2008	11:26			
Shipment for Case Complete? Y	Sa	ample(s) to be	e used f	or laboratory QC:	addilateid (dissiproise) ac in patrici (dissiproise)	Additional Sampler	Signature(s):					Chain of Custody Seal	Number:
Analysis Key:	С	oncentration	L	= Low, M = Low/Medium, H	= High	Type/Designate:	Composite = C,	Grab = G	······································	······································		Shipment Iced?	
TAL DM+B+M =	TAL Diss N	Metals+Bor	on+Mo	oly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum, T	AL TM+B+M =	TAL Tot	al Metals+Boro	n+Moly			

TR Number: TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

L	P	Д

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

3781432P13 Case No: DAS No:

Region: Project Code:	3			Date Shipped:	9/2/2008		Chain d	of Custody F	Record		Sampler Signature:	Think S
Account Code:	CT4354			Carrier Name: Airbill:	FedEx 961942977974,		Relinquis	hed By	(Date / Ti	ne)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	ChemTech Con	sultina	1					
Spill ID:	ALM				Group (CHEME	D)	2.					
Site Name/State:	Battlefield 0	Golf/VA			284 Sheffield St Mountainside N		۷.		· · · · · · · · · · · · · · · · · · ·			
Project Leader:	Erik Armiste				(908) 789-8900		3.					
Action:	Preliminary		ent	NA 1000			4.					
Sampling Co:	Tetra Tech	EM Inc.								enement and a		
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION			E COLLECT 'E/TIME		GANIC PLE 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	50000		44 Au
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	823 (HNO3) (1)		(b) (6)(b) (6)	ß 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 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 Sample	r Signature(s):					Chain of Custody Seal	Number:
Analysis Key:	Concentr	ation:	L = Low, M = Low/Medium, F	l = High	Type/Designate:	Composite = C,	Grab = G		11		Shipment Iced?	
TAL DM+B+M =	TAL Diss Metals	+Boron+N	loly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum,	TAL TM+B+M =	TAL Tota	l Metals+Boro	on+Moly	I		

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

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

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# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 37814-3783

Region: Project Code:	3			Date Shipped:	9/2/2008		Chain of Custody	Record		Sampler Signature:	(dinha)
Account Code:	CT43	354		Carrier Name: Airbill:	FedEx 961942977974		Relinquished By	(Date / T	ime)	Received By	(Date / Time)
CERCLIS ID:	VANO	000306614		Shipped to:	ChemTech Co.		1				
Spill ID:	ALM			Simpped to.	Group (CHEME	ED)	2.				
Site Name/State:	: Battli	efield Golf/VA	· ·	THE PERSON NAMED IN COLUMN TO THE PE	284 Sheffield S Mountainside N		2.				
Project Leader:		Armistead		NOTE OF THE PROPERTY OF THE PR	(908) 789-8900		3.				
Action: Sampling Co:		minary Asses a Tech EM Ind		Abstraction			4.				
						OTATION	CAMP	= 0011 FOT			
INORGANIC SAMPLE No.		TRIX/ CON PLER TYP		TAG PRESERVAT		STATION LOCATION		E COLLECT TE/TIME		GANIC PLE No.	QC Type
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	833 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	11:24			
(b) (6)	Potable W Erik Armis		. TAL TM+B+M (14)	834 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	11:56			
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	835 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	12:24			
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	836 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	13:18			
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	837 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	13:39			
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	838 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	14:21			
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	839 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	14:58			
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	840 (HNO3) (1)		(b) (6)(b) (6)	S: 8/26/2008	13:20			
(b) (6)	Potable W Erik Armis		G TAL TM+B+M (14)	841 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	15:20			
(b) (6)	Potable W Erik Armis		TAL TM+B+M (14)	842 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	16:39			
(b) (6)	Potable W Erik Armis		3 TAL TM+B+M (14)	843 (HNO3) (1)		(b) (6)(b) (6)	S: 8/27/2008	17:07			
Shipment for Case Complete? Y	Sa	ample(s) to be u	sed for laboratory QC:		Additional Sample	er Signature(s):				Chain of Custody Seal No	ımber:
Analysis Key:	<del></del>	Concentration:	L = Low, M = Low/Medium,	H - Hình	Type/Designate:	Composite = C,	Grah - G			Shipment Iced?	***************************************
	1		+Moly, TAL Met+B+ = T/	•	•	•		on+Moly			

TR Number: 3-375524367-090108-0001

## U.S. EPA Region III Analytical Request Form

XTE	3 8-2	5-08			
ASQAB USE ONLY					
RAS#	CT4353	Analytical TAT			
DAS#		14			
NSF#					

37813

Date: 8/21/2008	8 Site Activity: Removal Assessment					
Site Name: Battlefield Golf Club			Street Address: 1001 South Centerville Turnpike			
City: Chesapeake State:		State: VA	Latitude: 36.68982		Longitude: 76.17790	
Program: Superfund Acct. #: 200		Acct. #: 2008T03 N 30	: 2008T03 N 302DC6C A3LM RS00 CERCLIS #: VAN000		306614	
Site ID: Spill		Spill ID: A3LM	ll ID: A3LM Operable Unit:			
Site Specific QA Plan Submitted: No Yes Title: Battlefield Go			olf Club Fly Ash Assessment SAP		Date Approved: 8/20/2008	
EPA Project Leader: CHRIS WAGNER Ph		Phone#:	Phone#: Cell Phone #: 804-337-3049		E-mail: Wagner.Christine@epa.gov	
Request Preparer: JOSHUA COPE		Phone#: 610-364-	0-364-2130 Cell Phone #: 215-768-8114		E-mail: Joshua.cope@ttemi.com	
Site Leader: ERIK ARMISTEAD Phon		Phone#: 610-364-	4-2151 Cell Phone #: 267 446 2837		E-mail: Erik.armistead@ttemi.com	
Contractor: Tetra Tech EM Inc EPA CO/PC			CO/PO: Lorrie Murray/Karen Wodarczyk			
#Samples 30-35 Matrix: soil Parameter: TAL			Metals + Boron + Molybdenum + Hg CHEM		Method: ILM05.4 ICPAES+Hg	
#Samples 20-25	Matrix: groundwater Parameter: TAL M		1etals + Boron + Molybdenum + Hg		Method: ILM05.4 ICPAES+Hg	
#Samples 90-110	Matrix: potable water Parameter: TAL n		netals 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 m		etals 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: No X Yes If Yes, TAT Needed: 24hrs 48hrs 72hrs 72hrs 7chrs 7ch						
Validated Data Package Due: 14 days 21 days 30days 42 days Other (Specify)						
Electronic Data Deliverables Required: No 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 CHEMTEC	H CONSULTING GROUP	Contract: EPW0604	47		
Lab Code: CHEM	Case No.: <u>37813</u>	NRAS No.:	SDC	G No.: MC02	E3 .
SOW No.: <u>ILM05.4</u>					
	EPA Sample No.		Lab Sa	mple ID	
	MC02E2		Z4425	5-02	
	MC02E3		Z4425	5-01	
	MC02E4		Z4425		
	MC02E5		Z442:		
,	MC02E6		Z4425		<del></del>
· ,	MC02E7		Z442:		
	MC02E8 MC02E9		Z442: Z442:		
	MC02F0	•	Z442.		<del></del>
	MC02F1		Z442:		<del></del>
	MC02F2		Z442:		_
	MC02F3		Z442:		<del></del>
	MC02F4		Z442:	5-13	addd trops
	MC02F5		Z442:		
	MC02F6		Z442:		
	MC02F7		Z442:		
	MC02F8		Z442: Z442:		<u> </u>
	MC02F9 MC02G0		Z442:		
	MC02G1		Z442:		
	MC02G1D		Z442:		
	MC02G1S		Z442:		
				ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correcti	ons applied?	(Yes/No)		YES
	CP-MS background correction	ons applied?	(Yes/No)		YES
If yes, were raw data generated before application of background corrections?			(Yes/No)		<u>NO</u>
Comments:					
		V-407			
completeness, for other and in the computer-re	package is in compliance with the conditions detailed adable data submitted on distance in the base of the conditions detailed adable data submitted by the conditions are the conditions and the conditions are the condition	above. Release of the kette (or via an alterna	e data contained ate means of elec	in this hardco	py data package ission, if approve
Signature: Name: (b) (4)(b) (4)					
Date:	9/16/08	Title: (b) (4)(b) (4	-)(b) (4)(b) (4)		AND THE RESERVE OF THE SECOND

## 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: <u>Presence</u>/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	9/16/67	Title: (b) (4)(b) (4)

#### 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 (AI, 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 Surface Water ICP-AES TM+B+Mo by MA 1629.0 and Hg 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.

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

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 1<sup>st</sup> container and use the 2<sup>nd</sup> 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)

Computer Sciences Corporation (CSC)

(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

Region III ESAT RPO (3EA20)

TO

: Christine Wagner

Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield Foli 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

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 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)

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 (≤ 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.

Blanks Affected Analytes

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

	CLV AND ALECT		NON-		
A 76.T A 16 76.7/81787	SAMPLES	POSITIVE	DETECTED	MAK A CI	
ANALYTE	AFFECTED	VALUES	<u>VALUES</u>	<u>BIAS</u>	COMMENTS*
В	MC02G2, MC02G4,	J			SD (26%)
	MC02G5, MC02G6,				CBN (- 30.455 J ug/L)
	MC02G8, MC02H0,		*		
	MC02H1, MC02H2,				
	MC02H3, MC02H8				
	MC02G7, MC02H6,		UL	Low	PBN (- 10.725 J ug/L)
	MC02H7, MC02H9				
	MC02G3, MC02G9,	J			SD (26%)
	MC02H4, MC02H5,				
	MC02J0, MC02J1				
Mo	All Samples		UL	Low	PBN (- 1.470 J ug/L)
Hg	MC02H7, MC02H8,		UL	Low	CBN (- 0.134 J ug/L)
	MC02H9, MC02J0, MC02J1				
Na	All samples Except MC02H7	J			SD (15%)

<sup>\*</sup> 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 (≤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)

(b) (6)

Water

8/27/2008

ug/L

14:58

1.0

(b) (6)

Water

8/26/2008

ug/L

13:20

1.0

Case #: 37813

Sample Number :

Date Sampled : Time Sampled :

Dilution Factor:

Sampling Location:

SDG (b) (6)

Site:

BATTLEFIELD GOLF CLUB

(b) (6)

Water

8/27/2008

ug/L

14:21

1.0

Lab. :

Matrix:

Units:

CHEM Total Metals Number of Soil Samples: 0 Number of Water Samples: 20

b) (6)
b) (6)
Water
ug/L
8/27/2008
15:20
1.0
Flag
Result Flag
B) (6)
(b) (6)
Water
ug/L
8/27/2008
16:39
1.0
Flag
Result Flag
Result
Flag

ANALYTE	CRQL	Result	Flag								
ALUMINUM	200							20			
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							100			
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 :	a de la companya de	(b) (6)(b) (6)									
Matrix :	Water		Water		Water		Water		Water		
Units :	ug/L		ug/L		ug/L		ug/L		ug/L	SOCIO	
Date Sampled :	8/27/2008		8/27/2008		8/27/2008		8/27/2008		8/27/2008	000000	
Time Sampled :		17:07		17:15		18:18		19:30		19:20	September
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		
ANALYTE	CRQL	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								
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

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>5)</b>	(b) (6)(b) (6)	6	(b) (6)(b) (6)	
Matrix :		Water		Water	_	Water		Water	_	Water	0000000
Units:	Units:			ug/L		ug/L		ug/L		ug/L	20000000
Date Sampled :		8/27/2008		8/25/2008		8/29/2008		8/28/2008		8/28/2008	poocoos
Time Sampled :		19:15		19:15		10:12		17:47		09:17	000000
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 :	in the second	(b) (6)	G Service Constant	(b) (6)	***************************************	(b) (6)	**************	(b) (6)	***************************************	(b) (6)	
Sampling Location :		(b) (6)(b) (6)	<b>.</b>	(b) (6)(b) (6)		(b) (6)(b) (6	6)	(b) (6)(b) (6)		(b) (6)(b) (6)	
Matrix :		Water		Water		Water		Water		Water	000000
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	i GEBORIO
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	4.00							
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	7	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** 

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

<del>37814</del> 3783 Case No: DAS No:

Region: Project Code:	3			Date Shipped: 9/2/2008 Cha				of Custody R	ecord		Sampler Signature:	(hintho)
Account Code:	CT4354			Airbill:	961942977974,		Reling	uished By	` (Date / Ti	me)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	ChemTech Con		1					
Spill ID:	ALM				Group (CHEME	:D)	2.					
Site Name/State:	Battlefield C			4	284 Sheffield St Mountainside N		<u>-</u>					
Project Leader:	Erik Armiste		a mit		(908) 789-8900	g						
Action: Sampling Co:	Preliminary Tetra Tech		31 II	on the same								
Sampling Co.	retia recii	EWITTE.					<u> </u>					
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION			COLLECT E/TIME		GANIC PLE 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	BETT VED HEAVEN		
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			
- / ( - /	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)	J.	S: 8/27/2008	14:58			
- / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	840 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	13:20			
- / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	841 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/27/2008	15:20			
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	842 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	16:39			
	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	Sample(s)	to be used t	for laboratory QC:		Additional Sample	r Signature(s):				[0	Chain of Custody Seal Nu	ımber:
Jonipioto : 1			<b>\</b>									
Analysis Key:	Concentra	ation: L	= Low, M = Low/Medium, H	= High	Type/Designate:	Composite = C,	Grab = 0	à			Shipment Iced?	
TAL DM+B+M =	TAL Diss Metals	-Boron+Mo	oly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum,	TAL TM+B+M = 1	AL TO	tal Metals+Boro	n+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)

Al The		To the	M
AR 182	<u> विकास प्राप्त</u>	n a	,

Region:

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Date Shipped:

9/2/2008

\_\_\_\_\_\_

Case No: DAS No:

Chain of Custody Record

Project Code:	CT4354			Carrier Name:	FedEx	,			· · ·		July 1	UMMIN O
Account Code:	U 1 4304			Airbill:	9619429779	974.	Relinc	quished By	(Date / Tin	me)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	ChemTech (		1					
Spill ID:	ALM			and the second	Group (CHE	EMED)	2.	***************************************			<del> </del>	
Site Name/State:	Battlefield G			ian sepangan	284 Sheffield Mountainside		۷.			<del></del>		
Project Leader:	Erik Armiste				(908) 789-89		3.			, 1		
Action:	Preliminary		ent		<b>.</b>		4.	,				
Sampling Co:	Tetra Tech I	EM Inc.				)	T.					
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG N PRESERVATI		STATION			E COLLECT E/TIME		GANIC PLE No.	QC Type
( - ) ( - )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	844 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	17:15			
( <del></del> )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	845 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/27/2008	18:18			
()	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	846 (HNO3) (1)		(b) (6)(b) (6)	1	S: 8/27/2008	19:30			
( - / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	847 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	19:20			
()	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	848 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/27/2008	19:15		,	••
(-) (-)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	849 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/25/2008 ,	19:15			
( - / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	850 (HNO3) (1)		(b) (6)(b) (6)	ı	S: 8/29/2008	10:12			
()	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	851 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/28/2008	17:47			
( ) ( )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	852 (HNO3) (1)		(b) (6)(b) (6)	ı	S: 8/28/2008	9:17			
( - ) ( - )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	853 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	10:13			
( - ) ( - )	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:	Statement	Additional Sam	mpler Signature(s):		Typesperial and a secure source of the facility of the secure of the sec		(	Chain of Custody Seal No	umber:
Analysis Key:	Concentra	_	L = Low, M = Low/Medium, H		Type/Designa						Shipment Iced?	
TAL DM+B+M =	TAL Diss Metals+	Boron+M	loly, TAL Met+B+ = TAI	L Metals + Boron	+ Molybdenur	m, TAL IM+B+M = 1	TAL TO	otal Metals+Boro	n+Moly			

TR Number:

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

<del>37814</del> 3 78 13 Case No: DAS No:

Region:	3				Date Shipped:	9/2/2008		Chain of	Custody R	ecord		Sampler Signature:	· [. [] : (a) di
Project Code:	CT43	354			Carrier Name:	FedEx		5		(D-1-/T		1/1	u www.g
Account Code: CERCLIS ID:	1/45/0	20000001	,		Airbill:	961942977974,		Relinquish	ed By	` (Date / Ti	me)	Received By	(Date / Time)
Spill ID:	ALM	00030661	4		Shipped to:	ChemTech Cons	•	1		·			
Site Name/State:		efield Golf	f/\/Δ			Group (CHEMED 284 Sheffield Str		2.				·	
Project Leader:		Armisteac			Mountainside NJ 07092		3		<del>//</del>				
Action:	Prelin	minary As	sessme	nt		(908) 789-8900							
Sampling Co:	Tetra	Tech EN	1 Inc.					4.					
INORGANIC SAMPLE No.	MAT SAMF		CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	QC Type
(b) (6)	Potable W Erik Armis		M/G	TAL TM+B+M (14)	855 (HNO3) (1)		(b) (6)(b) (6)	S:	8/27/2008	16:13			
(b) (6)	Potable W Erik Armis		M/G	TAL TM+B+M (14)	856 (HNO3) (1)		(b) (6)(b) (6)	S:	8/28/2008	9:45			
b) (6)	Potable W Erik Armis		M/G	TAL TM+B+M (14)	857 (HNO3) (1)		(b) (6)(b) (6)	S:	8/28/2008	10:23			
b) (6)	Potable W Erik Armis		M/G	TAL TM+B+M (14)	858 (HNO3) (1)		(b) (6)(b) (6)	S:	8/28/2008	10:29			
b) (6)	Potable W Erik Armist		M/G	TAL TM+B+M (1,4)	859 (HNO3) (1)		(b) (6)(b) (6)	S:	8/29/2008	11:19			
b) (6)	Potable W- Erik Armist		M/G ·	TAL TM+B+M (14)	860 (HNO3) (1)		(b) (6)(b) (6)(b)	<b>6)</b> S:	8/29/2008	11:19			
b) (6)	Potable W- Erik Armist		M/G	TAL TM+B+M (14)	861 (HNO3) (1)		(b) (6)(b) (6)	S:	8/29/2008	11:30			
b) (6)	Potable We Erik Armist		M/G	TÁL TM+B+M (14)	862 (HNO3). (1)		(b) (6)(b) (6)	S:	8/28/2008	11:13			<del></del>
MC02J7	Soil (>12"). Erik Armist		M/G	TAL Met+B+ (14)	863 (Ice Only), 8 Only) (2)	364 (Ice	BG08-SS-MP0	)1 S:	8/25/2008	10:18			
MC02J8	Soil (>12"), Erik Armist		M/G	TAL Met+B+ (14)	865 (Ice Only), 8 Only) (2)	366 (Ice	BG08-SS-MP0	)2 S:	8/25/2008	11:35			
MC02J9	Soil (>12"), Erik Armist		M/G	TAL Met+B+ (14)	867 (Ice Only), 8 Only) (2)	368 (Ice	BG08-SS-MP0	)3 S:	8/25/2008	12:15			
Shipment for Case Complete? Y	Sa	ample(s) to	be used fo	or laboratory QC:		Additional Sampler	Signature(s):				ľ	Chain of Custody S	eal Number:
				•									
Analysis Key:	C	oncentratio	n: L	= Low, M = Low/Medium, H	= High	Type/Designate:	Composite = C,	Grab = G				Shipment Iced?	
FAL DM+B+M =	TAL Diss N	Vietals+Bo	oron+Mc	ly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum, T	AL TM+B+M =	AL Total	Metals+Boro	n+Moly			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

# U.S. EPA Region III Analytical Request Form

XT:	5 8-2	5-08
7	ASQAB U	SE ONLY
RAS#	CT4353	Analytical TAT
DAS#		14
NSF#		

37813

Date: 8/21/2008	Site Activ	vity: Removal Assessme	nt			
Site Name: Battlefield	d Golf Club		Street Address: 1001 South Centerville Turnpike			
City: Chesapeake		State: VA	Latitude: 36.68982			Longitude: 76.17790
Program: Superfund Acct. #: 2008T03 N		Acct. #: 2008T03 N 30	2DC6C	A3LM RS00	CERCLIS #: VAN000	306614
Site ID:		Spill ID: A3LM			Operable Unit:	
Site Specific QA Plan	Submitted: No No	es Title: Battlefield Go	olf Club F	Fly Ash Assessment SA	P	Date Approved: 8/20/2008
EPA Project Leader:	CHRIS WAGNER	Phone#:		Cell Phone #: 804-33	7-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JO	SHUA COPE	Phone#: 610-364-2	2130	Cell Phone #: 215-76	8-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK A	RMISTEAD	Phone#: 610-364-2	2151	Cell Phone #: 267 44	6 2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tec	h EM Inc	EPA CO/PO: Lorr	ie Murra	y/Karen Wodarczyk		
#Samples 30-35	Matrix: soil	Parameter: TAL M	1etals + E	Boron + Molybdenum +	Hg CHEM	Method: ILM05.4 ICPAES+Hg
#Samples 20-25	Matrix: groundwater	Parameter: TAL M	letals + E	Boron + Molybdenum +		Method: ILM05.4 ICPAES+Hg
#Samples 90-110	Matrix: potable water	Parameter: TAL m	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,	Ca, Fe, K, Mg, Na			Method: ILM05.4 ICPAES
#Samples 20-25	Matrix: groundwater	Parameter: TAL m	L 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,	Ca, Fe, K, Mg, Na			Method: ILM05.4 ICPAES
#Samples	Matrix:	Parameter: -				Method:
#Samples	Matrix:	Parameter:				Method:
Ship Date From: 8/29	/2008 Ship Da	ate To: 9/3/2008	Org. Va	Org. Validation Level		Inorg. Validation Level IM2
Unvalidated Data Req	uested: 🗌 No 🔀 Yes	If Yes, TAT Needed:	24hr	s 48hrs 72hrs	☐7days ☐ Other	(Specify)14 days
Validated Data Packag	ge Due: 🗌 14 days 🔲2	l days 🛛 30days 🔲	42 days .	.   Other (Specify)		
Electronic Data Delive	erables Required: 🔲 No	Yes (EDDs will be	provide	d in Region 3 EDD For	mat)	
Special Instructions: S	ee attached DLs.					
		•	•			

