



**GROUNDWATER MONITORING REPORT  
JULY 2011 EVENT  
(SECOND ANNUAL POST-CONSTRUCTION)  
MARJOL BATTERY SITE  
THROOP, PENNSYLVANIA**

*Prepared For:*

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**Project No. 92-002-324  
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## 1.0 INTRODUCTION

### 1.1 PURPOSE

Advanced GeoServices Corp. (Advanced GeoServices) was retained by Gould Electronics Inc. (Gould) to fulfill the Marjol Battery Site (the Site) groundwater monitoring requirements presented in the Final (100%) Remedial Design, Appendix I, Sampling and Analysis Plan, Tab 6, dated April 11, 2008. Groundwater beneath the Site is the regional mine pool located 115 to 275 feet beneath the ground surface. The mine pool has been degraded due to past mining activities and is not a source of drinking water. As shown on Figure 1-1, a network of five monitoring wells (MSB-1, MSB-3, MSB-4, MSB-6, and MSB-8R) was selected to monitor the groundwater conditions beneath the Site. A summary of the construction of these wells is provided in Table 1-1., and the monitoring well installation logs were included as Appendix A of the Baseline Groundwater Monitoring Report (Advanced GeoServices, November 17, 2008)

In accordance with the Final (100%) Remedial Design, one round of groundwater sampling of the five monitoring wells occurred in June 2008 prior to the start of significant excavation of contaminated materials to establish a baseline. In addition, groundwater sampling of the five wells is scheduled to occur annually for the first five years post-construction beginning in 2010. The frequency of groundwater monitoring will be reviewed in the 2015 Bi-Annual Report and may be reduced from annually with the approval of the United States Environmental Protection Agency (USEPA) and the Pennsylvania Department of Environmental Protection (PADEP). The ultimate duration of the monitoring activities is addressed in Final (100%) Remedial Design, Appendix K, the Operations and Maintenance Plan.

Advanced GeoServices conducted the second annual post-construction groundwater monitoring activities at the Site between July 6 and 7, 2011. This report presents the groundwater monitoring, groundwater quality, and hydrological conditions at the Site during this sampling event along with the previous baseline and post-construction groundwater monitoring results.



## 2.0 GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

### 2.1 SAMPLING EQUIPMENT

The following equipment was used for the groundwater monitoring well sampling:

- Low-flow bladder pump and control box capable of sampling groundwater at depths up to 500 feet;
- Nitrogen tanks;
- Electronic depth to water meter;
- Flow-through-cell consisting of pH/temperature meter, conductivity meter, dissolved oxygen meter and an oxidation-reduction potential meter;
- Turbidity Meter;
- Laboratory supplied containers for the collection of samples; and,
- Teflon<sup>®</sup> tubing.

### 2.2 SAMPLING PROCEDURES

The groundwater sampling is comprised of synoptic water level measurement, field measurements, well purging procedures, low-flow sample collection procedures, and decontamination procedures.

#### 2.2.1 Synoptic Water Level Measurement

Prior to the groundwater sampling activities, the depth-to-water was measured in each well using an electronic water level indicator. The synoptic measurements includes the measurement of water levels and well depths in the monitoring wells in as short a time frame as possible to determine the potentiometric surface across the Site (See Figure 1-1). The water levels in the wells were measured to the nearest 0.01 foot using the surveyed point at the top of the inner polyvinyl chloride (PVC) well casing for reference. Measurements were repeated at each well until two consecutive readings were within 0.01 feet. Additionally, depth-to-bottom measurements were performed to determine if any significant silting or collapse of the



monitoring wells had occurred. Two wells, MSB-1 and MSB-4, were found to have an apparent blockage at elevations 531.96 and 552.20, respectively, during the baseline event in 2008, the 2010 sampling event, and during this sampling event.