# Appendix D

**Laboratory Case Narrative** 

### USEPA - CLP

### COVER PAGE

Case No.: 37813   NRAS No.: 1629.0   SDG No.: MC02G2	Lab Name CHEMTEC	TH CONSULTING GROUP	Contract: EPW0604	17		
EPA Sample No.    MC02G2	Lab Code: CHEM	Case No.: <u>37813</u>	NRAS No.: <u>1629.0</u>	SDC	No.: MC020	32
MC02G2	SOW No.: <u>ILM05.4</u>					
MC02G3		EPA Sample No.		Lab San	nple ID	
MC02G4						<del></del>
MC02G5 MC02G6 MC02G7 MC02G8 MC02G8 MC02G9 MC02G9 MC02H0 MC02H0 MC02H0 MC02H1 MC02H1 MC02H3 MC02H3 MC02H3 MC02H4 MC02H3 MC02H5 MC02H5 MC02H5 MC02H5 MC02H5 MC02H5 MC02H6 MC02H1 MC						
MC02G6 MC02G7 MC02G8 MC02G9 MC02G9 MC02H0 MC02H1 MC02H1 MC02H1 MC02H1 MC02H3 MC02H4 MC02H4 MC02H4 MC02H4 MC02H4 MC02H5 MC02H6 MC02H6 MC02H6 MC02H7 MC02H7 MC02H8 MC02H7 MC02H8 MC02H8 MC02H8 MC02H8 MC02H9 MC02H9 MC02H9 MC02H9 MC02H9 MC02H9 MC02H0 MC02H1 MC02H8 MC02H9 MC02H0 MC02H1 MC						_
MC02G7 MC02G8 MC02G9 MC02H0 MC02H0 MC02H1 MC02H1 MC02H1 MC02H2 MC02H2 MC02H3 MC02H3 MC02H4 MC02H3 MC02H4 MC02H4 MC02H5 MC02H5 MC02H6 MC02H6 MC02H6 MC02H7 MC02H6 MC02H7 MC02H8 MC02H7 MC02H8 MC02H7 MC02H8 MC02H9 MC02H0 MC02H1 MC02H0 MC02H1 MC02H1 MC02H0 MC02H1 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H0 MC02H1 MC02H1 MC02H0 MC02H1 MC02H1 MC02H1 MC02H0 MC02H1 MC						_
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MC02H0 MC02H1 MC02H2 MC02H2 MC02H3 MC02H3 MC02H4 MC02H3 MC02H4 MC02H5 MC02H5 MC02H5 MC02H6 MC02H6 MC02H6 MC02H7 MC02H7 MC02H8 MC02H8 MC02H8 MC02H8 MC02J0 MC02J10 MC02J10 MC02J1D MC02J1D MC02J1D MC02J1S  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) NO  If yes, were raw data generated before application of background corrections?  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.  Name: (5) (4)(b) (4)						<del></del>
MC02H0 MC02H1 MC02H3 MC02H3 MC02H4 MC02H4 MC02H4 MC02H5 MC02H5 MC02H5 MC02H6 MC02H6 MC02H7 MC02H6 MC02H7 MC02H7 MC02H8 MC02H8 MC02H8 MC02H8 MC02H8 MC02H9 MC02H8 MC02H9 MC02H9 MC02H1 MC02H8 MC02H9 MC02H1 MC02H8 MC02H0 MC02H1 MC			*			
MC02H1 MC02H2 MC02H3 MC02H4 MC02H4 MC02H5 MC02H5 MC02H6 MC02H6 MC02H6 MC02H6 MC02H7 MC02H7 MC02H7 MC02H8 MC02H8 MC02H8 MC02H9 MC02H9 MC02H9 MC02D1 MC02D1 MC02D1 MC02D1 MC02J1 MC						
MC02H3 MC02H4 MC02H5 MC02H6 MC02H6 MC02H7 MC02H6 MC02H7 MC02H8 MC02H8 MC02H8 MC02H8 MC02H8 MC02H9 MC02J0 MC02J1 MC						<del></del>
MC02H4 MC02H5 MC02H6 MC02H7 MC02H7 MC02H8 MC02H8 MC02H9 MC02H9 MC02H9 MC02J10 MC02J10 MC02J10 MC02J1D MC02J1D MC02J1S MC02J1S  ICP-AES ICP-MS  Were ICP-AES and ICP-MS interelement corrections applied? (Yes/No) YES If yes, were raw data generated before application of background corrections?  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.  Name: (5) (4) (5) (4)						<del></del>
MC02H5 MC02H7 MC02H8 MC02H8 MC02H9 MC02J0 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1S MC02J1 MC02J1 MC02J1S MC02J1 MC02J1S MC02J1 MCP-AES ICP-AES						
MC02H6 MC02H7 MC02H8 MC02H9 MC02H9 MC02I0 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1S  ICP-AES ICP-MS  Were ICP-AES and ICP-MS interelement corrections applied? (Yes/No) YES If yes, were raw data generated before application of background corrections?  Were ICP-AES and ICP-MS background corrections applied? (Yes/No) YES If yes, were raw data generated before application of background corrections?  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.  Name: 5) (4)(5) (4)						
MC02H7 MC02H9 MC02J0 MC02J0 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1 MC02J1S MC02J1S MC02J1S MC02J1S MC02J1S MC02J1S  ICP-AES ICP-MS  Were ICP-AES and ICP-MS interelement corrections applied? (Yes/No) YES If yes, were raw data generated before application of background corrections? (Yes/No) NO  If yes, were raw data generated before application of background corrections?  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:  Name: (b) (4)(b) (4)						<del></del>
MC02H8 MC02H9 MC02J0 MC02J1 MC02J1 MC02J1D MC02J1S  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?  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.  Name: (b) (4)(b) (4)						**************************************
MC02J10 MC02J1D MC02J1D MC02J1S  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.  Name: (b) (4)(b) (4)						
MC02J1D MC02J1S  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.  Name: (b) (4)(b) (4)						_
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MC02JIS  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.  Name: (b) (4)(b) (4)						
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.  Name: (b) (4)(b) (4)						
Were ICP-AES and ICP-MS interelement 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.  Name: (b) (4)(b) (4)		MC02J1S		<u>Z4400</u>	-22	_
Were ICP-AES and ICP-MS background corrections applied?  If yes, were raw data generated before application of background corrections?  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.  Name: (b) (4)(b) (4)					ICP-AES	ICP-MS
If yes, were raw data generated before application of background corrections?  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:  Name: [b) (4)(b) (4)	Were ICP-AES and I	CP-MS interelement correction	ns applied?	(Yes/No)	YES	
application of background corrections?  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:  Name: [b) (4)(b) (4)		<del>-</del>	ns applied?	(Yes/No)	YES	
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:  Name: [b) (4)(b) (4)				(Yes/No)	NO	week land a land on the land of the land o
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:  Name: [b] (4)(b) (4)		FIERS ON FORM I AND VI	II FOR BORON ANI	D SODIUM IND	DICATE CHE	MICAL OR
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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: [b] (4)(b) (4)			SOSTECTED DOTA	THO THOUSE SE		
(A)	completeness, for othe and in the computer-re in advance by USEPA	r than the conditions detailed a adable data submitted on disk	above. Release of the ette (or via an alterna	e data contained te means of elec	in this hardco tronic transmi	py data package ission, if approved
Date: Title: (b) (4)(b) (4)(b) (4)	Signature:	(+)	Name: (b) (4)(b) (4	4)		
	Date:	9116/08	Title: (b) (4)(b) (4	)(b) (4)		

COVER PAGE

# 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: <u>Presence/Absence</u> 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)
В	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**

		11	Preliminary	PDF	(A)	Cost For Modified Analysis	
Analysis	Modification Reference Number	Hardcopy Turnaround Requirement	Turnaround Results		Estimated No. of Samples by Matrix (including billable QC)	(B) New Per Sample Price	(A × 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	\$

D	rni		<b>~</b> 4	Info	rma	tion	
٣	roj	Ú	Çι	11110	mna	uon	

Estimated Shipping Period:

8/29/2008 through 9/3/2008

Additional Information: P

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 Laboratory DECLINES to perform analysis through the modified analysis protocol outlined in Modified analysis protoc	
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.

Received By (Signature)		agonolomonico o o o o o o o o o o o o o o o o o o					
Case Number 37813		Sample Delive	ry Group	No. N	4C02G2	NRAS Nun	nber
Remarks:					Correspond	ding	
1. Custody Seal(s)	Present/Absent* Infact/Broken	Aconomic designation of the control	THE PROPERTY OF THE PROPERTY O			RECOVERAGE AND A STATE OF THE S	Remark Condition
<ol> <li>Custody Seal Nos.</li> <li>Traffic Reports/Chain Of</li> </ol>	Present/Absent*	EPA Sample	Aqueous Sample pH		mple Tag #	Assigned Lab #	Sample shipmer etc.
Custody Reports or Packing Lists	TESOM/ AUSEIN	MC02G2	NA	-	38	Z4400-01	INTAC
4. Airbill	Airbill/Sticker	MC02G3	1 1	A 8	39	Z4400-02	
4. AIFDIII	Present/Absent*	MC02G4	1 /	THE REST OF THE PERSON NAMED IN	40	Z4400-03	
5. Airbill No.	961942977974	MC02G5		AN ARTHUM PROPERTY AND ADDRESS OF THE PARTY AN	41	Z4400-04	
	Resent/Absent*	MC02G6		¥ 8	43	Z4400-05	
6. Sample Tags Sample Tag #		MC02G7		¥ 8	· <b>4</b> 3	Z4400-06	
	On TR/Chain-of-Custody	MC02G8		MANAGEMENT OF THE PERSON NAMED IN	4.4	Z4400-07	
7. Sample Condition	Intac/Broken*/Leaking	MC02G9		***************************************	345	Z4400-08	
8. Cooler Temperature Indicator Bottle	Present/Absent*	MC02H0	1 1	AND DESCRIPTION OF THE PERSON	346	Z4400-09	um Anti-Pro-estantantan ekitika (1900) (Marana
9. Cooler Temperature	4°C	MC02H1	1		847	Z4400-10	THE RESERVE OF THE PARTY OF THE
10. Does information on	Ves/No*	MC02H2		2000	8 4 8	Z4400-11	
custody records, traffic reports,		MC02H3	]	¥ 8	349	Z4400-12	
and		MC02H4		Ţ-	850	Z4400-13	
sample tags aggree?		MC02H5		头	851	Z4400-14	
11. Date Received at Lab	9:30 AM	MC02H6		\$P	852	Z4400-15	
12. Time Received	9:30 AM	MC02H7		¥	853	Z4400-16	
Sample	Transfer	MC02H8	] [	≽	854	Z4400-17	
	The second secon	MC02H9		<b>₹</b>	<i>જેડ</i> જ	Z4400-18	
Fraction METALS	Fraction	MC02J0		₹	856	Z4400-19	
Area # Q53	Area #	MC02J1			<b>१</b> ८७	Z4400-20	
By CHRis	Ву	MC02J1D		≯	857	Z4400-21	
On 9.15.08	9r	MC02J1S		<b>%</b> -	857	Z4400-22	
		Martina Mill Copie Controlleri, we held with hit the little cost account was been			nggarasan sakahili qirii		-
* Contact SMO and attac	ch record of resolution		A	decen	(b)	(4)	
Reviewed By (b) (4)(b)  Date 9./5.08		L	ogbook N	ο.	(b)	(4)	

FORM DC-1

ILM05.3



# 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 (Colf 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

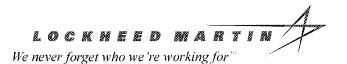
cc: Joshua Cope (TTEMI)

TO File #: 0014

TDF#: 0986

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

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: MC02G3

Site: Battlefield Golf Club

From:

(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) 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

		POSITIVE	NON- DETECTED		
<u>ANALYTE</u>	SAMPLES AFFECTED	<u>VALUES</u>	VALUES	<u>BIAS</u>	COMMENTS*
Sb	MC02G2, MC02G3, MC02G5	В		High	CCB (0.310 J ug/L)
Cd	MC02G5, MC02G7, MC02H0, MC02H2	В		High	CCB (0.180 Jug/L)
	MC02H6, MC02H7	В		High	CCB (0.177 J ug/L)
Cr	МС02Н3	В		High	CCB (0.107 J ug/L)
	MC02H6	В		High	CCB (0.107 J ug/L)
Pb	MC02G2	В		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	В		High	CCB (0.093 J ug/L) MSL (48%)
	MC02G5, MC02G6, MC02H0	В		High	CCB (0.090 J ug/L) MSL (48%)
	MC02H5, MC02H6	В		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	В		High	CCB (0.163 J ug/L)

<sup>\*</sup> See explanation of comments in Table 1B

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

Case 37813, SDG MC02G3

ANALYTE	SAMPLES AFFECTED	POSITIVE <u>VALUES</u>	NON- DETECTED <u>VALUES</u>	BIAS	COMMENTS*
V	MC02G2, MC02G3, MC02G4, MC02G5, MC02G6, MC02G7, MC02G8, MC02G9, MC02H0, MC02H1, MC02H2, MC02H3, MC02H4	В		High	CCB (0.350 J ug/L)
	MC02H5, MC02H6, MC02H8, MC02H9, MC02J0, MC02J1	В		High	CCB (0.270 J ug/L)

<sup>\*</sup> 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 ≤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

SDG : (b) (6)

Number of Soil Samples: 0

Site:

BATTLEFIELD GOLF CLUB

Number of Water Samples: 20

Lab.:

CHEM

**Total Metals** 

		Drag	*********	lotal 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	00000000000
Units:		ug/L		ug/L		ug/L		ug/L		ug/L	NO CONTRACTOR OF THE PERSON OF
Date Sampled :		8/27/2008		8/27/2008		8/26/2008		8/27/2008		8/27/2008	Opposed
Time Sampled :		14:21		14:58		13:20		15:20		16:39	30000
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	В	1.1	В			0.22	В		
*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			0.10	J		9
*CADMIUM	1							0.10	В		
*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	90000
*LEAD	1	0.27	В	2.4		2.0		1,3		0.20	J
MANGANESE	1	165		169	2000000	11.1		232		6.9	000000
*NICKEL	1	2.4		2.6		0.80	J	1.7		0.68	J
SELENIUM	5									ĺ	30
SILVER	1	0.037	В	0.083	В		UL	0.097	В	0.043	В
THALLIUM	1			0.12	В				0		20000000
VANADIUM	5	1.0	В	1.1	В	1.3	В	1.2	В	1.2	В
ZINC	2	61.7		24.6		12.4		13.8		2.6	00000

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

SDG : (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

#### **Total Metals**

				TOTAL INICIAIS							**********
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 :	00000	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	2000000	1.4	on the same
BARIUM	10	9.3	J	1.6	J	1.9	J	5.6	J	1.7	J
BERYLLIUM	1										0
*GADMIUM	1	0.10	В					0.26	В		
*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	300000	2.1	000000
*LEAD	1	6.0		0.54	J	2.0		6.3		0.22	J
MANGANESE	1	112		5.9		8.4		11.1	0000000	10.2	000000
*NICKEL	1	0.47	J	0.78	J	0.89	J	1.7	0	0.55	J
SELENIUM	5								0000000		SECOND
SILVER	1		UL		UL		UL	0.040	В		UL
THALLIUM	1								20000		0
VANADIUM	5	1.5	В	1.1	В	0.63	В	1.2	В	1.3	В
ZINC	2	42.3		3.4		7.3		71.5		3.3	00000

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

SDG : (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

#### Total Metals

Sample Number :	e Number :			(b) (6)		(b) (6)	envocecoco.	(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6)	8	(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6	
Matrix : Units : Date Sampled :	Water ug/L 8/27/2008		Water ug/L 8/25/2008		Water ug/L 8/29/2008		Water ug/L 8/28/2008		Water ug/L 8/28/2008	000000000000000000000000000000000000000	
Time Sampled : Dilution Factor :		19:15 1.0		19:15 1.0		10:12 1.0		17:47 1.0		09:17 1.0	200000
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	<u> </u>	Flag
ANTIMONY	2		*******		Ĭ				T		i i
*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				NO. OF THE LOCAL PROPERTY.				and		
*CADMIUM	1	0,10	В							0.12	В
*CHROMIUM	2	0.57	J	0.52	В	0.57	J	0.65	J	0.52	В
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	В	0.043	В
THALLIUM	1		_								
VANADIUM	5	1.1	В	0.90	В	0.69	В	1.0	В	1.2	В
ZINC	2	66.5	9	11.6		28.1	<b></b>	30.2	200	73.2	

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

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	Flan	Result	Flag	Result	Flag	Result	Flan		Flag
ANTIMONY	2	ricount	iag	Troodic	, idg	Tiodit	109	rioduit	1 149	Hodait	1 109
*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	10	0.51	J	00.0		0,50	J	77.0		00.0	
*CADMIUM	1	0.16	В								
*CHROMIUM	2	0.10	J	0.69	J	0.75	J	0.63	J	0.71	e J
COBALT	1	0.99 8.7	J	0.09	J	0.73	J	0.03	. U	0.71	J
COPPER	2	55.3		15.6		148	9	16.4		24.3	
*LEAD	1	55.5 12.2		0.67	J	140		10.4		24.3 2.1	
		•	00 00 00	178	,	2.4		238		∡. ا 166	
MANGANESE		102				<b>1</b>		*******************************			
*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										В
VANADIUM	5	2,4	J	0.76	В	0.75	В	0.87	В	1.2	В
ZINC	2	40.0		18.4	Ŏ	16.9	i	8.4		38.7	70

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

Appendix C
Chain of Custody Records

# U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF#

378/3

	Site Activit	ty: Removal Assessme	ent						
l Golf Club			Street A	Address: 1001 South Co	enterville Turnpike				
		State: VA	Latitud	le: 36.68982		Longitude: 76.17790			
		Acct. #: 2008T03 N 30	)2DC6C	A3LM RS00	CERCLIS #: VAN0003	306614			
		Spill ID: A3LM							
Site Specific QA Plan Submitted: ☐ No ☐ Yes Title:			olf Club	Fly Ash Assessment SA	Date Approved: 8/20/2008				
EPA Project Leader: CHRIS WAGNER				Cell Phone #: 804-33	37-3049	E-mail: Wagner.Christine@epa.gov			
SHUA COPE		Phone#: 610-364-	2130	Cell Phone #: 215-76	68-8114	E-mail: Joshua.cope@ttemi.com			
RMISTEAD		Phone#: 610-364-	2151	Cell Phone #: 267 44	16 2837	E-mail: Erik.armistead@ttemi.com			
h EM Inc		EPA CO/PO: Lon	rie Murra	ny/Karen Wodarczyk					
Matrix: soil		Parameter: TAL N	/letals + l	Boron + Molybdenum -	+ Hg CHEM	Method: ILM05.4 ICPAES+Hg			
Matrix: ground	lwater	Parameter: TAL N	/letals + 1	Boron + Molybdenum -		Method: ILM05.4 ICPAES+Hg			
Matrix: potable	Parameter: TAL n	netals Lo	w(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg				
Matrix: potable	Parameter: Al, Ca	, Fe, K, N	Mg, Na		Method: ILM05.4 ICPAES				
Matrix: ground	lwater	Parameter: TAL n	netals Lo	w(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg			
Matrix: ground	lwater	Parameter: Al, Ca	Fe, K, N	Mg, Na	Method: ILM05.4 ICPAES				
Matrix:	-	Parameter:				Method:			
Matrix:		Parameter:		•		Method:			
/2008	Ship Date	e To: 9/3/2008	Org. Va	alidation Level		Inorg. Validation Level IM2			
uested: No	X Yes	If Yes, TAT Needed:	☐ 24hı	rs 48hrs 72hrs	7days Other (	Specify)14 days			
Validated Data Package Due: 14 days 21 days 30days 42 days Other (Specify)									
Electronic Data Deliverables Required: No Yes (EDDs will be provided in Region 3 EDD Format)									
ee attached DLs.									
	Submitted:  CHRIS WAGNE SHUA COPE RMISTEAD h EM Inc Matrix: soil Matrix: ground Matrix: potable Matrix: potable Matrix: ground Matrix: ground Matrix: ground Matrix: description Matrix: ground Matrix: ground Matrix: matrix: Matrix: Matrix:  12008  Lested:  No Le Due:  14 description	Submitted: No Yee CHRIS WAGNER SHUA COPE RMISTEAD h EM Inc Matrix: soil Matrix: groundwater Matrix: potable water Matrix: potable water Matrix: groundwater Matrix: groundwater Matrix: groundwater Matrix: groundwater Matrix: descent of the second of the s	State: VA  Acct. #: 2008T03 N 30  Spill ID: A3LM  Submitted:	State: VA  Acct. #: 2008T03 N 302DC6C  Spill ID: A3LM  Submitted: No Yes Title: Battlefield Golf Club  CHRIS WAGNER  Phone#: SHUA COPE  Phone#: 610-364-2130  Phone#: 610-364-2151  Phone#: 610-364-2151  Phone#: TAL Metals + 1  Matrix: soil  Parameter: TAL Metals + 1  Matrix: potable water  Matrix: potable water  Matrix: potable water  Parameter: TAL metals Lo  Matrix: groundwater  Parameter: TAL metals Lo  Matrix: groundwater  Parameter: TAL metals Lo  Matrix: groundwater  Parameter: Al, Ca, Fe, K, N  Matrix:  Parameter: Al, Ca, Fe, K, N	Street Address: 1001 South Color   State: VA	State: VA			

& EPA
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Case No: DAS No:

Region: Project Code:	3		***************************************	uccoccccionate de Company de Comp	Date Shipped:	9/2/2008 FedEx	egigenessenen protesteren politik in	Chaii	n of Custody R	ecord		Sampler Signature:	Thinked!
Account Code:	CT435	04			Airbill:	961942977974	L	Relino	uished By	(Date / 1	Time)	Received By	(Date / Time)
CERCLIS ID:	VANO	00306614			Shipped to:	ChemTech Co	. '	1					
Spill ID:	ALM					Group (CHEMI	ED)	2.		w			
Site Name/State: Project Leader:	Danio	field Golf/V	A			284 Sheffield S Mountainside N		<b></b>					
Action:		rmistead ninary Asse	ssment			(908) 789-8900	)	3.			•		
Sampling Co:		Tech EM In					,	4.					
INORGANIC SAMPLE No.	MATE SAMPI			ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION	annong grand		COLLECT E/TIME		GANIC PLE No.	QC Type
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	844 (HNO3) (1)	etricites anno anno no control	(b) (6)(b) (6)	***************************************	S: 8/27/2008	17:15		SSESSESSESSESSESSESSESSESSESSESSESSESSE	
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	845 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	18:18			
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	846 (HNO3) (1)	•	(b) (6)(b) (6)	J	S: 8/27/2008	19:30			
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	847 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	19:20			
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	848 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	19:15			•
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	849 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	19:15			
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	850 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/29/2008	10:12			
(b) (6)	Potable We Erik Armiste		G T	ÁL TM+B+M (14)	851 (HNO3) (1)		(b) (6)(b) (6)		S: 8/28/2008	17:47			
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	852 (HNO3) (1)		(b) (6)(b) (6)		S: 8/28/2008	9:17			
(b) (6)	Potable We Erik Armiste		G Т	AL TM+B+M (14)	853 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	10:13			
(b) (6)	Potable We Erik Armiste		G T	AL TM+B+M (14)	854 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	15:41			
Shipment for Case Complete? Y	Sar	mple(s) to be	used for	laboratory QC:		Additional Sampl	er Signature(s):	innonessiones		ekenyesi asasa (220minintalisis tasa		Chain of Custody Seal N	andausassassassassassassassassassassassassa
Analysis Key:	Co	ncentration:	L=1	_ow, M = Low/Medium, H	= High	Type/Designate:	Composite = C,	Grab = 0	G .			Shipment Iced?	
TAL DM+B+M =	TAL DISS M	ietals+Boro	n+Moly	, TAL Met+B+ = TAI	_ Metals + Boron	+ Molybdenum,	TAL TM+B+M =	AL To	otal Metals+Boro	n+Moly			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.



AGUSTA RESPONSE TO THE C		APPENDED.	P	A
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Case No: <del>37814-</del> 3783

Control   Cont	Region: Project Code:	3	3 CT4354		Date Shipped: 9/2/2008  Carrier Name: FedEx				of Custody R	ecord	Sampler Signature:	(hintho)	
CERCLES   CFA ALM   Sale   Line   Shipped 1se:   Chem Tech Consulting Group (CHEMED)   2   2	Account Code:	CT4354			S .		•	Relinqui	ished By	➤ (Date / Tir	me)	Received By	(Date / Time)
Spail ID:   ALM   Statistical GolfV/A   St	CERCLIS ID:	VAN00030	6614		1		··-·						
Sampling Color   Samp	9 '					Group (CHEME	D)	2	**************************************				· · · · · · · · · · · · · · · · · · ·
Sample Co.   Preliminary Assessment   Control   Sample Co.   Sample	8	Dattionold			0.000								
Sampling Do:   Tetra Tech EM Inc.   Tetra Tetr	3			ent				3.					
NORGANIC SAMPLE No.   SAMPLE COLLECT ORGANIC SAMPLE No.	§			GIII	200			4.					
SAMPLE No.   SAMPLE No.   Type   TUNNAROUND   PRESERVATIVE Bottles   LOCATION   DATETIME   SAMPLE No.   Type	SOCIAL CONTROL		0.0000000000000000000000000000000000000	ANALYCICA	TACA		OT A TIOM		CANADI	COLLEGE	0.00		
Erik Armistead   Potable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   834 (HNO3) (1)   D1(0)(0)   S: 8/27/2008   11:56													
Erik Armistead	(b) (6)		M/G	TAL TM+B+M (14)	833 (HNO3) (1)		(b) (6)(b) (6)	5	S: 8/27/2008	11:24		<u> </u>	
Erik Armistead    O   C   Potable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   836 (HNO3) (1)   O   C   O   O   O   O   O   O   O   O	(b) (6)		M/G	TAL TM+B+M (14)	834 (HNO3) (1)		(b) (6)(b) (6)	5	S: 8/27/2008	11:56			
Erik Armistead	(b) (6)		M/G	TAL TM+B+M (14)	835 (HNO3) (1)		(b) (6)(b) (6)	9	S: 8/27/2008	12:24			
Erik Armistead	(b) (6)		M/G	TAL TM+B+M (14)	836 (HNO3) (1)		(b) (6)(b) (6)	8	S: 8/27/2008	13:18			
Erik Armistead	(b) (6)		M/G	TAL TM+B+M (14)	837 (HNO3) (1)		(b) (6)(b) (6)	9	8: 8/27/2008	13:39			
Erik Armistead    Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   840 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   841 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   841 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   842 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   842 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   M/G   TAL TM+B+M (14)   843 (HNO3) (1)   Dotable Well/ Erik Armistead   Dotable	(b) (6)		M/G.	TAL TM+B+M (14)	838 (HNO3) (1)		(b) (6)(b) (6)	9	S: 8/27/2008	14:21 /			
Erik Armistead  [5) (6) Potable Well/ Erik Armistead  [6) (6) Potable Well/ Erik Armistead  [6) (6) Potable Well/ Erik Armistead  [7] Filk Armistead  [8] (8) Potable Well/ Erik Armistead  [8] (9) (10) Potable Well/ Erik Armistead  [8] (10) (10) Potable Well/ Erik Armistead  [8] (10) (10) Potable Well/ Erik Armistead  [8] (10) (10) Potable Well/ Erik Armistead  [9] Sample(s) to be used for laboratory QC:  Additional Sampler Signature(s):  Chain of Custody Seal Number:  Chain of Custody Seal Number:	(b) (6)		M/G	TAL TM+B+M (14)	839 (HNO3) (1)		(b) (6)(b) (6)	9	S: 8/27/2008	14:58 .			
Erik Armistead  Dotable Well/ M/G TAL TM+B+M (14) 842 (HNO3) (1)	(b) (6)		M/G	TAL TM+B+M (14)	840 (HNO3) (1)		(b) (6)(b) (6)	9	S: 8/26/2008	13:20			
Erik Armistead  Potable Well/ M/G TAL TM+B+M (14) 843 (HNO3) (1) (b) (6) (b) (6) S: 8/27/2008 17:07 Erik Armistead  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 lced?	(b) (6)		M/G	TAL TM+B+M (14)	841 (HNO3) (1)		(b) (6)(b) (6)	9	6: 8/27/2008	15:20			
Erik Armistead  Shipment for Case Complete? Y  Sample(s) to be used for laboratory QC:  Additional Sampler Signature(s):  Chain of Custody Seal Number:  Chain of Custody Seal Number:  Chain of Custody Seal Number:  Shipment loed?	(b) (6)		M/G	TAL TM+B+M (14)	842 (HNO3) (1)		(b) (6)(b) (6)	9	S: 8/27/2008	16:39			
Complete? Y  Analysis Key:  Concentration: L = Low, M = Low/Medium, H = High  Type/Designate: Composite = C, Grab = G  Shipment Iced?	(b) (6)		M/G	TAL TM+B+M (14)	843 (HNO3) (1)		(b) (6)(b) (6)	S	5: 8/27/2008	17:07			
Analysis Key: Concentration: L = Low, M = Low/Medium, H = High Type/Designate: Composite = C, Grab = G Shipment Iced?		Sample(	s) to be used	for laboratory QC:		Additional Sample	· Signature(s):	33500000000000000000000000000000000000	000000000000000000000000000000000000000	000000000000000000000000000000000000000	GOOD STREET, S	Chain of Custody Seal N	lumber:
	Complete? Y												
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	Analysis Key:	Concen	tration:	L = Low, M = Low/Medium, F	l = High	Type/Designate:	Composite = C,	Grab ⇒ G	<del></del>			Shipment Iced?	
	TAL DM+B+M =	TAL Diss Metals	s+Boron+N	foly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum, 1	AL TM+B+M =	IAL Tota	al Metals+Boro	n+Moly			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

CONSCIONANT REPRESENTATION CONTROL CON

		P	Δ
AND REAL	COMMON	24 24	, 5

Case No: DAS No:

Region: Project Code:	3			Date Shipped:	9/2/2008		Chai	n of Custody R	ecord		Sampler Signature:	Minhal
Account Code:	CT4354			Carrier Name: Airbill:	FedEx 96194297797	·A	Relino	uished By	` (Date / Tin	ne)	Received By	(Date / Time)
CERCLIS ID:	VAN0003066	314		Shipped to:	ChemTech Co		1					
Spill ID:	ALM			Group (CHEMED)		2.			*****			
Site Name/State:	Battlefield G	olf/VA			284 Sheffield Street Mountainside NJ 07092		2.					
Project Leader:	Erik Armiste	ad			(908) 789-890	, ,	3.					
Action:	Preliminary .	Assessm	ent		(000) / 00 000							
Sampling Co:	Tetra Tech I	EM Inc.					4.				·	
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION		SAMPLE DATE	COLLECT E/TIME		GANIC PLE No.	QC Type
	table Well/ k Armistead	M/G	TAL TM+B+M (14)	855 (HNO3) (1)		(b) (6)(b) (6)	Solitoria	S: 8/27/2008	16:13			
	table Well/ k Armistead	M/G	TAL TM+B+M (14)	856 (HNO3) (1)		(b) (6)(b) (6)	ı	S: 8/28/2008	9:45			
(-) (-)	table Well/ k Armistead	M/G	TAL TM+B+M (14)	857 (HNO3) (1)		(b) (6)(b) (6)		S: 8/28/2008	10:23 ~			
	table Well/ k Armistead	M/G	TAL TM+B+M (14)	858 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/28/2008	10:29			
	table Well/ k Armistead	M/G	TAL TM+B+M (14)	859 (HNO3) (1)		(b) (6)(b) (6)		S: 8/29/2008	11:19			
	table Well/ k Armistead	M/G	TAL TM+B+M (14)	860 (HNO3) (1)		(b) (6)(b) (6)(b)	<b>(6)</b>	S: 8/29/2008	11:19			
	table Well/ k Armistead	M/G	TAL TM+B+M (14)	861 (HNO3) (1)		(b) (6)(b) (6)		S: 8/29/2008	11:30			
	table Well/ k Armistead	M/G	TAL TM+B+M (14)	862 (HNO3), (1)	•	(b) (6)(b) (6)		S: 8/28/2008	11:13			
	il (>12")/ k Armistead	M/G	TAL Met+B+ (14)	863 (Ice Only), 8 Only) (2)	364 (Ice	BG08-SS-MP0	01	S: 8/25/2008	10:18			
	il (>12")/ k Armistead	M/G	TAL Met+B+ (14)	865 (Ice Only), 8 Only) (2)	366 (Ice	BG08-SS-MP0	02	S: 8/25/2008	11:35			
	ił (>12")/ k Armistead	M/G	TAL Met+B+ (14)	867 (Ice Only), 8 Only) (2)	368 (Ice	BG08-SS-MP(	03	S: 8/25/2008	12:15			
Shipment for Case	Sample(s)	to be used	for laboratory QC:		Additional Samp	oler Signature(s):				T	Chain of Custody Seal N	lumber:
Complete? Y			•									
Analysis Key:	Concentra	tion:	_ = Low, M = Low/Medium, F	l = High	Type/Designate	e: Composite = C,	Grab =	G			Shipment Iced?	
TAL DM+B+M = TA	L Diss Metals+	Boron+M	oly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum	n, TAL TM+B+M = 1	AL T	otal Metals+Boro	n+Moly			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Appendix D

Laboratory Case Narrative

# USEPA - CLP

### **COVER PAGE**

Lab Name CH	EMTECH CONSULTING GROUP	Contract: EPW0604	7		
Lab Code: CH	IEM Case No.: <u>37813</u>	NRAS No.:	SD	G No.: MC02	G3
SOW No.: IL	M05.4				
	EPA Sample No.		Lab Sa	mple ID	
	MC02G2		Z442	6-02	
	MC02G3		Z442		
	MC02G4		Z442		
	MC02G5		Z442		•
	MC02G6		Z442		<del></del>
, ,	MC02G7		Z442		
	MC02G8		Z442		
	MC02G9		Z442	6-08	
	MC02H0	• /	Z442	6-09	
	MC02H1		Z442	6-10	
	MC02H2		Z442		
	MC02H3		Z442		
	MC02H4		Z442		
	MC02H5		Z442		
	MC02H6		<u>Z442</u>		<del></del>
•	MC02H7		Z442		
	MC02H8		Z442		
	MC02H9 MC02J0		Z442		
	MC02J1		Z442 Z442		
	MC02J1D		Z442 Z442		<del>_</del>
	MC02J1S		Z442 Z442		
	141002010			0 22	
				ICP-AES	ICP-MS
Were ICP-AI	ES and ICP-MS interelement correction	ns applied?	(Yes/No)		YES
	ES and ICP-MS background correction	s applied?	(Yes/No)		YES
application	e raw data generated before of background corrections?		(Yes/No)		<u>NO</u>
Comments:					
****				19-7	
I certify that th	nis data package is in compliance with	the terms and conditi	ons of the cont	ract, both tech	nically and for
and in the com in advance by	for other than the conditions detailed a uputer-readable data submitted on diske USEPA) has been authorized by the L	ette (or via an alterna	te means of ele	ctronic transm	ission, if approved
following sign	ature.	•			
Signature:	(b) (4)	Name: (b) (4)(b) (4	<del>!</del> )		
Date:	Jal 16/98	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: <u>Presence</u>/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		9/10/08	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

Region III ESAT RPO (3EA20)

TO

: Christine Wagner

Regional Project Manager (3HS32)

Attached is the inorganic data validation report for the Battlefield ( 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

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 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)

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 ± 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

ANALYTE B	SAMPLES AFFECTED MC02J6	POSITIVE VALUES J	NON- DETECTED <u>VALUES</u>	BIAS	COMMENTS* > 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%)

<sup>\*</sup> See explanation of comments in Table 1B

# TABLE 1B CODES USED IN COMMENTS COLUMN

MDL <crql< th=""><th>=</th><th>Reported results are between MDL and CRQL and are considered estimated.</th></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)

SDG (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.: CHEM

Number of Soil Samples: 0
Number of Water Samples: 6

Sample Number :	CHIEF COLUMN TO SERVICE AND SE	(b) (6)	CECCECTYESE	(b) (6)	***********	(b) (6)	222244	(b) (6)		(b) (6)	
Sampling Location :		(b) (6)(b) (6	6)	(b) (6)(b) (6	6)	(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	
Field QC						Dup of (b) (6		Dup o(b) (6)			_
Matrix :		Water		Water		Water		Water		Water	COODON
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	2000
Date Sampled :		8/25/2008		8/28/2008		8/29/2008		8/29/2008		8/29/2008	2000000
Time Sampled :		09:27		10:29		11:19		11:19		11:30	9,000
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	COCOCOCO
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Resuit	Flag	Result	Flag
ALUMINUM	200										
BORON	50	193		380		108		107		137	
CALCIUM '	5000	25300		116000		43100		44000		33400	
IRON	100	156		778		1230		223		5740	
MAGNESIUM	5000	16400		8380		11000		11000		9130	
MOLYBDENUM	5										
MERCURY	0.2		UL		UL		UL		UL		UL
POTASSIUM	5000	12800		3490	J	6970		7190		3740	J
SODIUM	5000	145000	J	42200	J	51100	J	52800	J	113000	J

Sample Number :		(b) (6)	**************************************		**********	-			**********		
Sampling Location :		(b) (6)(b) (t	<b>6</b> )								
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
ALUMINUM	200							61			
BORON	50	4.4	J								
CALCIUM	5000	37800									
IRON	100	17300								,	
MAGNESIUM	5000	22600									
MOLYBDENUM	5										
MERCURY	0.2		UL					100	1		
POTASSIUM	5000	2260	J								No.
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)

# Appendix C

**Chain-of-Custody Records** 

\$EP	
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Case No: DAS No:

Region: Project Code:	3			Date Shipped: Carrier Name:	9/2/2008 FadEv		Chai	n of Custody R	lecord		Sampler Signature:	Til Chished
Account Code:	CT4354			Carrier Name:	FedEx 9619429779	<b>37</b> 4	Relina	quished By	(Date /	Time)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	ChemTech		1	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
Spill ID:	ALM				Group (CHE	EMED)	2.					
Site Name/State:	Battlefield (			tti interessor	284 Sheffiel Mountainsic	d Street le NJ 07092	<u> </u>				ļ	
Project Leader:	Erik Armist Preliminary		ent	utilizations:	(908) 789-8		3.					
Sampling Co:	Tetra Tech						4.					
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG i PRESERVATI		STATION LOCATION	kanasananing		COLLECT E/TIME		GANIC PLE No.	QC Type
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 90 (2)	2 (HNO3)	BG08-GW-MP	12	S: 8/28/2008	13:05		A	will storic de
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 90 (2)	3 (HNO3)	BG08-GW-MP	13	S: 8/28/2008	13:25			in the state of th
MC02B4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	<b>790</b> (HNO3), 90 (2)	4 (HNO3)	BG08-GW-MW	01	S: 8/29/2008	15:55			rech greatest
,	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 90 (2)	5 (HNO3)	BG08-GW-MW	02	S: 8/29/2008	13:50			1616 AES
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 90 (2)	6 (HNO3)	BG08-GW-MW	)2D	S: 8/29/2008	13:50			need appropria
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 90 (2)	7 (HNO3)	BG08-GW-MW	03	S: 8/29/2008	14:50			
	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	<b>79</b> 4 (HNO3), 90 (2)	8 (HNO3)	BG08-SW-SW	01	S: 8/29/2008	12:51	C	) reci	9/17-1000 Rep
	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 90 (2)	9 (HNO3)	BG08-SW-SW	02	S: 8/29/2008	15:40			McOasa ICP-A
- / ( - /	Potable Well/ Erik Armistead	M/G 《	TAL TM+B+M (13)	796 (PINO3) (1)		(b) (6)(b) (6)	ı	S: 8/25/2008	9:27			1 000 1 00 1 1 1 1
- / ( - /	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	<b>797</b> (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	9:59			
- / ( - /	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:	an pinantakan pinantakan kanan k	Additional Sar	mpler Signature(s):					Chain of Custod	y Seal Number:
Analysis Key:	Concentr	ation:	_ = Low, M = Low/Medium, H	= High	Type/Design	ate: Composite = C,	Grab =	G			Shipment Iced?	

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.



-37877 37813 Case No: DAS No:

Region: Project Code:	3 CT4354			Date Shipped:	9/2/2008 FedEx		Cha	in of Custody R	ecord		Sampler Signature:	eil auntis
Account Code:	U 1 +354			Airbill:	961942977	974.	Relin	nquished By	(Date / T	fime)	Received By	(Date / Time)
CERCLIS ID:	VAN0003066	614		Shipped to:	ChemTech		16	5. 1. 10 - A	al-	08 1700		
Spill ID:	ALM			empped to.	Group (CHE		FZ	W Christ	T 119	00 1/00	<u> </u>	
Site Name/State:	Battlefield G	AV\log			284 Sheffie	eld Street	2.			i		
Project Leader:	Erik Armiste			tampequititi	Mountainsid (908) 789-8	de NJ 07092 3900	3.			1	· .	
Action:	Preliminary	Assessm	ent	d	(200) /08-6		I					
Sampling Co:	Tetra Tech I	EM Inc.					4.	Warrange of the Control of the Contr	200000000000000000000000000000000000000			
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG N PRESERVATI		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	QC Type
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	777 (HNO3), 89 (2)	1 (HNO3)	BG08-GW-MP0	'0 <i>‡</i>	S: 8/28/2008	12:40			englannessengeleise transpo <sub>rter</sub> og englannessen og englannessen og englannessen og englannessen og englannessen – •
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	778 (HNO3), 892 (2)	2 (HNO3)	BG08-GW-MP0	'02	S: 8/29/2008	11:15			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	779 (HNO3), 893 (2)	3 (HNO3)	BG08-GW-MP0	'03	S: 8/29/2008	10:00			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	780 (HNO3), 894 (2)	4 (HNO3)	BG08-GW-MP0	'04	S: 8/28/2008	14:06			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	781 (HNO3), 895 (2)	5 (HNO3)	BG08-GW-MP0	05	S: 8/28/2008	15:50			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	782 (HNO3), 896 (2)	6 (HNO3)	BG08-GW-MP0	06	S: 8/28/2008	17:47			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	783 (HNO3), 897 (2)	7 (HNO3)	BG08-GW-MP0	07	S: 8/28/2008	18:10			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	784 (HNO3), 898 (2)	8 (HNO3)	BG08-GW-MP0	80	S: 8/29/2008	9:10			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	785 (HNO3), 899 (2)	9 (HNO3)	BG08-GW-MP0	09	S: 8/29/2008	10:50			<i>a.</i>
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	786 (HNO3), 900 (2)	0 (HNO3)	BG08-GW-MP1	10	S: 8/29/2008	11:50			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	787 (HNO3), 90°(2)	1 (HNO3)	BG08-GW-MP1	11	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		Shipment Iced?
TAL DM+B+M = TAL Di	ss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron	+ Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly	



Case No: DAS No:

Region: Project Code: Account Code: CERCLIS ID: Spill ID: Site Name/State: Project Leader: Action: Sampling Co:	ALM Battlef Erik A Prelim	54 00306614 field Golf/VA rmistead ninary Assessr Tech EM Inc.	nent	Date Shipped: Carrier Name: Airbill: Shipped to:	9/2/2008 FedEx 96194297797 ChemTech C Group (CHEM 284 Sheffield Mountainside (908) 789-896	onsulting MED) Street NJ 07092		of Custody R	ecord (Date / 1	rime)	Sampler Signature:	(Date / Time)
INORGANIC SAMPLE No.	MATR SAMPL		ANALYSIS/ TURNAROUND	TAG I PRESERVATI		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	QC Type
(b) (6)	Potable We Erik Armiste		TAL TM+B+M (14)	855 (HNO3) (1)		(b) (6)(b) (6)		S: 8/27/2008	16:13			
(b) (6)	Potable We Erik Armiste		TAL TM+B+M (14)	856 (HNO3) (1)		(b) (6)(b) (6)		S: 8/28/2008	9:45			*-
(b) (6)	Potable We Erik Armiste		TAL TM+B+M (14)	857 (HNO3) (1)		(b) (6)(b) (6)	9	6: 8/28/2008	10:23			
(b) (6)	Potable We Erik Armiste		TAL TM+B+M (14)	858 (HNO3) (1)		(b) (6)(b) (6)	5	S: 8/28/2008	10:29			**
(b) (6)	Potable We Erik Armiste		TAL TM+B+M (14)	859 (HNO3) (1)		(b) (6)(b) (6)	<b>.</b>	S: 8/29/2008	11:19			
(b) (6)	Potable We Erik Armiste		TAL TM+B+M (14)	860 (HNO3) (1)		(b) (6)(b) (6)	9	S: 8/29/2008	11:19			
(b) (6)	Potable We Erik Armiste		TAL TM+B+M (14)	861 (HNO3) (1)		(b) (6)(b) (6)	<b>S</b>	8: 8/29/2008	11:30			
(b) (6)	Potable We Erik Armiste		TÁL TM+B+M (14)	862 (HNO3), (1)	,	(b) (6)(b) (6)	9	8: 8/28/2008	11:13			
MC02J7	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	863 (Ice Only), 8 Only) (2)	364 (Ice	BG08-SS-MP0	01 5	3: 8/25/2008	10:18			
MC02J8	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	865 (Ice Only), 8 Only) (2)	366 (Ice	BG08-SS-MP0	02 5	3: 8/25/2008	11:35			
MC02J9	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	867 (Ice Only), 8 Only) (2)	368 (Ice	BG08-SS-MP0	)3 S	8: 8/25/2008	12:15			
Shipment for Case Complete? Y	San	nple(s) to be use	d for laboratory QC:		Additional Samp	oler Signature(s):		s ethioppheasann ann ann as eo as fail spèideil faill bhi		l c	Chain of Custody	Seal Number:
	PER CONTRACTOR CONTRAC		`							`		
Analysis Key:		ncentration:	L = Low, M = Low/Medium, F		Type/Designat						Shipment Iced?	
TAL DM+B+M =	TAL DISS M	etals+Boron+N	Moly, TAL Met+B+ = TA	L Metals + Boron	+ Molybdenum	n, TAL TM+B+M =	AL Tota	al Metals+Boro	n+Moly			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs. TR Number:

# U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF#

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D	7	ं	1	. ,	:

Date: 8/21/2008	Site Activity: Removal Assessment									
Site Name: Battlefield	d Golf Club			Street A	Address: 1001 South C	enterville Turnpike				
City: Chesapeake			State: VA	Latitud	le: 36.68982		Longitude: 76.17790			
Program: Superfund		Acct. #: 2008T03 N 30	2DC6C	A3LM RS00	306614					
Site ID:		Spill ID: A3LM								
Site Specific QA Plan	Submitted:	No XY	es Title: Battlefield Go	olf Club I	Fly Ash Assessment SA	AP	Date Approved: 8/20/2008			
EPA Project Leader:	CHRIS WAGNE	R	Phone#:		Cell Phone #: 804-33	37-3049	E-mail: Wagner.Christine@epa.gov			
Request Preparer: JOS	SHUA COPE		Phone#: 610-364-2	2130	Cell Phone #: 215-7	68-8114	E-mail: Joshua.cope@ttemi.com			
Site Leader: ERIK AI	RMISTEAD		Phone#: 610-364-2	2151	Cell Phone #: 267 44	46 2837	E-mail: Erik.armistead@ttemi.com			
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lorr	ie Murra	ny/Karen Wodarczyk					
#Samples 30-35	Matrix: soil		Parameter: TAL M	1etals + 1	Boron + Molybdenum	Method: ILM05.4 ICPAES+Hg				
#Samples 20-25	Matrix: ground	lwater	Parameter: TAL M	letals + I	Boron + Molybdenum -	Method: ILM05.4 ICPAES+Hg				
#Samples 90-110	Matrix: potable	e water	Parameter: TAL m	etals Lo	w(w/o Al,Ca,Fe,K,Mg,	Method: ILM05.4 ICPMS & Hg				
#Samples 90-110	Matrix: potable	e water	Parameter: Al, Ca,	Fe, K, N	Mg, Na	Method: ILM05.4 ICPAES				
#Samples 20-25	Matrix: ground	lwater	Parameter: TAL m	etals Lo	w(w/o Al,Ca,Fe,K,Mg,	,Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg			
#Samples 20-25	Matrix: ground	lwater	Parameter: Al, Ca,	Fe, K, N	Mg, Na		Method: ILM05.4 ICPAES			
#Samples	Matrix:		Parameter:				Method:			
#Samples	Matrix:		Parameter:				Method:			
Ship Date From: 8/29	/2008	Ship Dat	e To: 9/3/2008	Org. Va	alidation Level		Inorg. Validation Level 1M2			
Unvalidated Data Req	uested: No	⊠ Yes	If Yes, TAT Needed:	24hr	rs 48hrs 72hrs	s □7days ⊠ Other (	(Specify)14 days			
Validated Data Package Due: 14 days 21 days 30days 42 days. Other (Specify)										
Electronic Data Deliverables Required: 🗌 No 🗵 Yes (EDDs will be provided in Region 3 EDD Format)										
Special Instructions: S	Special Instructions: See attached DLs.									