The July 2011 potentiometric surface of the groundwater beneath the Site is shown in Figure 1-1. Free flowing groundwater sounds were heard within the bedrock interval at MSB-8R during construction and baseline sampling activities in June 2008. No free flowing groundwater sounds were heard during the July 2011 event. These sounds were most likely indicative of groundwater fracture flow within the bedrock. Additionally, the presence of a barrier wall located northeast of MSB-8R along the Site's southern property line from the former mining activities appears to be affecting the groundwater level within the mine pool in this area. Based on this information, the groundwater level at MSB-8R does not appear to be in direct connection with the groundwater levels of the mine pool beneath the Marjol Battery Site. Therefore, the groundwater level from MSB-8R was not used in developing the potentiometric surface map.

### 2.2.2 Field Measurements

Field measurements performed during well purging included pH, specific conductivity, temperature, oxidation/reduction potential (ORP), dissolved oxygen (DO), and turbidity. Measurements were collected by inserting the appropriate probe in a closed, non-dedicated, plastic container (flow-through-cell) that is rinsed with deionized water prior to purging the well. Turbidity samples were collected from the flow-through-cell outflow using a separate turbidity meter.

Calibration of the instruments was completed at the beginning of each sampling day, checked in the middle of the day, and was conducted as otherwise necessary based on the functioning of the meters and equipment. The following items outline the calibration of each meter. Each meter was field calibrated in accordance with the manufacturer's specifications and appropriate calibration solutions. All calibrations were recorded in the field logbook. Field calibration procedures at a minimum included the following:



- Calibration of the field instruments were performed by trained technicians prior to the mobilization of equipment to the Site. All the instruments were calibrated as specified by the manufacturer. Standard solutions were also checked to determine stability and operating conditions. All results of field calibrations and measurements were maintained in bound field logbooks when the instrument was in use. The recorded calibration information included date and time of calibration results.
- pH meters were calibrated according to the manufacturer's instructions prior to each use and consisted of two standard buffer solutions (pH 4 and 7) obtained from chemical supply houses. The pH values of the buffers were compensated for the temperature at which the pH sample is measured.
- All temperature measurements were measured using a field thermometer and recorded to  $\pm 0.2^{\circ}\text{C}$ .
- Dissolved oxygen (DO) meters were calibrated to ambient air conditions.
- Specific conductance meters were calibrated prior to each use using a potassium chloride solution prepared by a qualified laboratory or chemical supplier.
- Turbidity meters were calibrated daily prior to use by a minimum of two standards of known turbidity as prepared by the manufacturer of the instrument.
- Oxidation – Reduction Potential (ORP) probes were checked against a standard solution prepared by a qualified laboratory or chemical supplier.

All calibration procedures performed were documented in the field logbook and included the date and time of calibration, name of the person performing the calibration, reference standards used and instrument readings.



### 2.2.3 Well Purging Procedures

Well purging procedures included water level measurements, calculation of well volumes, field measurements, purging, and sampling activities. The following step-by-step procedures are in adherence to the PADEP *Groundwater Monitoring Guidance Manual* (December 1999) and USEPA Region III groundwater sampling protocols for low flow pump purging and sampling, which are based upon the method of Puls and Barcelona (EPA/540/S-95/504).

- Step 1            Measure depth-to-water.
  
- Step 2            Calculate one well volume.
  
- Step 3            Lower the low-flow pump in the well to collect groundwater samples. The pump intake was placed at the same elevation as the baseline sample collected during the June 2008 sampling event. Groundwater sample elevations are presented in Table 1-1 and range from approximately 517 to 601 feet above mean sea level (MSL).
  
- Step 4            Calibrate meters.
  
- Step 5            Begin to purge well. USEPA recommends a purge rate of 200 to 300 milliliters/minute (ml/min).
  
- Step 6            Measure purging parameters at a minimum of every 3 to 5 minutes via the flow-through-cell for pH, temperature, specific conductivity, ORP, and DO. Turbidity will also be measured at the outflow of the flow through cell at every 3 to 5 minutes. All measurements will be recorded in the field logbook.
  