# Appendix D

**Laboratory Case Narrative** 

## USEPA - CLP

## COVER PAGE

Lab Name CHEMTEC	H CONSULTING GROUP	Contract: <u>EPW0604</u>	7			
Lab Code: <u>CHEM</u>	Case No.: <u>37813</u>	NRAS No.: <u>1629.0</u>	·····	SDG	No.: MC02	J2
SOW No.: <u>ILM05.4</u>						
	EPA Sample No.		]	Lab Sam <sub>l</sub>	ole ID	
	MC02C0		_	Z4423-(		
	MC02C0D MC02C0S		-	Z4423-( Z4423-(		<del></del>
,	MC02J2		-	Z4423-0	)1	
,	MC02J3 MC02J4		-	Z4423-0 Z4423-0		
	MC02J5	`	-	Z4423-0	)4	<del></del>
	MC02J6		-	Z4423-0	)3	
			-			
			-			
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			-			
	***************************************		_			
	11444444444444		-			
		•	-			
			-			
	**************************************		-			
					ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correction	ons applied?	(Yes/N	10)	YES	
	CP-MS background correction	ns applied?	(Yes/N	lo)	YES	
If yes, were raw dat application of backs			(Yes/N	lo)	NO	****************
Comments:						
THE "E" QUALI INTERFERENCI	<u>FIERS ON FORM I AND VI</u> E EFFECTS	<u>II FOR SODIUM INI</u>	DICATE	CHEMI	CAL OR PI	HYSICAL
	SUSPECTED DURING THA	T ELEMENT'S ANA	LYSES	ONLY.		
completeness, for other and in the computer-re	package is in compliance with r than the conditions detailed a adable data submitted on disk has been authorized by the L	above. Release of the ette (or via an alternate	data conte means	ntained in of electr	this harded	opy data package ission, if approved
Signature:	(4)	Name: (b) (4)(b) (4)	(b) (4)	) (4)-	_	
Date:	4110108	Title:_(D) (4)(D)	(T)(D	/ ( <del>†</del> /		

## CHEMTECH

284 Sheffield Street Mountainside, NJ 07092

### **SDG NARRATIVE**

USEPA
8DG # 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: <u>Presence</u>/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

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#### 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)
	Jall LA	
Date	9110108	Title: (b) (4)(b) (4)

Received By (Print Name	(b) (4) $(b)$ (4)					Log-in Date 9/4/2008
Received By (Signature)	(D) (4)	NATION CONTINUES	######################################			J/ 1/ 2000
Case Number 37813		Sample Delive	ry Group I	No. MC02J2	NRAS Nun	nber
Remarks:	<u>nogomene miljanen menemenen menemen menemen ja popularing milian melikum melikum melikum menimen menemen menem</u>		uniman manamana kanga	Correspor	AN ARCHITECTURE AND A PROCESSION OF THE PROCESSI	
	A		O CO	1.49		
1. Custody Seal(s)	Present/Absent* Intact/Broken				TO THE PROPERTY OF THE PROPERT	Remarks: Condition of
2. Custody Seal Nos.		EPA Sample	Aqueous Sample		Assigned	Sample shipment,
Traffic Reports/Chain Of Custody Reports or	Present Absent*	#	pH	Sample Tag #	Lab #	etc.
Packing Lists		MC02J2	NA	858	Z4423-01	intra
4. Airbill	Airbill/Sticker	MC02J3		859	Z4423-02	
	Present/Absent* 961992977979	MC02J4		. 860	Z4423-03	
5. Airbill No.	70177077777	MC02J5		. 861	Z4423-04	
6. Sample Tags Sample	resent/Absent*	MC02J6	1	. 862	Z4423-05	
Tag #	On TR/Chain-of-Custody	MC02C0		. 796	Z4423-06	
7 Cample Condition	Intact/Broken*/Leaking	MC02C0D		. 796	Z4423-07	
7. Sample Condition  8. Cooler Temperature	Present/Absent*	MC02C0S	W	. 796	Z4423-08	4
Indicator Bottle  9. Cooler Temperature	4°C					
10. Does information on custody records, traffic reports, and	res/No*	METER HERVOORI IS HIT HIS HIS HIS HOUSE AND				
sample tags aggree?			<u> </u>	/		
11. Date Received at Lab	9.3.08 9:30					
12. Time Received	9:30					_
Sample	Transfer			99/16/0	8	
Fraction METALS	Fraction			and the second s	ACCHAINN A THE WAY A STATE A STATE AS A STAT	7
Area # Q53	Area # ( g/14%			<u> </u>		1
By chris	By				Manual Control of the	ence.
On 9-16-08	98			er gegenstende se stadent geget may ford en forme so bedeligt for else Albert Materilles and Bedelic Construction		
				Annay was salahang gaza arang saza salahang saza salahang saza salah	AMPOINT COMMAND THE PROPERTY OF THE PROPERTY O	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
* Contact SMO and atta	ch record of resolution			(b) (4		
Reviewed By (b) (4)	poda ne kolja kontroj e jegovojno 110.0000 rodo ini po disektokom kladicenju veto 11112 gran u se sosoon		ogbook N	0.		nany by the second seco
Date 9-/6-08	er sakka kunut ser mismak merutat derbassi kandenbendari bat betrankt derbas tanda til annan sama sama b	ĮL	ogbook Pa	age No.	716/08	EONANO (SE SESSO SE ESTA SE ES

#### 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)
В	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		l l - u-l u - u	Drallminan	205	(A)	Cost For Modified Analysis		
	Modification Reference Number  Hardcopy Turnaround Requirement		Preliminary Results (Y/N)	PDF Delivery (Y/N)	Estimated No. of Samples by Matrix (including billable QC)	(B) New Per Sample Price	(A × 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	\$	

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

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₽	ro	iect	In	for	ma	tion

Estimated Shipping Period:

8/29/2008 through 9/3/2008

Additional Information:

Please note that the samples will ship under two Cases.

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: Signature of USEPA Contracting Officer:

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

Region III ESAT RPO

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

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 3, 2008

Subject:

Inorganic Data Validation (IM2 Level)

Case: 37813 SDG: MC02J3

Site: Battlefield Golf Club

From:

(b) (4) (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
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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

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED <u>VALUES</u>	BIAS	COMMENTS*
Sb	MC02J2, MC02J3, MC02J4, MC02J5	В		High	CCB (0.320 J ug/L)
As ,	MC02J3, MC02J6	В		High	CCB (0.283 J ug/L)
Cr	MC02C0, MC02J2, MC02J4	В		High	CCB (0.153 J ug/L)
Со	MC02J3, MC02J6	В		High	CCB (0.103 J ug/L)
Se	All samples		UL	Low	CBN (-0.220 J ug/L)
Ag	All samples except MC02C0	В		High	CCB (0.087 J ug/L) >MDL <crql MSL (49%)</crql 
	MC02C0		UL	Low	MSL (49%)
Tl	MC02J3	В		High	CCB (0.100 J ug/L)
V	MC02C0, MC02J3, MC02J4	В		High	CCB (0.217 J ug/L)

<sup>\*</sup> 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 ≤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</li>
 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

SDG : (b) (6)

BATTLEFIELD GOLF CLUB

Number of Soil Samples: 0 Number of Water Samples: 6

Site : 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)			SOURCE
Matrix:		Water		Water		Water		Water	•	Water	200000
Units:		ug/L		ug/L		ug/L		ug/L		ug/L	5000000
Date Sampled :		8/25/2008		8/28/2008		8/29/2008		8/29/2008		8/29/2008	00000
Time Sampled :		09:27		10:29		11:19		11:19		11:30	90000
Dilution Factor :		1.0	***********	1.0		1.0		1.0	GONTENENCE	1.0	gaururranus (
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2			0.44	В	1.2	В	0.23	В	0.22	В
*ARSENIC	1	1.5		1.6		1.4	В	1.6		1.5	00000
BARIUM	10	1.5	J	27.9		77.9		77.0		84.1	
BERYLLIUM	1					arcaro de la companya				0.11	J
*CADMIUM	1			0.16	J	0.13	J				
*CHROMIUM	2	0.60	В	0.76	В	0.82	J	0.74	В	0.90	J
COBALT	1					0.14	В				
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	В	0.067	В	0.050	В	0.047	В
THALLIUM	1					0.11	В				
VANADIUM	5	0.89	В	1.4	J	0.64	В	0.99	В	1.3	J
ZINC	2	21.4		31.2		17.4		16.8	İ	140	

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

SDG: (b) (6)

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

Sample Number :	***************************************	(b) (6)			**********		0.2242		************		
Sampling Location :		(b) (6)(b) (6									
Matrix:		Water									0000000
Units:		ug/L						0000000			
Date Sampled :		8/28/2008						800000			
Time Sampled :		11:13									o de la composición della comp
Dilution Factor :		1.0									
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.4	В						DOCUM		5500000
BARIUM	10	14.0									
BERYLLIUM	1								00000000		00000000
*CADMIUM	1										
*CHROMIUM	2	1.9	J			in .	or constant		acoracas a		2000
COBALT	1	0.14	В								
COPPER	2	54.4					00000		Regerato		
*LEAD	1	6.4									
MANGANESE	1	261									
*NICKEL	1	1,1									
SELENIUM	5		UL	500 Trans					0000000		200000
SILVER	1	0.040	В								
THALLIUM	1						900000				
VANADIUM	5	1.2	J								
ZINC	2	1360					SOURCE		2000		

CRQL = Contract Required Quantitation Limit \*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

Appendix C
Chain of Custody Records



# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

<del>37814</del>37813 Case No: DAS No:

Region: Project Code: .	3			Date Shipped:	9/2/2008		Cha	in of Custody R	ecord		Sampler Signature:	I Chistres
Account Code:	CT4354			Carrier Name: Airbill:	FedEx 9619429779	974	Relin	quished By	(Date / Tir	ne)	Received By	(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	ChemTech		1					
Spill ID:	ALM			Group (CHEMED)		2.		······································				
Site Name/State:	Battlefield (			discount	284 Sheffie Mountainsic	ld Street de NJ 07092	۵.				, , , , , , , , , , , , , , , , , , , ,	
Project Leader: Action:	Erik Armiste Preliminary		ont	•	(908) 789-8		3.					
Sampling Co:	Tetra Tech		ent				4.					
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG PRESERVAT		STATION LOCATION	Secretary 1991		COLLECT E/TIME		I GANIC PLE No.	QC Type
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	788 (HNO3), 90 (2)	)2 (HNO3)	BG08-GW-MP	'12	S: 8/28/2008	13:05			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	789 (HNO3), 90 (2)	3 (HNO3)	BG08-GW-MP	13	S: 8/28/2008	13:25			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	790 (HNO3), 90 (2)	)4 (HNO3)	BG08-GW-MW	/01	S: 8/29/2008	15:55			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	791 (HNO3), 90 (2)	)5 (HNO3)	BG08-GW-MW	/02	S: 8/29/2008	13:50			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	792 (HNO3), 90 (2)	)6 (HNO3)	BG08-GW-MW	02D	S: 8/29/2008	13:50			
	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	793 (HNO3), 90 (2)	)7 (HNO3)	BG08-GW-MW	/03	S: 8/29/2008	14:50			
	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	794 (HNO3), 90 (2)	)8 (HNO3)	BG08-SW-SW	<b>′</b> 01	S: 8/29/2008	12:51			••
	Surface Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	795 (HNO3), 90 (2)	9 (HNO3)	BG08-SW-SW	02	S: 8/29/2008	15:40			
()	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	796 (HNO3) (1)		(b) (6)(b) (6)		S: 8/25/2008	9:27			
	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	797 (HNO3) (1)		(b) (6)(b) (6)	•	S: 8/25/2008	9:59			
( - ) ( - )	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 Sa	mpler Signature(s):					Chain of Custody S	eal Number:
Analysis Key:	Concentr	ation:	L = Low, M = Low/Medium, F	l = Hioh	Type/Design	nate: Composite = C.	Grab =	: G			Shipment Iced?	
• •	1		foly, TAL Met+B+ = TA		• • • • • • • • • • • • • • • • • • • •				n+Moly			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

F2V5.1.047 Page 2 of 10

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

T	Amon Par	A
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# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No:

<del>37814</del> 37813

DAS No

					BAO IVO.		anticono con con con con con con con con con
Region:	3	Date Shipped:	9/2/2008	Chain of Custody Rec	ord	Sampler Signature:	Minder
Project Code:	CT4354	Carrier Name:	FedEx			1/10	During.
Account Code:		Airbill:	961942977974,	Relinquished By	(Date / Time)	Received By	(Date / Time)
CERCLIS ID:	VAN000306614	Shipped to:	ChemTech Consulting	1			
Spill ID:	ALM		Group (CHEMED) 284 Sheffield Street Mountainside NJ 07092 (908) 789-8900	<u> </u>			
Site Name/State:	Battlefield Golf/VA			2.			
Project Leader:	Erik Armistead			3.			
Action:	Preliminary Assessment		(000) 700 0000			ļ	
Sampling Co:	Tetra Tech EM Inc.			4.			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION		ECOLLECT E/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	100000007799000000000000000000000000000	
(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		bi s
(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		<b>u</b> -

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 Di	ss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron	+ Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly	

TR Number:

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)

## U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4353 Analytical TAT

DAS# 14

NSF#

378/3

Date: 8/21/2008	-	Site Activ	ity: Removal Assessm	ent				
Site Name: Battlefield	l Golf Club			Street A				
City: Chesapeake			State: VA	Latitud	le: 36.68982		Longitude: 76.17790	
Program: Superfund			Acct. #: 2008T03 N 3	02DC6C	A3LM RS00	CERCLIS #: VAN000	306614	
Site ID:			Spill ID: A3LM			Operable Unit:		
Site Specific QA Plan	Submitted:	] No ⊠Y	es Title: Battlefield G	olf Club I	Fly Ash Assessment SA	ΛP	Date Approved: 8/20/2008	
EPA Project Leader:	CHRIS WAGNE	R	Phone#:		Cell Phone #: 804-33	37-3049	E-mail: Wagner.Christine@epa.gov	
Request Preparer: JOS	SHUA COPE		Phone#: 610-364-	-2130	Cell Phone #: 215-76	58-8114	E-mail: Joshua.cope@ttemi.com	
Site Leader: ERIK AI	RMISTEAD		Phone#: 610-364-	-2151	Cell Phone #: 267 44	16 2837	E-mail: Erik.armistead@ttemi.com	
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lor	rie Murra	ay/Karen Wodarczyk			
#Samples 30-35	Matrix: soil Parameter: TAL			Metals + 1	Boron + Molybdenum -	+ Hg CHEM	Method: ILM05.4 ICPAES+Hg	
#Samples 20-25	Matrix: groundwater Parameter: TAL			Metals + I	Boron + Molybdenum -		Method: ILM05.4 ICPAES+Hg	
#Samples 90-110	Matrix: potable water Parameter: TAL			netals Lo	w(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg	
#Samples 90-110	Matrix: potabl	e water	Parameter: Al, Ca	ı, Fe, K, N	Mg, Na		Method: ILM05.4 ICPAES	
#Samples 20-25	Matrix: ground	lwater	Parameter: TAL r	netals Lo	w(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg	
#Samples 20-25	Matrix: ground	lwater	Parameter: Al, Ca	ı, Fe, K, N	Mg, Na		Method: ILM05.4 ICPAES	
#Samples	Matrix:		Parameter:				Method:	
#Samples	Matrix:		Parameter:				Method:	
Ship Date From: 8/29	/2008	Ship Da	te To: 9/3/2008	Org. Va	alidation Level		Inorg. Validation Level IM2	
Unvalidated Data Req	uested: No	⊠ Yes	If Yes, TAT Needed	: 🗌 24hı	rs 🗌 48hrs 📗 72hrs	☐7days ☐ Other	(Specify)14 days	
Validated Data Packag	ge Due: 🔲 14 d	ays <u> </u>	days 🛛 30days 🔲	42 days	Other (Specify)			
Electronic Data Delive	rables Required:	☐ No	Yes (EDDs will b	e provide	ed in Region 3 EDD Fo	rmat)		
Special Instructions: S	ee attached DLs.							
						•		

Appendix D

Laboratory Case Narrative

### USEPA - CLP

#### **COVER PAGE**

Lab Name CHEMTEC	H CONSULTING GROUP	Contract: EPW06047			
Lab Code: <u>CHEM</u>	Case No.: <u>37813</u>	NRAS No.:	S	DG No.: MC02	J3
SOW No.: ILM05.4	4				
	EPA Sample No.		Lab S	Sample ID	
	MC02C0		Z44	27-06	
	MC02C0D			27-07	_ `
	MC02C0S		-	27-08	<del></del> .
	MC02J2 MC02J3			27-02 27-01	<del></del>
,,	MC02J4			27-03	<del></del>
•	MC02J5			27-04	*****
	MC02J6		Z44	27-05	
		*			
	-				<del></del>
					*****
					********
					*****
			***************************************		
					<del>_</del>
			<del></del>		
				YOR A FO	10D 110
				ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correction	ns applied?	(Yes/No)		<u>YES</u>
	CP-MS background correction	ns applied?	(Yes/No)		YES
If yes, were raw dat application of back	ta generated before ground corrections?	•	(Yes/No)		NO
Comments:	<i>G</i> · · · · · · · · · · · · · · · · · · ·				
completeness, for other and in the computer-re	package is in compliance with r than the conditions detailed adable data submitted on disk ) has been authorized by the L	above: Release of the ette (or via an alterna	e data contain te means of e	ed in this harded lectronic transm	ppy data package ission, if approved
Signature:	(4)	Name: (b) (4)(b) (4	4)		
Date:	11000	Title: (b) (4)(b) (4			
Date.	TUTY V	1166. <mark>(D) (4)(D) (4</mark>	/( <del>b</del> ) ( <del>4</del> )		

#### 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 (AI, 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 1<sup>st</sup> container and use the 2<sup>nd</sup> 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.

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).

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
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	4)	Name: (b) (4)(b) (4)
Date	9	110/68	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 (Case # 37813 SDG #MC02 TA) 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

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 2, 2008

SUBJECT:

Inorganic Data Validation (IM2 Level)

Case: 37813 SDG: MC02J7

Site: Battlefield Gold Club

FROM:

(b) (4)(b) (4) (b) (d) (c) (d)

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.

Blank Affected Analytes

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

ANALYTE	SAMPLES <u>AFFECTED</u>	POSITIVE VALUES	NON- DETECTED <u>VALUES</u>	BIAS	COMMENTS*
В	All Samples Except MC02K4, MC02K6	В		High	PB (0.818 J mg/Kg)
Ca	MC02J8, MC02K0, MC02K2, MC02K4, MC02K7, MC02K8	В		High	RB (527 J μg/L)
Cu	MC02J8, MC02K0, MC02K4	В		High	CCB (2.520 J µg/L)
Mg	MC02K7	В		High	RB (116 J μg/L)
Mn	MC02K7, MC02K8	В		High	RB (8.0 J µg/L)
Mo	MC02K5, MC02K6, MC02K7	В		High	CCB (2.545 J µg/L)
Hg	MC02K5, MC02K9	В		High	CCB (0.083 J µg/L)
Ni	MC02J8, MC02K0, MC02K2, MC02K4, MC02K7, MC02K8	В		High	CCB (5.750 J µg/L)
Ag	All Samples		UL	Low	MSL (69%)
T1	All Samples		UL	Low	MSL (61%)

<sup>\*</sup> 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 ≤5X the blank concentration may be biased high.

RB = Rinsate blank had results >MDLs [results are in parenthesis]. Positive results which are ≤5X the blank concentrations may be biased high.

CCB = Continuing calibration blanks had results >MDLs [results are in parenthesis]. Positive results which are ≤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

SDG: MC02J7

Site:

BATTLEFIELD GOLF CLUB

Number of Soil Samples: 13 Number of Water Samples: 0

Lab.:

CHEM

Sample Number :	***************************************	MC02J7	***********	MC02J8		MC02J9	***************************************	MC02K0		MC02K1	
Sampling Location :	BG08-SS-MP01		BG08-SS-MP02 B		BG08-SS-MP03		BG08-SS-M	P04	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	000000
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	В	1.1	В	2.0	В	0.98	В	3.3	В
CADMIUM	0.5		********************		Man 100 100 100 100 100 100 100 100 100 10	The training of the same of th					airean ribertannan
CALCIUM	500	814		255	В	407	J	151	В	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	В	3.3		0.60	В	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	В	5.5		1.3	В	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)

SDG: MC02J7

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

Sample Number :	***************************************	MC02K2		MC02K3	*********	MC02K4	CCAPILLELLE	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		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	0000000
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	giji ji
%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	В	2.3	В			5.1	В	5.6	J.
CADMIUM	0.5	0.067	J								
CALCIUM	500	197	В	962		193	В	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	В	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	tion our and annies of a	17.9		8.7		41.5		40.9	
MOLYBDENUM	0.5	e Bargari						0.60	В	1.5	В,
MERCURY	0.1							0.065	В		
NICKEL	4	3.3	В	9,4		1.4	В	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	<u></u>	27.2	<u>.                                    </u>

CRQL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRQL \* Dilution Factor) / (%Solids/ 100)

SDG: MC02J7

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

Sample Number :		MC02K7	***********	MC02K8	************	MC02K9			**********		
Sampling Location :	Sampling Location :			BG08-SS-MP12 BG08-SS-MI		P13					
Matrix :	Soil		Soil	Soil		Soil					
Units:		mg/Kg		mg/Kg		mg/Kg					990000
Date Sampled :		8/26/2008		8/26/2008		8/26/2008					000000
Time Sampled :		09:36		10:20		11:10					
%Solids :		79.5		76.6		74.8					9
Dilution Factor :		1.0		1.0		1.0		****			Z. O.
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM /	20	631		1010		11800					
ANTIMONY	6				•			47			
ARSENIC	1	0.49	J			. 2.2					
BARIUM .	20					30.6					
BERYLLIUM	0.5					0.42	J				
BORON	5	1.0	В	1.0	В	1.7	В				
CADMIUM	0.5										
CALCIUM	500	81.3	В	77.6	В	401	J				
CHROMIUM	1	1.5		1.8		10.9					
COBALT	5	0.76	j	10000		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	В	91,4	J	449	J				
MANGANESE	1.5	4.4	В	3.6	В	10.5					
MOLYBDENUM	0.5	0.28	В								
MERCURY	0.1					0.098	В				
NICKEL	4	1.2	В	1.1	В	4.5	J				
POTASSIUM	500					232	J				
SELENIUM	3.5	0.58	J	0.72	J	1.1	J				
SILVER	1		UL		UL		UL	***************************************		W0000000000000000000000000000000000000	
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)

# Appendix C

Chain-of-Custody Records

₩.E	PA
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# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No:

27814 3 7813

DAS No:

Region: Project Code: Account Code: CERCLIS ID: Spill ID: Site Name/State: Project Leader:	Erik Armi	d Golf/VA stead		Date Shipped: Carrier Name: Airbill: Shipped to:	9/2/2008 FedEx 9619429779 ChemTech ( Group (CHE 284 Sheffield Mountainsidi (908) 789-88	Consulting (MED) d Street e NJ 07092		a of Custody R	ecord (Date / Ti	me)	Signature: Received By	(Date / T	MA (ime)
Action: Sampling Co:		ry Assessm ch EM Inc.	ent				4.					<del></del>	
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG PRESERVAT		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.	QC Type	-NY
(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)	ı	(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)	<b>(6)</b>	S: 8/29/20Ó8	11:19				
(b) (6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	861 (HNO3) (1)	i	(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)	<u>.</u>	(b) (6)(b) (6)		S: 8/28/2008	11:13				
MC02J7	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	863 (Ice Only), Only) (2)	864 (Ice	BG08-SS-MP	01	S: 8/25/2008	10:18				
MC02J8	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	865 (Ice Only), Only) (2)	866 (Ice	BG08-SS-MP	02	S: 8/25/2008	11:35				
MC02J9	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	867 (Ice Only), Only) (2)	868 (Ice	BG08-SS-MP	03	S: 8/25/2008	12:15				
Shipment for Case Complete? Y	Sample	e(s) to be used	for laboratory QC:		Additional San	npler Signature(s):					Chain of Custody S	eal Number:	(1,177,682,177,613,152, <u>2</u> 2))
Analysis Key:	Conce	ntration:	L = Low, M = Low/Medium, H	H = High	Type/Designa	ate: Composite = C.	Grab = C	3	<u></u>		Shipment Iced?		
TAL DM+B+M =	TAL Diss Meta	ls+Boron+N	loly, TAL Met+B+ = TA	L Metals + Boror	n + Molybdenui	m, TAL TM+B+M =	TAL TO	tal Metals+Boro	n+Moly				
						the state of the s				Mary Control of the C			

TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

E	P	A

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

		m
Case No:	3781437813	R
DAS No:	(EA)	

Region: Project Code: Account Code: CERCLIS ID: Spill ID: Site Name/State Project Leader: Action: Sampling Co:	ALM Battlef Erik A Prelim	54 00306614 field Golf/VA krmistead ninary Assess Tech EM Inc	sment	Group (CH 284 Sheffi	n Consulting IEMED) eld Street ide NJ 07092	Chain of Custody I Relinquished By  1 2. 3.	(Date / Tin	Sampler Signature:	id dunt of (Date / Time)
INORGANIC SAMPLE No.	MATR SAMPL			TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION		E COLLECT FE/TIME	ORGANIC SAMPLE No.	QC Type
MC02K0	Soil (>12")/ Erik Armiste		TAL Met+B+ (14)	869 (Ice Only), 870 (Ice Only) (2)	BG08-SS-MP0	04 S: 8/25/2008	13:24		
MC02K1	Soil (>12")/ Erik Armiste		TAL Met+B+ (14)	871 (Ice Only), 872 (Ice Only) (2)	BG08-SS-MP0	05 S: 8/25/2008	14:15		and and
MC02K2	Soil (>12")/ Erik Armiste		TAL Met+B+ (14)	873 (Ice Only), 874 (Ice Only) (2)	BG08-SS-MP0	06 S: 8/25/2008	15:07		
MC02K3	Soil (>12")/ Erik Armiste		TAL Met+B+ (14)	875 (ice Only), 876 (ice Only) (2)	BG08-SS-MP0	97 S: 8/25/2008	15:57		<u></u>
MC02K4	Soil (>12")/ Erik Armiste		. TAL Met+B+ (14)	877 (Ice Only), 878 (Ice Only) (2)	BG08-SS-MP0	08 S: 8/25/2008	17:10		
MC02K5	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	879 (Ice Only), 880 (Ice Only) (2)	BG08-SS-MP0	9 S: 8/26/2008	8:01		
MC02K6	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	881 (Ice Only), 882 (Ice Only) (2)	BG08-SS-MP1	0 S: 8/26/2008	8:35		•-
MC02K7	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	883 (Ice Only), 884 (Ice Only) (2)	BG08-SS-MP1	1 S: 8/26/2008	9:36		
MC02K8	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	885 (Ice Only), 886 (Ice Only) (2)	BG08-SS-MP1	2 S: 8/26/2008	10:20		
MC02K9	Soil (>12")/ Erik Armiste	M/G ead	TAL Met+B+ (14)	887 (Ice Only), 888 (Ice Only) (2)	BG08-SS-MP1	3 S: 8/26/2008	11:10		
MC02L0	Ground Wat Erik Armiste		TAL TM+B+M (14)	889 (HNO3) (1)	BG08-RB01	S: 8/26/2008	10:15		Rinsate
Shipment for Case Complete? Y	Sarr	iple(s) to be us	ed for laboratory QC:	Additional Sa	ampler Signature(s):			Chain of Custod	y Seal Number:
Analysis Key:	Cor	ncentration:	L = Low, M = Low/Medium, H	H = High Type/Design	nate: Composite = C, (	Grab = G		Shipment Iced?	
TAL DM+B+M =	TAL DISS Me	etals+Boron+	Moly, TAL Met+B+ = TA	AL Metals + Boron + Molybden	um, TAL TM+B+M = T	AL Total Metals+Boro	n+Moly		

TR Number: TR Number: 3-375524367-090108-0001
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

## U.S. EPA Region III Analytical Request Form

XTE	5 8	25-08
7	ASQAB U	SE 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 Sta			State: VA	Latitude: 36.68982			Longitude: 76.17790	
Program: Superfund		Acct. #: 2008T03 N 30	cct. #: 2008T03 N 302DC6C A3LM RS00 CERCLIS #: VAN000		06614			
Site ID: Sp			Spill ID: A3LM	ill ID: A3LM Opera			Operable Unit:	
Site Specific QA Plan Submitted: No Yes Title: Battlefield Golf Club Fly Ash Assessment SAP						ΛP	Date Approved: 8/20/2008	
EPA Project Leader: CHRIS WAGNER			Phone#:	Phone#: Cell Phone #: 804-3		37-3049	E-mail: Wagner.Christine@epa.gov	
Request Preparer: JOSHUA COPE			Phone#: 610-364-2	-2130 Cell Phone #: 215-768-8114		68-8114	E-mail: Joshua.cope@ttemi.com	
Site Leader: ERIK ARMISTEAD			Phone#: 610-364-2	2151	Cell Phone #: 267 446 2837		E-mail: Erik.armistead@ttemi.com	
Contractor: Tetra Tec		EPA CO/PO: Lorr	EPA CO/PO: Lorrie Murray/Karen Wodarczyk					
#Samples 30-35		Parameter: TAL M	Parameter: TAL Metals + Boron + Molybdenum + Hg CHEM			Method: ILM05.4 ICPAES+Hg		
#Samples 20-25	water	Parameter: TAL M	Parameter: TAL Metals + Boron + Molybdenum + Hg			Method: ILM05.4 ICPAES+Hg		
#Samples 90-110	Matrix: potable	water	Parameter: TAL m	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	Parameter: Al, Ca,	Parameter: Al, Ca, Fe, K, Mg, Na			Method: ILM05.4 ICPAES		
#Samples 20-25	Matrix: ground	Parameter: TAL m	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,	Parameter: Al, Ca, Fe, K, Mg, Na			Method: ILM05.4 ICPAES	
#Samples	Matrix:		Parameter:	Parameter:			Method:	
#Samples	Matrix:		Parameter:	Parameter:			Method:	
Ship Date From: 8/29	Ship Date	e To: 9/3/2008	o: 9/3/2008 Org. Validation Level			Inorg. Validation Level IM2		
Unvalidated Data Requested: No X Yes If Yes, TAT Needed: 24hrs 48hrs 72hrs 72hrs 70hrs 60ther (Specify) 14 days								
Validated Data Package Due: 14 days 21 days 30days 42 days Other (Specify)								
Electronic Data Deliverables Required: No Yes (EDDs will be provided in Region 3 EDD Format)								
Special Instructions: See attached DLs.								

Case #: 37813

SDG: MC02A1

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

### ALL TOTAL METALS

***************************************	MC02B6	**********	MC02B7	*****	MC02B8		MC02B9	executation of the second	MC02L0	
	BG08-GW-M	W02D	BG08-GW-N	/IW03	BG08-SW-S	W01	BG08-SW-S	SW02	BG08-RB01	l
	Dup of MC02	B5							Rinsate Bla	nk
	Water		Water		Water		Water		Water	
	ug/L		ug/L		ug/L		ug/L		ug/L	
	8/29/2008		8/29/2008		8/29/2008		8/29/2008		8/26/2008	
	13:50		14:50		12:51		15:40		10:15	
	1.0		1.0		1.0		1.0		1.0	
CRQL	Result	Flag	Result	Flag	Result	Flag	<ul> <li>Result</li> </ul>	Flag	Result	Flag
200	397		561		403		630			
60										
10	5.8	J	3.4	J						
200	10.11				30.0	J	37.9	J		
5				,	0.59	J	0.55	J		
50	27.5	J	17.4	J	25.6	J	22.1	J		UL
5		UL		UL		UL		UL		UL
5000	72100		59500		19300		24900		376	J
10	1.2	J	1.9	J					`	2000
50	1000				5.6	J	9.2	J		
25							,		,	
100	5380		8030		996	В	1140	В	124	
10	16.1		16.2		4.8	J	1.4	J		UL
5000	20200		18800		7250		8530			
15	123		184		360		358		2.4	J
5		UL		UL		UL		UL		UL
0.2										
40					3.6	J	4.9	J		
5000	1810	J	2590	J	2620	J	4680	J		
35										
10										
5000	32600	J	25000	J	14600	J	23400	J		
25		UL		UL		UL		UL		UL
50			2.8	J						
60	6.5	В	24.1	J	24.7	J	26.0	J	1.9	J
WANNAM WANNAM CONTRACTOR OF THE PROPERTY CONTRAC	200 60 10 200 5 50 5 5000 10 5000 15 5 0.2 40 5000 35 10 5000 25 5000	BG08-GW-M' Dup of MC02 Water ug/L 8/29/2008 13:50 1.0  CRQL Result 200 397 60 10 5.8 200 5 50 27.5 5 500 72100 10 1.2 50 25 100 5380 10 16.1 5000 20200 15 123 5 0.2 40 5000 1810 35 10 5000 32600 25 50	BG08-GW-MW02D Dup of MC02B5 Water ug/L 8/29/2008 13:50 1.0  CRQL Result Flag 200 397 60 10 5.8 J 200 5 UL 5000 72100 10 1.2 J 50 25 100 5380 10 16.1 5000 20200 15 123 5 UL 0.2 40 5000 1810 J 35 10 5000 32600 J 5000 32600 J 25 50 UL 5000 32600 J	BG08-GW-MV02D   BG08-GW-M   Dup of MC02B5   Water   ug/L   8/29/2008   13:50   14:50   1.0	BG08-GW-MV02D   BG08-GW-MV03   Dup of MC02B5   Water   ug/L   8/29/2008   13:50   14:50   1.0   1.0   1.0   1.0	BG08-GW-MW02D Dup of MC02B5 Water ug/L 8/29/2008 8/29/2008 13:50 14:50 12:51 1.0 1.0 1.0 1.0 1.0 1.0 1.2 J 1.9 J 500 255 100 5380 8030 996 10 16:1 123 123 184 360 10 18:10 J 2590 J 2620 35 10 5000 32600 J 2550 UL 5000 32600 J 2550 UL 5000 32600 J 2550 UL 5000 32600 J 2550 UL 5000 32600 J 2550 UL 5000 32600 J 25500 J 25500 J 2620 550 J 2620 550 J 2620 J 2620 550 J 2650 J	BG08-GW-MW02D   Dup of MC02B5   Water   Ug/L   U	BG08-GW-MW02D   BG08-GW-MW03   BG08-SW-SW01   BG09-SW01   BG09-SW0	BG08-GW-MV02D   BG08-GW-MV03   BG08-SW-SW02   BG08-SW-SW02	BG08-GW-MV02D

CRQL = Contract Required Quantitation Limit

\*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

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

Revised 09/99

Case #: 37813

SDG: MC02A1

Site:

BATTLEFIELD GOLF CLUB

Lab.:

CHEM

Sample Number :   BG08-RB02   BG08-RW-SW01   BG08-SW-SW02   BG08-SW02   BG08-SW	Lab.:	CHEM	TOTAL		DISSOLV	/ED	DISSOLV	/ED				
Sampling Location :   BG08-RB02   Rinsate Blank   Water   Water   Water   Ug/L   Ug/	Cample Number	~~~~~	PARTICIPATION AND ADDRESS OF THE PARTICIPATION AND ADDRESS OF THE	*************	THE RESERVE OF THE PERSON NAMED IN	, LU		LU	<u> </u>	******		***************************************
Field QC :   Rinsate Blank   Water   Water   Water   Ug/L   Ug/	•				8	104	8	1400				
Matrix :         Water ug/L ug/L ug/L ug/L ug/L ug/L ug/L ug/L			1		BG08-SW-S	rovv	BG08-SW-S	VVU2				
Units :				•								
Date Sampled :			ŧ						:			
Time Sampled : Dilution Factor : 10.15			· ·		9 -							
Dilution Factor	•				8		9					
ANALYTE CRQL Result Flag Result Flag Result Flag Result Flag Result Flag Result Flag Result Flag Result Flag Result Flag ALUMINUM  ANTIMONY 60			4		R .		H					
ALUMINUM ANTIMONY 60 60 60 5.9 B 60 60 60 60 60 60 60 60 60 60 60 60 60		***************************************			Same and the same and the same and the same and the same and the same and the same and the same and the same a							
ANTIMONY 60 5.9 B		<del>Čenansanasana</del>	Result	*******	***************************************	Flag		Flag	Result	Flag	Result	Flag
**ARSENIC	***************************************			UL	<b>3</b>		478					
BARIUM 200 33.3 J 40.6 J BERYLLIUM 5 0.52 J 0.50 J BERYLLIUM 5 0.52 J 0.50 J D 0.50 J D 0.50 D D 0.50 D D 0.50 D D 0.50 D D 0.50 D D 0.50 D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D D 0.50 D D D 0.50 D D D D 0.50 D D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D D 0.50 D D D 0.50 D D D 0.50 D D D D 0.50 D D D D 0.50 D D D D 0.50 D D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D 0.50 D D D D 0.50 D D 0.50 D D D 0.50 D D D 0.50 D D 0					5.9	В						
BERYLLIUM   5		954400000000000000000000000000000000000		300 colors (100 colors)			Note: construction and an arrangement of the			200000000000000000000000000000000000000		
BORON	BARIUM	200			33.3	J	40.6	J				
**CADMIUM	BERYLLIUM				0.52		0.50	-				
CALCIUM 5000 527 J 18400 23300	BORON	50			34.8	В	30.9	В				
CHROMIUM  COBALT  SO  LOPPER  25  IRON  100  571  665  B  254  B  CHEAD  10  MAGNESIUM  5000  116  J  6520  7510  MARGANESE  MOLYBDENUM  55  MERCURY  0.2  UL  VIL  VIL  VIL  VIL  VIL  VIL  VIL	*CADMIUM	5										
COBALT 50 4.8 J 8.2 J COPPER 25	CALCIUM	5000	527	J	18400		23300					
COPPER         25         665         B         254         B           *LEAD         10         571         665         B         254         B           MAGNESIUM         5000         116         J         6520         7510         C           MANGANESE         15         8.0         J         346         339         C           MOLYBDENUM         5         UL         UL         UL         UL           *NICKEL         40         11.3         J         13.1         J           POTASSIUM         5000         UL         2700         J         4610         J           SELENIUM         35         S         S         S         S         S           SILVER         10         UL         15700         J         24400         J         1           THALLIUM         25         VANADIUM         50         UL         15700         J         24400         J         1	*CHROMIUM	10	•									THE STREET
IRON	COBALT	50			4.8	J	8.2	J				
*LEAD 10 5000 116 J 6520 7510	COPPER	25										
MAGNESIUM         5000         116         J         6520         7510           MANGANESE         15         8.0         J         346         339           MOLYBDENUM         5         UL         UL         UL           MERCURY         0.2         UL         UL         UL           *NICKEL         40         11.3         J         13.1         J           POTASSIUM         5000         UL         2700         J         4610         J           SELENIUM         35         UL         15700         J         24400         J           SODIUM         5000         UL         15700         J         24400         J           THALLIUM         25         VANADIUM         50         U         15700         J         24400         J	IRON	100	571		665	В	254	В				
MANGANESE         15         8.0         J         3346         3339         U         I         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	*LEAD	10										TO BOXES
MOLYBDENUM         5         UL	MAGNESIUM	5000	116	J	6520		7510					
MERCURY         0.2         UL         <	MANGANESE	15	8.0	J	346		339					and the state of t
*NICKEL 40 11.3 J 13.1 J 19 1 19 1 19 1 19 1 19 1 19 1 19 1	MOLYBDENUM	- 5										
POTASSIUM         5000         UL         2700         J         4610         J         IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	MERCURY	0.2		UL	***************************************	UL		UL				
SELENIUM         35         UL         15700         J         24400         J         10         10         10         10         10         15700         J         24400         J         10	*NICKEL	40			11.3	J	13.1	J				
SELENIUM         35         UL         15700         J         24400         J         10         10         10         10         10         15700         J         24400         J         10	POTASSIUM	5000		UL	2700	******************	4610	J	, ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	mnaupykkii		
SILVER         10         5000         UL         15700         J         24400         J         5000         5000         5000         5000         UL         15700         J         24400         J         5000	SELENIUM	AND DESCRIPTION OF THE PERSON										
SODIUM         5000         UL         15700         J         24400         J   <		000000000000000000000000000000000000000										
THALLIUM 25 VANADIUM 50 S S S S S S S S S S S S S S S S S S		5000		UL	15700	J	24400	J				
VANADIUM 50 50												
		Carrier Commence Commence										
			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 D

Laboratory Case Narrative

# USEPA - CLP

# COVER PAGE

Lab Name CHEMTEC	H CONSULTING GROUP	Contract: EPW060	47		
Lab Code: CHEM	Case No.: <u>37813</u>	NRAS No.: <u>1629.(</u>	SD SD	G No.: MC02	J7
SOW No.: ILM05.4					
	EPA Sample No.		Lab Sa	ample ID	
	MC02J7		_Z439		
	MC02J8 MC02J9		Z439 Z439		<del></del>
	MC02K0		Z439 Z439		and the second second
,	MC02K1		Z439	7-05	<del></del>
,	MC02K2 MC02K3		Z439 Z439	7-06	
	MC02K4	4	Z439 Z439		<del></del>
	MC02K5			7-09	
	MC02K6 MC02K7		Z439 Z439	97-10 97-11	
	MC02K7 MC02K8		Z439		
	MC02K9		Z439		
	MC02K9D MC02K9S		Z439 Z439	07-14 07-15	<u>—</u>
	NICU2K33		<u> 2437</u>	77-13	
	· · · · · · · · · · · · · · · · · · ·				
				ICP-AES	ICP-MS
Were ICP-AES and I	CP-MS interelement correcti	ons applied?	(Yes/No)	YES	
	CP-MS background correction	ons applied?	(Yes/No)	YES	
If yes, were raw day application of back Comments:	ta generated before ground corrections?		(Yes/No)	<u>NO</u>	<del></del>
Sandard St. William Community William Community Williams				***	
<del> </del>				· · · · · · · · · · · · · · · · · · ·	
completeness, for othe and in the computer-re	package is in compliance with than the conditions detailed adable data submitted on distipated by the last than the conditions detailed adable data submitted by the last than the last	above. Release of the cette (or via an alternational Manager of the	e data containe ate means of ele or the Manager'	d in this harded ectronic transm	opy data package iission, if approve
	3116/00	-(2) (1)(2)	( <del>4)</del>		
Date:	7/10/0/8	Title: (b) (4)(b) (4	F)(D) (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: <u>Presence/Absence</u> 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 X10 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 <u>following signature</u>.

Signature	(b) (4)	Name: (b) (4)(b) (4)
Date	0/16/98	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 World (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)
В	50	5.0	250	25
Мо	5	0.5	25	2.5

ne 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.

Laboratory Name:	Clarifications/Revisions to the RFQ for	Modifie   Analysis:	and the state of t	arang ay ang ting ting ting ang ang ang ang ang ang ang ang ang a
Laboratory Name:				
	Laboratory Name:			



# 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 Galf 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



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)

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  $\mu$ g/L and 5  $\mu$ g/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.