- Step 7            After conductivity and temperature have stabilized to within 3% over three readings, pH readings differ <0.1 standard pH units, ORP readings differ



within 10 mV, and turbidity measurements differ within  $\pm 10\%$ , sampling began after the flow-through-cell was disconnected.

Step 8 Using the well purging pump, the flow rate will be reduced to 100 ml/min and the sample will be collected out of the discharge line. The date and time of the sample collection will be recorded in the field logbook.

The pump and sampling equipment was decontaminated before and after sampling activities were performed at each well. Decontamination and waste handling procedures are presented in Section 2.2.5. Tabulation of the purging parameters for each well is presented in Appendix A.

#### 2.2.4 Low-Flow Sample Collection Procedures

Groundwater samples were collected for total and dissolved metals (lead, calcium, iron, magnesium, manganese, potassium, and sodium), sulfate, pH, and alkalinity (carbonate and bicarbonate) analysis using the low-flow pump and tubing at a rate of approximately 100 ml/min with the flow-through-cell disconnected. For total metal analyses, groundwater was collected directly into a laboratory prepared, pre-preserved container. For dissolved metal analyses, groundwater was transferred through a new 0.45 micron filter and then collected into a laboratory supplied, pre-preserved container. For all other analyses, groundwater was collected directly into a laboratory prepared container with no preservative. Metal analyses samples (total and dissolved) were collected in 500 milliliter high-density polyethylene (HDPE) bottles that were preserved with nitric acid to a pH value of less than 2 standard units, and all remaining analyses were collected in a single unpreserved 1 liter HDPE container. All samples were placed on ice in on-site storage containers immediately after collection, and the samples were shipped to the laboratory for analysis daily. Sample tubing was dedicated specifically to the individual wells, and filters were discarded after each use.



The selected analytical laboratory performed all analyses in accordance with accepted USEPA publication SW-846 methods so that the detection limits are lower than the performance standard for lead of 15 µg/L. The unfiltered groundwater samples were analyzed for total metals, with both filtered and unfiltered samples submitted to the laboratory for metals analysis. Filtered samples are not analyzed for metals unless the corresponding total lead concentrations exceed 15 µg/L for the well. This is in accordance with Tab 6 of the Sampling and Analysis Plan in the Final (100%) Remedial Design submitted by Advanced GeoServices on April 11, 2008.

Sample handling was in accordance with the procedures outlined in the Final (100%) Remedial Design, Appendix I, Sampling and Analysis Plan, Tab 10. The appropriate methods for extraction and analysis and required holding times to be met are given in the Final (100%) Remedial Design, Appendix I, Sampling and Analysis Plan, Tab 11, Table 11-2.

#### 2.2.5 Decontamination Procedures and Waste Handling

The sampling pump was decontaminated in the following manner.

- Exterioralconox and water wash,
- Exterior potable water rinse,
- Exterior nitric acid rinse (10% solution),
- Exterior potable water rinse,
- Exterior isopropyl alcohol rinse,
- Exterior potable water rinse,
- Cycle approximately 10 pump volumes ofalconox and water through the pump assembly,
- Nitric acid rinse (10% solution) by spraying solution into screen of pump,
- Distilled water rinse,
- Isopropyl alcohol rinse by spraying solution into screen of pump,
- Distilled water rinse,
- Cycle approximately 10 pump volumes of distilled water through the pump assembly, and,



- Air dry and store pump in plastic.

Decontamination water was collected and containerized in storage containers on-site along with the purged groundwater from each well. The amount of decontamination water and purge water generated during the 2011 sampling event was about 55 gallons. In accordance with the Sampling and Analyses Plan, once the groundwater analytical data indicates lead concentrations are below 15 µg/L, the purge water and decontamination water is allowed to be discharged on-site at a location where it would not migrate off-site or to surface water. The groundwater analytical data presented in Section 3 demonstrates the July 2011 lead concentrations in groundwater are below 15 µg/L. Based on this information, the purge water and decontamination water collected during the July 2011 sampling event was discharged in the vicinity of well MSB-8R on September 27, 2011.