Sample ID on COC	Dissolved Metal Sample ID
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

ANALYTE	SAMPLES <u>AFFECTED</u>	POSITIVE <u>VALUES</u>	NON- DETECTED <u>VALUES</u>	BIAS	COMMENTS*
В	All Samples	J			>MDL <crql MSH (193%)</crql 

<sup>\*</sup> See explanation of comments in Table 1B

# TABLE 1B CODES USED IN COMMENTS COLUMN

>MDL =	Reported results are greater than MDLs but less than CRQLs and are considered
<crql< td=""><td>estimated.</td></crql<>	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

Case #: 37814

SDG: MC1GH0

BATTLEFIELD GOLF CLUB

Number of Soil Samples: 0
Number of Water Samples: 3

Site : Lab. :

A4

#### ALL DISSOLVED METALS

Sample Number :		MC1GH0	*************	MC1GH1	EIALO	MC1GH2			rannan kirak bili		**********
Sampling Location :		BG08-GW-MI	P03S	BG08-GW-M	P08S	BG08-GW-MV	V03S				
Matrix :		Water		Water	,	Water		na na na na na na na na na na na na na n			
Units:		ug/L		ug/L		ug/L		\$5.55.6 <b>6000</b>			
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	W. W. G. A. V. V. V.	47600		57300					
IRON	100	6920		12400		6980					rite i
MAGNESIUM	5000	35600		13600	1111 P 100 1100 110 110 110 110 110 110	18400	and the second second	ora produceranca con co	a and a makes		
MERCURY	0.2									100	
MOLYBDENUM	5	202 april - Walantin (2000)		knownorski ur nasorijane mrokijski	en altribuero			************************************			
POTASSIUM	5000	4820	J	2830	J	2620	J	91		170	
SODIUM	5000	23200		12700		24600			2000		SOUR

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

\$E	PA
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# **USEPA Contract Laboratory Program** Inorganic Traffic Report & Chain of Custody Record

Case No: 37814 DAS No:

								1				· · · · · · · · · · · · · · · · · · ·
Region:	3			Date Shipped: 9/2	2/2008	Ch	nain of Custody R	lecord		Sampler Signature:	6.10-3	
Project Code:	CT4354			Carrier Name: Fe	edEx	-					all lum	01
Account Code:				Airbill: 96	1942978010	Re	elinguished By	(Ďate / 1	ime)	Received By	(Date / Tim	e)
CERCLIS ID:	VAN000306	614		Shipped to: A4	Scientific	1	Ent ann	19 9/0	1/08/1700	}		
Spill ID:	ALM				44 Sawdust Road,	2		//	1 1700			
Site Name/State	Battleticia		Split/VA	16	uite 505 ne Woodlands TX 77380				······································			
Project Leader:	Erik Armiste			8	81) 292-5277	3			b <sub>e</sub>			
Action:	Preliminary		ent	` `								
Sampling Co:	Tetra Tech	EM Inc.				4						communicative 2002
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ E	STATION Bottles LOCATIO			E/TIME		GANIC PLE No.	ас Туре	
MCO2L2 MCIGHO ·	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (H (2)	INO3) BG08-GW	MP03S	S: 8/29/2008	10:00 /	ender en en en en en en en en en en en en en			AN ON PROPERTY.
MCO2L3 MC16 HI	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (H (2)	INO3) 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 (H (2)	INO3) BG08-GW-	MW035	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 (H (2)	INO3) 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			ee	
(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 BG08-SS-	MP06S	S: 8/25/2008	15:07				

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: !, = Low, M = Low/Medium, H = High	Type/Designate: Composite = C. Grab = G	Shipment Iced?
IAL DM+B+M = IAL Dis	ss Metals+Boron+Moly,   AL Met+B+ = TAL Metals + Boron	+ Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly	

BG08-SS-MP12S S: 8/26/2008 10:20

TR Number: 3-375524367-090108-0003
PR provides preliminary results. Requests for preliminary results will increase analytical costs.

M/G

TAL Met+B+ (14)

926 (Ice Only), 927 (Ice

Only) (2)

Soil (>12")/

Erik Armistead

MC02M3

# U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4354 Analytical TAT

DAS# 14

NSF# 14

37814

Date: 8/21/2008 Site Activity: Removal Assessment								
Site Name: Battlefield Golf Club			Street	Street Address: 1001 South Centerville Turnpike				
City: Chesapeake	State: VA	Latitude: 36.68982		Longitude: 76.17790				
Program: Superfund		Acct. #: 2008T03 N	302DC	C6C A3LM RS00	CERCLIS #: VANO	0003	06614	
Site ID:		Spill ID: A3LM			Operable Unit:			
Site Specific QA Plan	Submitted: No	⊠Yes Title: Battlefield	Golf Cl	lub Fly Ash Assessment	SAP		Date Approved: 8/20/2008	
EPA Project Leader:	CHRIS WAGNER	Phone#:		Cell Phone #: 804-33	7-3049		E-mail: Wagner.Christine@epa.gov	
Request Preparer: JOS	SHUA COPE	Phone#: 610-364	-2130	Cell Phone #: 215-768	3-8114		E-mail: Joshua.cope@ttemi.com	
Site Leader: ERIK AI	RMISTEAD	Phone#: 610-364	-2151	Cell Phone #: 267 446	2837		E-mail: Erik.armistead@ttemi.com	
Contractor: Tetra Tec	h EM Inc	EPA CO/PO: Lor	rie Mur	ray/Karen Wodarczyk				
#Samples 4	Matrix: soil -	Parameter: TAL I	Metals +	Boron + Molybdenum	+ Hg /4	14	Method: ILM05.4 ICPAES+Hg	
#Samples 3	Matrix: groundwate	r Parameter: TAL I	Metals +	Boron + Molybdenum	+ Hg		Method: ILM05.4 ICPAES+Hg	
#Samples 11	Matrix: potable wat	er Parameter: TAL 1	rameter: TAL metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg		Method: ILM05.4 ICPMS & Hg			
#Samples 11	1 Matrix: potable water Parameter		arameter: Al, Ca, Fe, K, Mg, Na		Method: ILM05.4 ICPAES			
#Samples 3	Matrix: groundwate	Parameter: TAL r	metals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg		Method: ILM05.4 ICPMS & Hg			
#Samples 3	Matrix: groundwate	r Parameter: Al, Ca	Ca, Fe, K, Mg, Na		Method: ILM05.4 ICPAES			
#Samples	Matrix:	Parameter:			Method:			
#Samples	Matrix:	Parameter:			Method:			
Ship Date From: 8/29	/2008 Sh	ip Date To: 9/3/2008	To: 9/3/2008 Org. Validation Level		Inorg. Validation Level IM2			
Unvalidated Data Requ	uested: 🗌 No 🔯	Yes If Yes, TAT Needed	l: 🔲 24	4hrs	s □7days ⊠ Oth	ner (	Specify)14 days	
Validated Data Packag	ge Due: 🔲 14 days	□21 days	42 da	ys Other (Specify)				
Electronic Data Delive		No 🛛 Yes (EDDs wil	l be pro	vided in Region 3 EDD	Format)			
Special Instructions: S	Special Instructions: See attached DLs.							
•								

# Appendix D

Laboratory Case Narrative

# COVER PAGE

Lab Name:	A4 Scientific, Inc.	Contract: EPW06057	
Lab Code:	A4 Case No: 37814	NRAS No.:	SDG No: MC1GHO .
SOW No.:	ILM05.4		
	EPA Sample No.	Lab Sample ID	
	-	<del>-</del>	
	MC1GH0	0009542-01	
	MC1GH0D	0009542-01D	<del></del>
	MC1GH0S	0009542-01S	
	MC1GH1	0009542-02	
	MC1GH2	0009542-03	<del></del>
	<b>,</b>		
		•	
			ICP-AES ICP-MS
Were ICP-	AES and ICP-MS interelement corrections	(Yes/No)	YES YES
applied?	And and for the fired of control of the control of	(105/10)	
Were ICP- applied?	AES and ICP-MS background corrections	(Yes/No)	YES YES
If y	es, were raw data generated before		
appl	ication of background corrections?	(Yes/No)	NO NO
Comments:	<b>;</b>		
-			
-			
		•	
T certifi	that this data package is in compliance	e with the terms and condit:	ions of the
	both technically and for completeness,		
	Release of the data contained in this ha		
	d on diskette (or via an alternate means		
	sion, if approved in advance by USEPA) h		aboratory
Manager o	or the Manager's designee, as verified by	y the following signature.	(b) (4)
		(D) $(4)$	
	(h) (4)		
Signature	(b) (4)	Name: (0) (b) (4)(b) (4)(b) (4)	
Signature	(b) (4)	Name: (b) (4)(b) (4)(b) (4)	(b) (4)(b) (4)
Signature	(b) (4)	Name: (b) (4)(b) (4)(b) (4)(b) (5) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	(b) (4)(b) (4) 86666661 0) (4)

# A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

# **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	

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.

# A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

# 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  $(Q\acute{C})$  samples is determined.

### **ICP-AES**

WATER Samples:

Concentration ( $\mu g/L$ ) =  $C * \frac{V_f}{V_i} * DF$ 

Where,

 $C = Instrument value in \mu g/L$ 

 $V_f$  = Final digestion volume (mL) (50ml)

 $V_i$  = Initial digestion volume (mL) (50ml)

DF = Dilution Factor

# 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)
В	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:



#### 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 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



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) (D) (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.

Sample ID on COC	Dissolved Metal Sample ID
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.

# <u>ATTACHMENTS</u>

# 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
APPĘNDIX 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

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED VALUES	BIAS	COMMENTS*
As	All Samples	K		High	MSH (174%)
Ba	All Samples	K		High	MSH (172%)
Cr	MC1GH0, MC1GH2	J			>MDL <crql MSH (146%)</crql 
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%)</crql 
	MC1GH1, MC1GH2	K		High	MSH (166%)

<sup>\*</sup> 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 = 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

Case #: 37814

SDG: MC1GH1

Number of Soil Samples: 0

Site :

BATTLEFIELD GOLF CLUB

Number of Water Samples: 3

Lab.:

A4

### ALL DISSOLVED METALS

-	***************************************	THE REPORT OF THE PERSON NAMED IN	NATIONAL PROPERTY.	1000LVED W	NAMES AND ADDRESS OF THE PARTY		HITTERIC CONT.	***************************************	CECCOTO CONTRACTOR	general contract cont	-
Sample Number :		MC1GH0		MC1GH1		MC1GH2					
Sampling Location :		BG08-GW-M	P03S	BG08-GW-M	P08S	BG08-GW-M	P03S				COOL
Matrix :		Water		Water		Water					DODGOOG
Units:	ug/L		ug/L		ug/L					account	
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	*********		P1000000000000000000000000000000000000			
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2										
*ARSENIC	1	1.2	к	2.7	κ	1.6	К				
BARIUM	10	21.2	Κ	17.7	κ	17.1	κ				
BERYLLIUM	1			ni dalah		Harris II					
*CADMIUM	1	and the control of th									
*CHROMIUM	2	1.7	J'	alita di wata ka wa		0.71 J					
COBALT	1	6.2	Κ	10.2	Κ	2.3	κ	CONTRACTOR OF THE STATE OF THE		N. Calda was an oraș as a carrenas and	
COPPER	2										
*LEAD	1	ende ookko 810 kii in ookko ookko diska ka	cer a contenti com	MANAGEMENT CONTRACTOR		and a contract of the section of the				\$200 Comparation \$200	
MANGANESE	1	71.8	κ	111	K	146	ĸ				
*NICKEL	1	7.8	К	12.8	κ	3.1	Κ		1	rocero volo o de	
SELENIUM	5						politic est per				
SILVER	1					W. // A					
THALLIUM	1					10 m					
VANADIUM	5	U zwiek king w zwiegog w nago oo zwiek									
ZINC	2	1.5	J.	91.8	K	10.9	κ				

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

SEPA			P	Δ
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## USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No:	37814	R
DAS No:		

Region: Project Code:	3 CT4354			Carrier Name: FedEx		Cha	in of Custody R	ecord		Sampler Signature:	Euli	annie	
Account Code: CERCLIS ID:	VAN000306	614		literatura de la companya della companya della companya de la companya della comp	51942978 4 Scientifi		<b> </b>	Industred By	(Date / Ti	me)  08   700	Received By		(Date / Time)
Spill ID: Site Name/State Project Leader:	Datifolio C		Split/VA	1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277		ands TX 77380	2.	2000 -011000	, , , , ,	tre.			
Action: Sampling Co:	Preliminary Tetra Tech		ent	(2	81) 292-5	211	4.						200 Process State
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/	Bottles	STATION LOCATION			COLLECT E/TIME		GANIC PLE No.		QC Type
MCO2L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (F (2)	HNO3)	BG08-GW-MP0	<b>93</b> S	S: 8/29/2008	10:00 <			-	-
MCO2L3 MC16-HI	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 913 (F (2)	HNO3)	BG08-GW-MP0	08S	S: 8/29/2008	9:10 🗸				
MCO2L4 MC16-HZ	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (H (2)	HNO3)	BG08-GW-MW	03S	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 (H	HNO3)	BG08-SW-SW0	)2S	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 <sub>.</sub> 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 Only) (2)	(Ice	BG08-SS-MP0	6S	S: 8/25/2008	15:07			-	-
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), 927 Only) (2)	(Ice	BG08-SS-MP1	28 .	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 Di	ss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron -	+ Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly	

### U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4354 Analytical TAT

DAS# 14

NSF#

37814

Date: 8/21/2008	Date: 8/21/2008 Site Activity: Removal Assessment											
Site Name: Battlefie	ld Golf Club		Street	Address: 1001 South Co	enterville Turnpike							
City: Chesapeake		State: VA	Latitud	de: 36.68982		Longitude: 76.17790						
Program: Superfund		Acct. #: 2008T03 N 3	302DC6	6C A3LM RS00	CERCLIS #: VANOO	000306614						
Site ID:		Spill ID: A3LM			Operable Unit:							
Site Specific QA Plan	Submitted: 🗌 No 🖾Y	es Title: Battlefield C	Golf Clu	ub Fly Ash Assessment	SAP	Date Approved: 8/20/2008						
EPA Project Leader: (	CHRIS WAGNER	Phone#:		Cell Phone #: 804-337	7-3049	E-mail: Wagner.Christine@epa.gov						
Request Preparer: JOS	SHUA COPE	Phone#: 610-364-2	2130	Cell Phone #: 215-768	3-8114	E-mail: Joshua.cope@ttemi.com						
Site Leader: ERIK AF	RMISTEAD	Phone#: 610-364-2	2151	Cell Phone #: 267 446	2837	E-mail: Erik.armistead@ttemi.com						
Contractor: Tetra Tec	h EM Inc	EPA CO/PO: Lorri	ie Murra	ay/Karen Wodarczyk								
#Samples 4	Matrix: soil -	Parameter: TAL M	letals +	Boron + Molybdenum -	+Hg A	Method: ILM05.4 ICPAES+Hg						
#Samples 3	Matrix: groundwater	Parameter: TAL M	letals +	Boron + Molybdenum -	Method: ILM05.4 ICPAES+Hg							
#Samples 11	Matrix: potable water	Parameter: TAL me	etals Lo	ow(w/o Al,Ca,Fe,K,Mg,	Method: ILM05.4 ICPMS & Hg							
#Samples 11	Matrix: potable water	Parameter: Al, Ca,	Fe, K, I	Mg, Na	Method: ILM05.4 ICPAES							
#Samples 3	Matrix: groundwater	Parameter: TAL me	etals Lo	ow(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, I	Mg, Na		Method: ILM05.4 ICPAES						
#Samples	Matrix:	Parameter:				Method:						
#Samples	Matrix:	Parameter:				Method:						
Ship Date From: 8/29/	2008 Ship Da	te To: 9/3/2008	Org. V	alidation Level		Inorg. Validation Level IM2						
Unvalidated Data Requ	uested: No X Yes	If Yes, TAT Needed:	<u> </u>	hrs 🗌 48hrs 🔲 72hr	s 🔲 7 days 🔀 Othe	ner (Specify)14 days						
Validated Data Packag	e Due:	days 🛛 30days 🗌	] 42 day	os Other (Specify)								
	rables Required: 🔲 No	Yes (EDDs will)	be prov	ided in Region 3 EDD 1	Format)							
Special Instructions: Se	ee attached DLs.											
						•						
Anal reg form												

### Appendix D

Laboratory Case Narrative

### **USEPA-CLP**

### **COVER PAGE**

	Contract: EPW06057		
Lab Code: A4 Case No: 37814	NRAS No.:	SDG No: MC1	LGH1
SOW No.: ILM05.4	-	Bank Comment	
EPA Sample No.	Lab Sample ID		
MC1GH0	0009587-01		
MC1GH0D	0009587-01D		
MC1GH0S	0009587-01s		
MC1GH1	0009587-02		
MC1GH2	0009587-03	<u> </u>	
· ,			
,			
		•	
		ICP-AES	ICP-MS
Were ICP-AES and ICP-MS interelement corrections	(Yes/No)	YES	YES
applied?	(Ies/NO)	160	180
Were ICP-AES and ICP-MS background corrections	(Yes/No)	YES	YES
applied?  If yes, were raw data generated before			
application of background corrections?	(Yes/No)	NO	NO
Comments: DISSOLEVD METALS		***	
Comments: DISSOLEVD METALS			
I certify that this data package is in compliance	with the terms and condition		
I certify that this data package is in compliance contract, both technically and for completeness,	with the terms and condition other than the condition	ns detailed	eadable data
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### A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

### 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- 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 with in the contractual holding times.

The following equations are used for calculation of sample results from raw instrument output data:

### **ICP-MS**

#### Water Samples:

Concentration (
$$\mu$$
g/L) =  $C * \frac{V_f}{V_i} * DF$ 

Where.

 $C = Instrument value in \mu g/L$  (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

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



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: MC1GH3

Site: Battlefield Golf Club

FROM: (b) (4)(b) (4)

Inorganic Data Reviewer

Through: (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

ANALYTE B	SAMPLES AFFECTED MC1GH3	POSITIVE VALUES J	NON- DETECTED VALUES	BIAS	COMMENTS* > MDL < CRQL MSH (186%)
Hg	MC1GH3		UL	Low	HT (11 Days)
Ag	MC1GH3		UL	Low	MSL (68%)

<sup>\*</sup> See explanation of comments in Table 1B

### TABLE 1B CODES USED IN COMMENTS COLUMN

>MDL <crql< th=""><th></th><th>Reported results are between MDL and CRQL and are considered estimated.</th></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

Case #: 37814

SDG: MC1GH3

Number of Soil Samples: 0 Number of Water Samples: 1

Site : Lab. : BATTLEFIELD GOLF CLUB

A4

A4

**Dissolved Metals** 

Sample Number :		MC1GH3									
Sampling Location :		BG08-SW-SW	02S								
Matrix :		Water									
Units:		ug/L									
Date Sampled :		8/29/2008									
Time Sampled :		15:40									
Dilution Factor :		1.0					or 2000				
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	531	-	entitle of the other	-	and the second second	Luciene.	and the same of the	na Shini.	Managana (	gradien.
ANTIMONY	60	P. L. Carles	趣可	<b>注意</b> 1.8年	25	WHITE SOLID	明		SINE		48
*ARSENIC	10	The state of the same	Service I	enth-meet-mark	140000	community of the same of	and the same of	Environment where the	-777-X	Microscopic out	-AVEX
BARIUM	200				The state of		tigto.	District of the last	1967	The state of	March 1
BERYLLIUM	5	Labour 19, disease	surrest.	Michigalowicki)	Auguster	ENGLANT TO SERVICE AND ADDRESS OF THE SERVICE AN	ntrope/	energenerativativa	154/055	18/98/2015/5/98	RULER
BORON	50	38.2	J	NAME OF THE	Mag		1000		2000		HE.
*CADMIUM	5		Process	THE POST OF STREET	LANCE OF THE PARTY	imuća azes	CERONI	THE PERSON NAMED AND ADDRESS OF THE PERSON NAMED AND ADDRESS O	and the same of	LANCE VIEW DIRECT	lersca
CALCIUM	5000	24600	SSS	HE SENIO	12.	是某者相對。則	F.H.		224	BELL KEN WAY	
*CHROMIUM	10	ssicriarrowcijast	TENOUS TO	ethan davine stal	1000000	Marie Mad Joresian	CALLEGE.	was known as	anel	SOREAR PARTY	CTMS-18
COBALT	50		151300	記ががいる	85.7		(E)152	福和公司的周	16-50	Safety Comment	Mili
COPPER	25	ASSESSED TO PROPERTY.	Septid	ALCO CONTRACTOR	753	886-2517/79666	D-MISSING	INSPERSE	ER/III	archender was	(ST2:01)
IRON	100	265	60(28)		1166	GEL PORTE IN APP	11993	A TO TEN AND AND A SERVICE OF THE	(CL25)	(42) / F) 1 / 1 / 1	MAN
*LEAD	10	8590	ASSECTION 1	A STATE OF THE	1000	Jesan Land	estáni	SHOWN SET	UEDED.	West Production	1865
MAGNESIUM MANGANESE	5000 15	363	12. SAN	SIMPLE SELECTION	In large	Mademan (A)	1292	Britan Const	er se	AL CONTRACTOR OF THE PARTY OF T	(38.9)
MERCURY	0.2	363	UL	Carlotte D	12/12	PER CALL	/EFE/	MERCHANICA	15275	(A) SEE THE SEA	W/S
MOLYBDENUM	5		OL	HENT AGENCA OF	3866	Manufactorics	17/2/22		stayen.	SENDONCH (CELLENIN)	257000
*NICKEL	40	14.6	J	STREET, STREET		SSENTING	DES	nd shall		MEMORINA	423
POTASSIUM	5000	4740	J	1267041671.252.000770	102.00	\$1120 mary marks	the second	CONTRACTOR INCOME.	ration	BIOLOGECUS LOCATIONITY	14.70
SELENIUM	35	0.02036 (20	arair		345	Kulturi (c. d.			73	等以多点拟	50
SILVER	10	THE SECOND PRINTS	UL	Villa Amarica (Imp	THE REAL PROPERTY.	Auto-a-form Arrest d	J. Malor		11.00(1)(0)		11.110-54.
SODIUM	5000	24700	USA	MUNICIPAL PROPERTY.		N. P. A. T.			磁表	ENGINEER PROPERTY.	44.7
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ZINC	60	27.4	J	The same of the sa	AND THE REAL PROPERTY.			THE STATE OF THE S			- V. III - LE

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

## USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 37814 DAS No:

gion: oject Code: count Code: ERCLIS ID: bill ID: le Name/State: oject Leader: ction: impling Co:	ALM Battlefield G Erik Armiste Preliminary	olf - 10% ad Assessm	•	Date Shipped: 9/2/2008  Carrier Name: FedEx  Airbill: 961942978010  Shipped to: A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277			Relinquished By (Date / Time)  1 Ends Anith 9/2/08  2.			Sampler Signature: Received By	Eul	(Date / Time)	
ORGANIC AMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND			STATION LOCATION							ас Туре
	Ground Water/ Erik Armistead	M/G		AND THE RESERVE THE PROPERTY OF THE PARTY OF	1 (HNO3)	BG08-GW-MP0	03\$	S: 8/29/2008	10:00				-
	Ground Water/ Erik Armistead	M/G	있었다. 이 전에 가지 않는데 그 그 사람이 되었다.	THE RESERVE AND ADDRESS OF THE PARTY.	3 (HNO3) '	BG08-GW-MP0	280	S: 8/29/2008	9:10			-	
02L4	Ground Water/ Erik Armistead	M/G			5 (HNO3)	BG08-GW-MW	03S	S: 8/29/2008	14:50	/			•:
	Surface Water/ Erik Armistead	M/G		and the same of the same of the same of the same of	7 (HNO3)	BG08-SW-SW0	028	S: 8/29/2008	15:40				-
6)	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	919 (HNO3) (1)		(b) (6)(b) (6)	Ø	S: 8/27/2008	14:21				4
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				· 60
	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</b> )	Potable Well/ Erik Armistead	M/G	TAL TM+B+M (14)	922 (HNO3) (1)		(b) (6)(b) (6)		S: 8/26/2008	10:13				-
02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), Only) (2)	924 (Ice	BG08-SS-MP0	)6S	S: 8/25/2008	15:07			9	-
02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)		927 (Ice	BG08-SS-MP1	12\$	S: 8/26/2008	10:20				-
	oject Code: count Code: condition: con	opject Code: count Code: count Code: crecLis ID: crecL	opject Code: count Code: crection: crection: crection: colored teader: colored teader: colored teader: critican: cri	opject Code: count	count Code: count Code: cricLIS ID: VAN000306614 citl ID: ALM le Name/State: Battlefield Golf - 10% Split/VA le Name/State: Battlefield Golf - 10% Split/VA le Name/State: Battlefield Golf - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Split/VA le le Name/State - 10% Spli	Sect Code:	Count Code:   CT4354   Carrier Name:   FedEx	CT4354   CT4354   Carrier Name:   FedEx   FedEx   Reli   Custor Code:   CT4354   Carrier Name:   FedEx   FedEx   Airbill:   961942978010   Shipped to:   A4 Scientific   154 Sawdust Road, Suite 505   The Woodlands TX 77380   (281) 292-5277     3.     4.	Select Code:   CT4354   Carrier Name:   FedEx   Select Name   Select N	Select Code:   Sele		Signature:   Sig	Signature:   Si

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

TR Number:

### U.S. EPA Region III Analytical Request Form

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 Center				enterville Turnpike							
City: Chesapeake		State: VA	Latitu	ide: 36.68982		Longitude: 76.17790					
Program: Superfund		Acct. #: 2008T03 N	302DC	6C A3LM RS00	CERCLIS #: VANOO	00306614					
Site ID:		Spill ID: A3LM			Operable Unit:						
Site Specific QA Plan	Submitted: No No	es Title: Battlefield	Golf Cl	ub Fly Ash Assessment	SAP	Date Approved: 8/20/2008					
EPA Project Leader: (	CHRIS WAGNER	Phone#:		Cell Phone #: 804-337	7-3049	E-mail: Wagner.Christine@epa.gov					
Request Preparer: JOS	SHUA COPE	Phone#: 610-364-	2130	Cell Phone #: 215-768	3-8114	E-mail: Joshua.cope@ttemi.com					
Site Leader: ERIK AF	RMISTEAD	Phone#: 610-364-	2151	Cell Phone #: 267 446	2837	E-mail: Erik.armistead@ttemi.com					
Contractor: Tetra Tec	h EM Inc	EPA CO/PO: Lon	ie Mur	ray/Karen Wodarczyk							
#Samples 4	Matrix: soil -	Parameter: TAL N	1etals +	Boron + Molybdenum	+ Hg A	4 Method: ILM05.4 ICPAES+Hg					
#Samples 3	Matrix: groundwater	Parameter: TAL N	1etals +	Boron + Molybdenum	Method: ILM05.4 ICPAES+Hg						
#Samples 11	Matrix: potable water	Parameter: TAL m	netals L	ow(w/o Al,Ca,Fe,K,Mg,	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 m	etals L	.ow(w/o Al,Ca,Fe,K,Mg,	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 Da	ate To: 9/3/2008	Org.	Validation Level		Inorg. Validation Level 1M2					
Unvalidated Data Req	uested: No Yes	If Yes, TAT Needed	: 🔲 24	4hrs	s 🗌 7days 🛛 Othe	er (Specify)14 days					
Validated Data Packag	ge Due: 14 days 2	1 days 🛛 30days 🗌	] 42 da	ays Other (Specify)							
	erables Required: No	Yes (EDDs will	be pro	vided in Region 3 EDD	Format)						
Special Instructions: S	ee attached DLs.										
A al was form											

Appendix D

Laboratory Case Narrative

### **USEPA-CLP**

### **COVER PAGE**

eb Name: A4 Scientific, Inc. Contr	ract: EPW06057	1000	
ab Code: A4 Case No: 37814 NRAS	s No.: 1629.0	SDG No: MC1GH3	
OW No.: ILM05.4			
EPA Sample No.	Lab Sample ID		
MC1GH3	0009589-01		
MC1GH3D	0009589-01D		
MC1GH3S	0009589-01S	_	
/		ICP-AES ICP-	-MS
Were ICP-AES and ICP-MS interelement corrections	(Yes/No)	YES YE	S
applied?			70
Were ICP-AES and ICP-MS background corrections	(Yes/No)	YES YE	e
applied?	(les/No)	125 12	
If yes, were raw data generated before	1142417-0014222-00		
application of background corrections?	(Yes/No)		<del></del>
Comments: %D for Cu, Mn, Zn exceeds criteria for serial dilution	. Interferences are suspecte	d	
(b) (4)			
<u> </u>	,		
certify that this data package is in compliance with	the terms and conditio	ons of the	
contract, both technically and for completeness, for ot	ther than the condition	s detailed	27 28 2 6 2 5
above. Release of the data contained in this hardcopy submitted on diskette (or via an alternate means of ele		e computer-readabl	e data
cransmission, if approved in advance by USEPA) has been	authorized by the Lab	oratory	
Manager or the Manager's designee, as verified by the f	orrowing signature.		
ignature: Name:	(b) (4)(b) (4)		
		000000	ស្ស៊ីវ
ate: 10 - 9 - 0 % Title	(b) (4)		

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ILM05.4

### A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

### **SDG NARRATIVE**

#### SAMPLE RECIEPT & LOGIN

The samples were logged in for analysis as listed in the attached work order.

**ICP-AES** 

<u>Issue:</u> 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.

<u>Resolution:</u> 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.

000000002

### A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

### **SDG NARRATIVE**

The following equations are used for calculation of sample results from raw instrument output data:

### **ICP-AES**

### Water Samples:

Concentration ( $\mu g/L$ ) =  $C * \frac{V_f}{V_i} * DF$ 

Where,

C = Instrument value in μg/L

 $V_f$  = Final digestion volume (mL) (50ml)

V<sub>i</sub> = 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.

### 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)
В	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:	

### **Contractor Laboratory Acknowledgment Document**

	No discourse Hardcopy	Uardaani	Preliminary	PDF	(A)	Cost For Modified Analysis		
Analysis	Modification Hardcopy Reference Turnaround Number Requirement		Results (Y/N)	Delivery (Y/N)	Estimated No. of Samples by Matrix (including billable QC)	(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	\$	

Proj	ect	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 catendar 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 Laboratory DECLINES to perform analysis through the modified analysis protocol outlined	d in Modified Analysis Request. ed 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.

Lab Name A4 SCIENTIFIC, INC.					Page _ of _
Received By (Print Name) (b) (4)(b	) (4)				Log-in Date
Received By (Signature) (b) (4)(b)	o) (4)				,
Case Number 37814	Sample De	livery Group	No. MCIGH	3	NRAS Number
			Correspond	ing	
Remarks:	EPA Sample #	Aqueous Sample pH	Sample Tag #	Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
1. Custody Seal(s) Present/Absent* Intact/Broken	MC 1 GH3	22	916	9589.01	1 500 WL plastic
2. Custody Seal Nos. NA	ç	Makes in the supplemental designation of the Fig. 50 and 30 August 1990.			,
3. Traffic Reports/Chain of Custody Records or Packing Lists					
4. Airbill Airbill/Sticker Present/Absent*					
5. Airbill No. 96 1942978010					
6. Sample Tags Present/Absent*					
Sample Tag Numbers Listed/Not Listed On Traffic Report/Chain of Custody Record				6	
7. Sample Condition Intact/Broken*/ Leaking					
8. Cooler Temperature Indicator Bottle					
9. Cooler Temperature 5°C					
10. Does information Yes/No* on Traffic Reports/Chain of Custody Records and sample tags agree?			/:	•	
11. Date Received at 9 · 3 · 08					
12. Time Received 10:02		/			
Sample Transfer					
Fraction DM 455, Hy Fraction	/				
Area # Cocley A Area #	_/_				
ву Ас ву	/				
on 9.3.0% on					
* Contact SMO and attach record of resolu	tion				
Reviewed By (b) (4)			Logbook No.		
Date 9-36-68			Logbook Page No.	5.3	



### 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

Cole K. Walny 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

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)

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) 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

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED VALUES	BIAS	COMMENTS*
В	MC02L3	K		High	MSH (188%)
	MC02L2, MC02L4, MC02L5	J			>MDL <crql MSH (188%)</crql 
Ag	All samples		UL	Low	MSL (69%)

<sup>\*</sup> 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

Case #: 37814

SDG: MC02L2

Number of Soil Samples: 0 Number of Water Samples: 4

Site : Lab. : BATTLEFIELD GOLF CLUB

A4

Sample Number :		MC02L2		MC02L3		MC02L4		MC02L5			
Sampling Location :		BG08-GW-MP	038	BG08-GW-MF	P08S	BG08-GW-MW	/03S	BG08-SW-SV	V02S		
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	Resul	Flag	Result	Flag	Result	Flag
ALUMINUM	200	957		593		1350		622			14
ANTIMONY	60							P. A.L.A.I.	E-		
*ARSENIC	10	l									
BARIUM	200	- 71	10					Maria i		=	
BERYLLIUM	5	l									
BORON	50	25.1	J	54.1	K	29.4	J	39.9	J		
*CADMIUM	5										
CALCIUM	5000	63500	2.	50600		62900		25900			
*CHROMIUM	10	5.3	J				ı				
COBALT	50						-			[ A	
COPPER	25						١.,				
IRON	100	12800	-11	13200		8540		422			
*LEAD	10				_						
MAGNESIUM	5000	34200		14300	17.5	19600		8940		Section.	Tit j
MANGANESE	15	151		163		197	Ι.	378			_
MERCURY	0.2	17	-				13.1	F = 10	30	1.15	
MOLYBDENUM	5										
*NICKEL	40		- 1	18.8	J		5.4	15.2	J	V4	54
POTASSIUM	5000	5220		3150	J	3020	J	4990	J		$\mathbf{I}$
SELENIUM	35	1 11	14		100						
SILVER	10		UL		UL		ŲL		UL		
SODIUM	5000	22400	LW	13500		26500		25900			
THALLIUM	25									-000	100
VANADIUM	50		100				- 1		-	1 20	10%
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



## USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 37814 R

Region:	3			Date Shipped:	9/2/2008		Chai	in of Custody R	ecord		Sampler Signature:	6.1	11-11
Project Code:	CT4354			Carrier Name:	FedEx							uu	Chrysta
Account Code:				Airbill:	961942978	3010	Relin	quished By	(Date / 1	ime)	Received By		(Date / Time)
CERCLIS ID:	VAN000306	614		Shipped to:	A4 Scientif	ic	1 4	4-1 and	\$ 91	1/08/1700			
Spill ID:	ALM			1	1544 Sawo	fust Road,		w umn	10	91700		, , wanter	
Site Name/State:	Battlefield G	iolf - 10%	Split/VA		Suite 505		2						
Project Leader:	Erik Armiste	ead			(281) 292-5	lands TX 77380	3			ře			
Action:	Preliminary	Assessm	ent		(201) 232-	3277	<u> </u>						
Sampling Co:	Tetra Tech	EM Inc.					4,						
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG N		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.		QC Type
MC02L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	910 (HNO3), 911 (2)	(HNO3)	BG08-GW-MP0	38	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 (2)	B (HNO3)	BG08-GW-MP0	)8S	S: 8/29/2008	9:10 /				e.
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 915 (2)	5 (HNO3)	BG08-GW-MW	03\$	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 (2)	7 (HNO3)	BG08-SW-SW	028	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/	M/G	TAL TM+B+M (14)	920 (HNQ3) (1)		(b) (6)(b) (6)		S: 8/25/2008	20:15				•

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: I, = Low, M = Low/Medium, H = High	Type/Designate: Composite = C. Grab = G	Shipment Iced?	
TAL DM+B+M = TAL Di	ss Metals+Boron+Moiy. TAL Met+B+ = TAL Metals + Boron	+ Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly		

BG08-SS-MP06S

BG08-SS-MP12S

S: 8/29/2008

S: 8/26/2008

S: 8/25/2008

S: 8/26/2008

10:12

10:13

15:07

10:20

TR Number:

3-375524367-090108-0003

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

M/G

M/G

M/G

M/G

TAL TM+B+M (14)

TAL TM+B+M (14)

TAL Met+B+ (14)

TAL Met+B+ (14)

921 (HNO3) (1)

922 (HNO3) (1)

Only) (2)

Only) (2)

923 (Ice Only), 924 (Ice

926 (Ice Only), 927 (Ice

Erik Armistead
Potable Well/

Erik Armistead Potable Well/

Erik Armistead

Erik Armistead

Erik Armistead

Soil (>12")/

Soil (>12")/

MC02M1

MC02M3

## U.S. EPA Region III Analytical Request Form

RAS# CT4354 Analytical TAT DAS# 14 NSF#

37814

Date: 8/21/2008	Date: 8/21/2008 Site Activity: Removal Assessment								
Site Name: Battlefie	ld Golf Club			Street	Street Address: 1001 South Centerville Tumpike				
City: Chesapeake			State: VA	Latitu	ide: 36.68982		Longitude: 76.17790		
Program: Superfund			Acct. #: 2008T03 N	302DC	6C A3LM RS00	CERCLIS #: VANOO	0306614		
Site ID:			Spill ID: A3LM			Operable Unit:			
Site Specific QA Plan	Submitted:	No ⊠Y	es Title: Battlefield	Golf Cl	ub Fly Ash Assessment	SAP	Date Approved: 8/20/2008		
EPA Project Leader:	CHRIS WAGNI	ER	Phone#:		Cell Phone #: 804-337	7-3049	E-mail: Wagner.Christine@epa.gov		
Request Preparer: JOS	SHUA COPE		Phone#: 610-364-	2130	Cell Phone #: 215-768	-8114	E-mail: Joshua.cope@ttemi.com		
Site Leader: ERIK Al	RMISTEAD		Phone#: 610-364-	2151	Cell Phone #: 267 446	2837	E-mail: Erik.armistead@ttemi.com		
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lon	rie Mur	ray/Karen Wodarczyk				
#Samples 4	Matrix: soil -		Parameter: TAL N	∕letals +	Boron + Molybdenum ·	+ Hg A	Hethod: ILM05.4 ICPAES+Hg		
#Samples 3	Matrix: groun	dwater	Parameter: TAL N	∕letals +	Boron + Molybdenum -	+ Hg	Method: ILM05.4 ICPAES+Hg		
#Samples 11	Matrix: potab	le water	Parameter: TAL n	netals L	.ow(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg		
#Samples 11	Matrix: potab	le water	Parameter: Al, Ca	, Fe, K,	Mg, Na		Method: ILM05.4 ICPAES		
#Samples 3	Matrix: groun	dwater	Parameter: TAL n	netals L	.ow(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg	Method: ILM05.4 ICPMS & Hg		
#Samples 3	Matrix: groun	dwater	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 Da	nte To: 9/3/2008	Org.	Validation Level		Inorg. Validation Level IM2		
Unvalidated Data Req	uested: No	Yes	If Yes, TAT Needed	: 🔲 24	4hrs 48hrs 72hr	s □7days ⊠ Othe	r (Specify)14 days		
Validated Data Packag	ge Due: 🗌 14 d	days 2	l days 🛛 30days 🛭	] 42 da	ays Other (Specify)				
Electronic Data Delive	erables Required	: No	Yes (EDDs wil	l be pro	vided in Region 3 EDD	Format)			
Special Instructions: S	ee attached DLs								
,									
Anal reg 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.

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

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

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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 CROL, unless a non-zero value for these analytes has been determined for the solution(s).

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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:						
and the same of th	A Section of the sect					
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	
	MC02L2	0009541-01	
	MC02L2D	0009541-01 0009541-01D	<del></del>
	MC02L2S	0009541-01B	<del></del>
	MC02L3	0009541-02	
	MC02L4	0009541-03	
	MC02L5	0009541-04	-
			ICP-AES ICP-MS
	ES and ICP-MS interelement corrections	(Yes/No)	YES YES
applied?			
Were TCP-A	ES and ICP-MS background corrections	(Yes/No)	YES YES
applied?	and ite-no background corrections	(165/10)	
If yes	s, were raw data generated before		
applio	cation of background corrections?	(Yes/No)	NO NO
G			
Comments:			
-		16 303-321	
-			
T			and of the
	that this data package is in compliance both technically and for completeness,		
	clease of the data contained in this has		
	on diskette (or via an alternate means		•
	on, if approved in advance by USEPA) has the Manager's designee, as verified by		boratory
manager or	the manager's designee, as verified by	the following signature.	1)(b) (1)
		$(\mathbf{D})$ (4	F)(D) (4)
	(b) (4)	£0%) (4)(b) (4)(b)	
Signature:	(D) (T)	Name: () (b) (4)(b) (4)(b)	4) 000000001
	- 26	CHEMIS	Γ .
Date:	10-7-08	Title: (b) (4)(b) (4)(b) (4)	
YESTER B	7		

#### A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

#### **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
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 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 "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 with in the contractual holding times.

#### A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

#### **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:** 

Concentration (
$$\mu g/L$$
) =  $C * \frac{V_f}{V_i} * DF$ 

Where,

 $C = Instrument value in \mu g/L$ 

V<sub>f</sub> = Final digestion volume (mL) (50ml)

V<sub>i</sub> = 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 William

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

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)

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) 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

ANALYTE	SAMPLES AFFECTED	POSITIVE <u>VALUES</u>	NON- DETECTED <u>VALUES</u>	<u>BIAS</u>	COMMENTS*
В	MC02L9	K		High	MSH (183%)
,	All samples except MC02L9	J			>MDL <crql MSH (183%)</crql 

<sup>\*</sup> 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

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)			
Sampling Location :		(b) (6)(b) (6	<b>6)</b>	(b) (6)(b) (6	5)	(b) (6)(b) (6	<b>)</b>	(b) (6)(b) (6	5)		8
Matrix :		Water		Water		Water		Water			2000
Units :		ug/L		ug/L		ug/L		ug/L	200000		800000
Date Sampled :		8/27/2008		8/25/2008		8/29/2008		8/26/2008	000		80
Time Sampled :		14:21	14:21		20:15		10:12		200		
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	Κ	33.6	J		
CALCIUM	5000	143000		51700		26900		18700			
IRON <sup>′</sup>	100	992		8320		155	0000000	2800			
MAGNESIUM	5000	9990		23900		14900		3350	J		
MERCURY	0.2						CONTROL		90000		
MOLYBDENUM	5										
POTASSIUM	5000		SCHOOL STATE OF THE SCHOOL	3260	J	10900	2000	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



## USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 37814

							B110 110.		
Region: Project Code:	3 CT4354			Date Shipped: 9/2/2008  Carrier Name: FedEx		Chain of Custody Re	ecord	Sampler Signature:	Eil andre
Account Code: CERCLIS ID: Spill ID: Site Name/State Project Leader: Action: Sampling Co:	VAN000306 ALM	Golf - 10% ead Assessm	•	Airbill: 961942978010  Shipped to: A4 Scientific 1544 Sawdust Road, Suite 505 The Woodlands TX 77380 (281) 292-5277		Relinquished By  1 End Amah  2.  3.	(Date / Time)	Received E	3y (Date / Time)
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No.! PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE DATE	CLARE	ORGANIC AMPLE 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-MP03	3S 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-MP08	3S 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-MW03	3S 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-SW02	2S 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 🗸		

S: 8/25/2008

S: 8/29/2008

S: 8/26/2008

S: 8/25/2008

S: 8/26/2008

20:15

10:12

10:13

15:07

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 + E	oron + Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+M	loly

BG08-SS-MP06S

BG08-S3-MP12S

TR Number:

MC02M1

MC02M3

3-375524367-090108-0003

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

M/G

M/G

M/G

M/G

M/G

TAL TM+B+M (14)

TAL TM+B+M (14)

TAL TM+B+M (14)

TAL Met+B+ (14)

TAL Met+B+ (14)

920 (HNO3) (1)

921 (HNO3) (1)

922 (HNO3) (1)

Only) (2)

Only) (2)

923 (Ice Only), 924 (Ice

926 (Ice Only), 927 (Ice

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

Potable Well/

Erik Armistead
Potable Well/

Erik Armistead
Potable Well/

Erik Armistead

Erik Armistead

Erik Armistead

Soil (>12")/

Soil (>12")/

## U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4354 Analytical TAT
DAS# 14
NSF# 14

37814

Date: 8/21/2008	te: 8/21/2008 Site Activity: Removal Assessment						
Site Name: Battlefield Golf Club			Street Address: 1001 South Centerville Turnpike				
City: Chesapeake State: VA		Latitu	ide: 36.68982		Longitude: 76.17790		
Program: Superfund			Acct. #: 2008T03 N	302DC	6C A3LM RS00	CERCLIS #: VANOO	0306614
Site ID:		•	Spill ID: A3LM			Operable Unit:	
Site Specific QA Plan	Submitted:	]No ⊠Y	es · Title: Battlefield	Golf Cl	ub Fly Ash Assessment	SAP	Date Approved: 8/20/2008
EPA Project Leader:	CHRIS WAGNE	ER	Phone#:		Cell Phone #: 804-337	7-3049	E-mail: Wagner.Christine@epa.gov
Request Preparer: JOS	SHUA COPE		Phone#: 610-364-	-2130 Cell Phone #: 215-768-8114		3-8114	E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK Al	RMISTEAD		Phone#: 610-364-	2151	Cell Phone #: 267 446	2837	E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lorr	ie Mur	ray/Karen Wodarczyk		
#Samples 4	Matrix: soil -		Parameter: TAL M	letals +	Boron + Molybdenum -	+ Hg A	
#Samples 3	Matrix: groundwater Parameter: TAL M			letals +	Boron + Molybdenum -	+ Hg	Method: ILM05.4 ICPAES+Hg
#Samples 11	nples 11 Matrix: potable water Parameter: TAL n			netals 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			ı, Fe, K, Mg, Na			Method: ILM05.4 ICPAES
#Samples 3	Matrix: groundwater Parameter: TAL n			netals Low(w/o Al,Ca,Fe,K,Mg,Na)&B,Mo,Hg			Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: ground	dwater	Parameter: Al, Ca,	l, Ca, Fe, K, Mg, Na			Method: ILM05.4 ICPAES
#Samples	Matrix:		Parameter:				Method:
#Samples	Matrix:	,	Parameter:				Method:
Ship Date From: 8/29	/2008	Ship Da	e To: 9/3/2008 Org. Validation Level		Inorg. Validation Level IM2		
Unvalidated Data Requested: No X Yes If Yes, TAT Needed: 24hrs 48hrs 72hrs 72hrs 70hrs 6ther (Specify) 14 days					r (Specify)14 days		
Validated Data Package Due: ☐ 14 days ☐ 21 days ☐ 30days ☐ 42 days · ☐ Other (Specify)							
Electronic Data Deliverables Required: No X Yes (EDDs will be provided in Region 3 EDD Format)							
Special Instructions: See attached DLs.							
Anal you 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)
В	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.

Lahoratory Name	Clarifications/Revisions to the I	RFQ for Modified Analysis:	
Lahoratory Name			
	Laboratory Name:		

Appendix D

Laboratory Case Narrative

#### **USEPA-CLP**

#### **COVER PAGE**

ab Name:	A4 Scie	entific, Inc.	· · · · · · · · · · · · · · · · · · ·	Contra	act: ]	EPW06057			
ab Code:	A4	Case No:	37814	NRAS	No.:	1629.0	SDG N	o: MCC	)2L7
OW No.:	ILM05	. 4							
		EPA Sample No.		*	Lab Sa	mple ID			
		_							
		MC02L7		<del></del>	00095		<del></del>		
		MC02L7D				56-01D			
		MC02L7S			00095	56-01S			
		MC02L8 MC02L9	***	<del></del>	00095				
1				······································					
	<i>5</i>	MC02M0		<del></del>	00095	56-04	<del></del>		
			1						
		· ·							
							IC	CP-AES	ICP-MS
Were ICP- applied?	AES and I	CP-MS interelem	ment correction	ıs		(Yes/No)		YES	YES
Vere ICP- applied?	AES and I	CP-MS backgroun	nd corrections			(Yes/No)	<del></del>	YES	YES
_		raw data genera							
appli	ication of	background co	rrections?			(Yes/No)	***************************************	NO	NO
Comments:	:			······································					
							· · · · · ·		
••		**							
				***					
certify	that thi	s data package	is in compliar	nce with	the te	rms and condit	ions of	the	
above. R	telease of	chnically and for the data contact tte (or via an	ained in this h	nardcopy	data p	ackage and in			eadable da
ransmiss	ion, if a	pproved in adva ager's designed	ance by USEPA)	has been	autho	rized by the I	aborato	гy	
ignature	:(b	(4) ······	····	Name:	<b>(</b> b	) (4)(b) (4)			
		/							
		10. 8- Q8	,					ā a	00000

ILM05.4

#### A4 SCIENTIFIC, INC.

<sup>1</sup> 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.

#### 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:

Concentration (µg/L) = 
$$C * \frac{V_f}{V_i} * DF$$

Where,

 $C = Instrument value in \mu g/L$ 

 $V_f$  = 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



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

ANALYTE Sb	SAMPLES AFFECTED MC02L7	POSITIVE VALUES B	NON- DETECTED VALUES	<u>BIAS</u> High	COMMENTS* 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	1			SD (18%)

<sup>•</sup> 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 (≤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

Case #: 37814

SDG :(b) (6)

Site: BATTLEFIELD GOLF CLUB

Number of Soil Samples: 0
Number of Water Samples: 4

Lab.:

Δ4

Sample Number :		(b) (6)	-	(b) (6)		(b) (6)		(b) (6)			
Sampling Location :		(b) (6)(b) (6)		(b) (6)(b) (6)		(b) (6)(b) (6)	6	(b) (6)(b) (6)			
Matrix :		Water		Water	-	Water		Water	_		
Units:		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			
ANALYTE	CRQL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ANTIMONY	2	1.4	В			144	Mail	Mala Tassava			135
*ARSENIC	1	1.4		1.1		1.0		2.4			
BARIUM	10	21.4	114	17.3				58.3	her.	<b>建一种</b>	
BERYLLIUM	1							0.42	J		
*CADMIUM	1	<b>"是你是这样的</b>	ipis .		Atha	<b>机能加到</b> 管	25				Si-
*CHROMIUM	2				804.00						
COBALT	1		16		3.5			7.9	135.5	D 出版的 HA 752	01-3
COPPER	2	182	J	14.7	J	226	J	15.6	J		
*LEAD	1	8.7	是當	1.4		30.2		10.0		With the last	鹰
MANGANESE	1	155	J	243	J	3.7	J	101	J		
*NICKEL	1					2.3		6.4	les		
SELENIUM	5										
SILVER	15	5. 水土油建筑	UL.	過去學術習	UL	Paris No. 18 Marie	UL		UL	<b>35,313</b> 22	226
THALLIUM	1										
VANADIUM	5				W54	推大思い		There is here.	depy		
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



# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 37814 DAS No:

Region: Project Code:	3		***************************************	Date Shipped:	9/2/2008		Chai	n of Custody R	ecord		Sampler Signature:	Eil.	anistral
Account Code:	CT4354			Carrier Name:	FedEx		Relino	quished By	(Date / Tir	ne)	Received By	con	(Date / Time)
CERCLIS ID:	VAN000306	614		Airbill:	96194297			6-1 11-	1 1				,
Spill ID:	ALM			Shipped to:	A4 Scienti 1544 Saw	10.000		we amn	29 7/2/	08 1700	1		
Site Name/State:	Battlefield G	Golf - 10%	Split/VA		Suite 505	abstrioad,	2						
Project Leader:	Erik Armiste			ļ		llands TX 77380	3			÷,			
Action:	Preliminary	Assessm	ent	İ	(281) 292-	·5277	3	-,-					
Sampling Co:	Tetra Tech	EM Inc.					4.						
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG PRESERVAT		STATION LOCATION			COLLECT E/TIME		GANIC PLE No.		QC Type
MC02L2	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+8+M (14)	910 (HNO3), 9 (2)	11 (HNO3)	BG08-GW-MP0	038	S: 8/29/2008	10:00	- 131.5 o.			
MC02L3	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	912 (HNO3), 9 (2)	13 (HNO3)	BG08-GW-MP0	08S	S: 8/29/2008	9:10				0.0
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+B+M (14)	914 (HNO3), 9 (2)	15 (HNO3)	BG08-GW-MW	03\$	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), 9 (2)	17 (HNO3)	BG08-SW-SW	028	S; 8/29/2008	15:40			0	
(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				ni.
(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				75
MC02M1	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	923 (Ice Only), Only) (2)	924 (Ice	BG08-SS-MP0	06S	S: 8/25/2008	15:07				44
MC02M3	Soil (>12")/ Erik Armistead	M/G	TAL Met+B+ (14)	926 (Ice Only), Only) (2)	927 (Ice	BG08-SS-MP1	128	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:
	2		
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C. Grab = G	Shipment Iced?
TAL DM+B+M = TAL Di	ss Metals+Boron+Moly, TAL Met+B+ = TAL Metals + Boron	+ Molybdenum, TAL TM+B+M = TAL Total Metals+Boron+Moly	

TR Number:

TR Number: 3-375524367-090108-0003
PR provides preliminary results. Requests for preliminary results will increase analytical costs. Send Copy to: (b) (4

# U.S. EPA Region III Analytical Request Form

ASQAB USE ONLY

RAS# CT4354 Analytical TAT

DAS# 14

NSF#

37814

Date: 8/21/2008		Site Activ	ity: Removal Assess	ment						
Site Name: Battlefield Golf Club  City: Chesapeake  Program: Superfund  Site ID:  Spill ID: A3I  Site Specific QA Plan Submitted:  EPA Project Leader: CHRIS WAGNER  Request Preparer: JOSHUA COPE  Site Leader: ERIK ARMISTEAD  Contractor: Tetra Tech EM Inc  #Samples 4  Matrix: soil -  #Samples 3  Matrix: groundwater  #Samples 11  Matrix: potable water  #Samples 3  Matrix: groundwater  Parameter:  #Samples 3  Matrix: groundwater  Parameter:  #Samples 3  Matrix: groundwater  Parameter:				Street	Address: 1001 South Ce	enterville Turnpike				
City: Chesapeake			State: VA	Latitude: 36.68982				Longitude: 76.17790		
Program: Superfund			Acct. #: 2008T03 N	302DC	6C A3LM RS00	CERCLIS #: VANO	003	06614		
Site ID:			Spill ID: A3LM			Operable Unit:				
Site Specific QA Plan	Submitted:	]No ⊠Y	es Title: Battlefield	Golf Club Fly Ash Assessment SAP				Date Approved: 8/20/2008		
				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			
			2151	Cell Phone #: 267 446	2837		E-mail: Erik.armistead@ttemi.com			
Contractor: Tetra Tech EM Inc EPA CO/PO: Lon			rie Mur	ray/Karen Wodarczyk						
#Samples 4	Matrix: soil -		Parameter: TAL N	Aetals +	- Boron + Molybdenum -	+ Hg /4	4	Method: ILM05.4 ICPAES+Hg		
#Samples 3	Matrix: groun	dwater	Parameter: TAL N	⁄letals +	Boron + Molybdenum -	⊦ Hg		Method: ILM05.4 ICPAES+Hg		
#Samples 11	Matrix: potab	le water	Parameter: TAL n	netals L	.ow(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg		Method: ILM05.4 ICPMS & Hg		
#Samples 11	Matrix: potab	le water	Parameter: Al, Ca	, Fe, K,	Mg, Na			Method: ILM05.4 ICPAES		
#Samples 3	Matrix: groun	dwater	Parameter: TAL n	netals L	ow(w/o Al,Ca,Fe,K,Mg,	Na)&B,Mo,Hg		Method: ILM05.4 ICPMS & Hg		
#Samples 3	Matrix: groun	dwater	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 Da	nte To: 9/3/2008	Org.	Validation Level			Inorg. Validation Level IM2		
Unvalidated Data Req	uested: No	Yes	If Yes, TAT Needed	: 🗌 24	4hrs	s 🗌 7days 🔯 Oth	er (	(Specify)14 days		
Validated Data Packag	ge Due: 14	days 2	l days 🛛 30days 🛭	] 42 da	ays Other (Specify)					
Electronic Data Delive	erables Required	: No	Yes (EDDs will	l be pro	vided in Region 3 EDD	Format)				
Special Instructions: S	ee attached DLs									
			*							
A 1										

Appendix D

Laboratory Case Narrative

# **USEPA-CLP**

# COVER PAGE

Lab Name:	A4 Scie	entific, Inc.	Contract: EPW06057	and the second s
Lab Code:	A4	Case No: 37814	NRAS No.:	SDG No: MC02L8
SOW No.:	ILM05	4		
bon no				
		EPA Sample No.	Lab Sample ID	
		MC02L7	0009557-01	
		MC02L7D	0009557-01D	
		MC02L7S	0009557-01S	
		MC02L8	0009557-02	
		MC02L9	0009557-03	
		MC02M0	0009557-04	
Were ICP-A	ES and I	CP-MS interelement correction	ons (Yes/No	ICP-AES ICP-MS YES YES
	ES and IC	CP-MS background correction	s (Yes/No)	YES YES
		aw data generated before background corrections?	(Yes/No)	NO NO
Comments:	%D for	Cu, Mn, Zn exceeds criteria for se	rial dilution. Interferences are susp	pected.
				eran era
-				
			10191	·
contract, above. Re submitted transmissi	both tech lease of on disket on, if ap the Mana	nnically and for completenes the data contained in this te (or via an alternate mesoproved in advance by USEPA ager's designee, as verified		tions detailed n the computer-readable data Laboratory
Signature:	~	(b) (4)	Name: (b) (4)(b) (4)	

COVER PAGE ILM05.4

# 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- 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 Form 1s and Form 8.

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.

# 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-MS**

### Water Samples:

Concentration (
$$\mu$$
g/L) =  $C*\frac{V_f}{V_i}*DF$ 

Where,

C = Instrument value in  $\mu g/L$  (The average of all replicate integrations).

V<sub>f</sub> = Final digestion volume (mL) (50ml)

V<sub>i</sub> = 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 of
Received By (Print Name) (b) (4)(b) Received By (Signature) (b) (4)	(4)				Log-in Date
Case Number 37814	Sample De	livery Group	p 150. MCUZL8		NRAS Number
			Correspond	ing	
Remarks:	EPA Sample #	Aqueous Semple pH	Sample Tag #	Assigned Lab #	Remarks: Condition of Sample Shipment, etc.
1. Custody Seal(s) Fresent/Absent* Intact/Broken	mwal7	42	919	9557-01	1 SOUML Plastic
2. Custody Seel Nos. NA	1 18	1	920	1 -0)	
3. Traffic Reports/Chain of Custody Records or Packing Lists	19		921	-09	
4. Airbill Airbill Sticker Present Absent*	+ MU	V	922	1 - wy	4
5. Airbill No. 961942978010	_				
6. Sample Tags Present/Absent*					
Sample Tag Listed/Not Listed Numbers on Traffic Report/Chain of Custody Record					
7. Sample Condition (Intach/Broken*/ Leaking					
B. Cooler Temperature Indicator Bottle					
9. Cooler Temperature					
10. Does information Yes/No* on Traffic Reports/Chain of Custody Records and sample tags agree?					
11. Date Received at 9-3-08			/		
12. Time Received 10.02					
Sample Transfer					
Fraction MS Fraction					
Area # Cooler A Area #					
By Az By					
on 9.3-08 on					
* Contact SMO and attach record of resolu	tion				
Reviewed By (b) (4) (b) (4)			Logbook No.	0000000	a for a
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

Colle 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

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) (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, ±CRQL) for iron (Fe) and manganese (Mn). However, the RPD for theses analytes were within Region 3 established control limits (35% RPD, ±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

ANALYTE	SAMPLES AFFECTED	POSITIVE VALUES	NON- DETECTED VALUES	BIAS	COMMENTS*
Hg	MC02M1, MC02M3		UL	Low	HT (10, 9 days)
Ag	MC02M1, MC02M3		UL	Low	MSL (66%)

<sup>\*</sup> 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

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-MP0	06S	BG08-SS-MP1	12S						
Matrix:		Soil		Soil							
Units:		mg/Kg		mg/Kg							
Date Sampled :		8/25/2008		-8/26/2008					1		
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	Г	1000							
ANTIMONY	6	. 45 5			l ad						
ARSENIC	1	1.2									
BARIUM	20	13.8	J		5		5				
BERYLLIUM	0.5										
BORON	5				9			1			
CADMIUM	0.5										
CALCIUM	500	238	J								
CHROMIUM	1	6.5		1.4					li		
COBALT	5			4 4							
COPPER	2.5	15.9									
IRON	10	2550		319							
*LEAD	1	1.9									
MAGNESIUM	500	538	J		100		Ú,	(d. 1)	B.		10
MANGANESE	1.5	15.9		2.5	ll				ı		ı
MERCURY	0.1		UL		UL				$1 > 2_{\mu}$		1
MOLYBDENUM	0.5	0.88							ı		
NICKEL	4	3.1	J		F /		~ " -	fr 13	91	وعفالا	, =57
POTASSIUM	500	332	J								
SELENIUM	3.5			3 5 E 201			7.41		Lil		s.H
SILVER	1		UL		UL						
SODIUM	500		121				J.	Contract of		1	in.
THALLIUM	2.5										
VANADIUM	5	6.6	32					112			
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



3

CT4354

ALM

VAN000306614

Erik Armistead

Battlefield Golf - 10% Split/VA

Preliminary Assessment

Region:

Project Code:

Account Code:

Site Name/State:

Project Leader:

CERCLIS ID:

Spill ID:

Action:

# USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Date Shipped:

Carrier Name:

Shipped to:

Airbill:

Case No: 37814

		DAS No:		
9/2/2008 FedEx	Chain of Custody I	Record	Sampler Signature: Eu	le annited
961942978010	Relinquished By	(Date / Time)	Received By	(Date / Time)
A4 Scientific 1544 Sawdust Road,	Ent amn	hos 9/2/08/1200		
Suite 505	2			
The Woodlands TX 77380 (281) 292-5277	3	ħ		

Sampling Co:	Tetra Tech f	EM Inc.			4.				
INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION		COLLECT /TIME	ORGA SAMPL	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		 
MC02F3	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		inn.
MC02L4	Ground Water/ Erik Armistead	M/G	TAL DM+B+M (14), TAL TM+8+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		94
(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		ø
(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 leed?								
TAL DM+B+M = TAL Di	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:

# U.S. EPA Region III Analytical Request Form

RAS# CT4354 Analytical TAT
DAS# 14
NSF#

37814

Date: 8/21/2008 Site Activity: Removal Assessment								
Site Name: Battlefield Golf Club				Street	Street Address: 1001 South Centerville Turnpike			
City: Chesapeake			State: VA	Latitu	de: 36.68982			Longitude: 76.17790
Program: Superfund			Acct. #: 2008T03 N	302DC	6C A3LM RS00	CERCLIS #: VANO	003	06614
Site ID:			Spill ID: A3LM			Operable Unit:		
Site Specific QA Plan	Submitted:	No ⊠Y	es Title: Battlefield	Golf Cl	ub Fly Ash Assessment	SAP		Date Approved: 8/20/2008
EPA Project Leader: (	CHRIS WAGNE	R	Phone#:		Cell Phone #: 804-33	7-3049		E-mail: Wagner.Christine@epa.gov
Request Preparer: JOS	SHUA COPE		Phone#: 610-364-	2130	Cell Phone #: 215-768	3-8114		E-mail: Joshua.cope@ttemi.com
Site Leader: ERIK AF	RMISTEAD		Phone#: 610-364-	2151	Cell Phone #: 267 446	2837		E-mail: Erik.armistead@ttemi.com
Contractor: Tetra Tec	h EM Inc		EPA CO/PO: Lori	ie Mur	ray/Karen Wodarczyk			
#Samples 4	Matrix: soil -		Parameter: TAL N	/letals +	Boron + Molybdenum	+ Hg A	4	Method: ILM05.4 ICPAES+Hg
#Samples 3	Matrix: ground	dwater	Parameter: TAL N	⁄letals +	Boron + Molybdenum	+ Hg		Method: ILM05.4 ICPAES+Hg
#Samples 11	Matrix: potabl	e water	Parameter: TAL n	netals L	ow(w/o Al,Ca,Fe,K,Mg	Na)&B,Mo,Hg		Method: ILM05.4 ICPMS & Hg
#Samples 11	Matrix: potabl	e water	Parameter: Al, Ca	, Fe, K,	Mg, Na			Method: ILM05.4 ICPAES
#Samples 3	Matrix: ground	dwater	Parameter: TAL n	netals L	.ow(w/o Al,Ca,Fe,K,Mg	Na)&B,Mo,Hg		Method: ILM05.4 ICPMS & Hg
#Samples 3	Matrix: ground	dwater	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 Da	te To: 9/3/2008	Org.	Validation Level			Inorg. Validation Level 1M2
Unvalidated Data Req	uested: No	∀es	If Yes, TAT Needed	: 🗌 24	4hrs 48hrs 72hı	s 🗌 7days 🛛 Oth	er (	Specify)14 days
Validated Data Packag	ge Due: 14 d	lays $\square$ 2	l days 🛛 30days 🛭	] 42 da	ays Other (Specify)			
Electronic Data Delive			Yes (EDDs will	be pro	vided in Region 3 EDD	Format)		
Special Instructions: S	ee attached DLs.							
	s.							
						• •		
Anal rea 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)
В	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 CROL, 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 Sais	entific, Inc.	Contrac		EPW06057		
Lab Code:	A4	Case No: 37814	NRAS N	es es	1629.0	SDG No: 1	MCO2M1
SOW No.:	ILM05	.4			: <del></del> -		
		EPA Sample No.	L	ab Sa	ample ID		
		MC02M1			43-01		
		MC02M1D			43-01D		
		MC02M1S			43-01S		
		MC02M3		0095	43-02		
	100						
		A					
						ICP-AE	G ICP-MS
					(75 /25 . \	YEM C	Trn 0
were ICP	AES and IC	CP-MS interelement corrections	3		(Yes/No)	YES	YES
11 <del>7. 7</del> .2012.101							
Were ICP- applied?	AES and IC	P-MS background corrections			(Yes/No)	YES	YES
1200 000 000 000		aw data generated before			(35 /35 - )	110	270
appii	cation or	background corrections?			(Yes/No)	NO	NO
Comments:							
-							
-				-			
contract,	both tech	data package is in compliant unically and for completeness,	for othe	r tha	an the condition	ns detailed	
		the data contained in this hatte (or via an alternate means				he computer-	readable data
transmiss	ion, if ap	proved in advance by USEPA) h	as been a	uthor	rized by the La	boratory	
Manager of	r the Mana	ger's designee, as verified b	y the fol	lowir	ng signature.		
a		(b) (4)	Ver	(b)	(4)(b) (4)	è	00000000i
Signature:	-		Name:		, , , , , , , , , , , , , , , , , , ,		
Date	10	. 7.08	Title:	(b	) (4)		
Date:				(~	/ \ '/		

ILM05.4

# A4 SCIENTIFIC, INC.

1544 Sawdust Road, Suite 505 • The Woodlands, TX 77380 • Phone (281) 292-5277

# 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.

# 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:

Hg Concentration (mg/kg) = Hg 
$$\mu$$
g/g =  $\frac{C}{W*S}*(0.1l)$ 

Where,

 $C = Concentration from curve (\mu g/L)$ 

W = Wet sample weight (g) (0.2gm)

S = % solids/100

#### **ICP-AES**

SOIL Samples:

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

# A4 Scientific

1544 Sawdust Road, Suite 505 The Woodlands, TX 77380 281-292-5277

# Percent Solids Logbook

	1				- 1
Effective	Area	Туре	Number-Version	RCN	
28-NOV-07	WET CHEM	FORM	5FORM03	737-0721	

DATE IN: 09/30/08	TIME IN: //:20	TEMP IN: 104°C
DATE OUT (1): 10/01/08	TIME OUT (1): 9:50	TEMP OUT (1): 104°C
DATE OUT (2):	TIME OUT (2):	TEMP OUT (2):
DATE OUT (3):	TIME OUT (3):	TEMP OUT (3):
SOP: <u>550103 - A</u> Oven ID: <u>A</u>	Method: ASTMD2216-92/SM2546 Thermometer ID: SEE	OG/ILM05.3/SOM1.1;other.

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 **
18	8100003-BLK	PMBLK 74	1.818	-	1.814	NA	NA	_
37	0009543-01		1.804	11.679	10.357			86:6
45		MCOZHZ	1.791	11.507	9.403			78.3
21	V -010	MCO2MI	1-774	11.681	10.361	1	1	.86.6
3		The second secon	************	Mehrman Specification of the state of the st				
					,			1.4
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							(b) (4) (b) (4)	Or
							12/0	0
							ICi	

-		a grown and the property of th						
Notes:								
Analys	t/Date:	(b) (4) (b) (4) 1 0	1208		Reviewer/Dat	e: <mark>(b) (</mark>	4) 10/03/07	<b>?</b> ************************************
Final Dry	/ Weight (	F) is used	when monitor	red final we	ights are consi	stent.	B	医原数医医卫气点
**Perc	ent solids	$G$ ) ={ $(F-D)$	)/(E-D)}*100	0				