### 2.3 SAMPLE CUSTODY

Custody of the samples was maintained in accordance with the Final (100%) Remedial Design, Appendix I, Sampling and Analysis Plan, Tab 10.



### 3.0 GROUNDWATER QUALITY

The validated laboratory results for the Baseline June 2008, the July 2010, and the July 2011 sampling events are presented on Table 3-1. The complete laboratory data package is presented in Appendix B. The range of total lead concentrations in 2008 was 0.092 µg/L to 9 µg/L with a mean concentration of 2.2 µg/L. In 2010, the range of total lead concentrations was from 0.37 µg/L to 4.3 µg/L with a mean of 1.2 µg/L. In 2011, the range of total lead concentrations was from below the detection limit to 2.1 µg/L with a mean of 1.1 µg/L indicating that the construction activities did not cause an increase in total lead concentrations in the groundwater. One-half the detection limit was used for the sample result when the result was below the detection limit. The total lead results are below the lead performance standard of 15 µg/L, and consequently, no dissolved metal samples were analyzed based on the total lead results. All data are acceptable and usable as validated.



#### 4.0 CONCLUSIONS AND RECOMMENDATIONS

The second annual groundwater sampling event was performed during July 2011 to monitor the groundwater conditions after completion of significant excavation activities at the Site. The data indicate that the groundwater lead results are below the applicable performance standard. The next groundwater monitoring event is tentatively scheduled for July 2012.



## **TABLES**



TABLE 1-1  
MONITORING WELL CONSTRUCTION SUMMARY  
MARJOL BATTERY SITE

Monitoring Well Identification Number	Date Installed	Boring Depth (BGS <sup>1</sup> )	Coordinates <sup>2</sup>		Overburden Thickness	Overburden Steel Casing		HQ Size Rock Core Interval(s) <sup>3</sup>	6-inch Diameter Borehole Reaming Interval	4-inch PVC Liner Screen Interval from Concrete Pad		Top of Steel Overburden Casing <sup>5</sup>	Top of Inner (PVC) Casing <sup>5</sup>	Top of Concrete Pad <sup>5</sup>	Estimated Interval of the Remnants of the Diamond Seam Based on Examination of Recovered Rock core and Downhole Video Survey		Groundwater Sample Depth/Elevation	
			X	Y		Diameter (inches)	Depth			Depth (BGS <sup>1</sup> )	Elevation (MSL <sup>4</sup> )				Depth (BGS <sup>1</sup> )	Elevation (MSL <sup>4</sup> )	Depth (TOIC <sup>6</sup> )	Elevation (MSL <sup>4</sup> )
MSB-1	September 1 - October 14, 1998	260	1550.8	3614.0	37	8	42	42-61 & 76-265.5	76-269	110-260	492.6-642.6	762.67	762.27	760.40	241.1-249 (coal pillar)	503.6-511.5 (coal pillar)	175	587
MSB-3	September 2 - October 14, 1998	313.5	2278.0	3600.0	32	8	68	68.5-328	68-330	173.5-313.5	508.9-648.9	819.79	819.22	817.33	308.5-315.9 (coal pillar)	506.5-513.9 (coal pillar)	302	517
MSB-4	September 8 - October 14, 1998	295	2875.6	3443.2	30	8	39	41-51 & 61-306	60-306	185-295	540.2-650.2	839.30	838.90	837.05	292.5-296	539.2-542.7	238	601
MSB-6	September 9 - October 14, 1998	243	2694.7	3162.6	10.5	8	55	55-243 & 244-28	55-244	183-243	575.3-635.3	826.64	826.16	824.42	228-234.2	584.1-590.3	234	592
MSB-8R	May 28 - June 3, 2008	220	1637.0	3313.7	55	8	60	N/A <sup>7</sup>	60-220	80-220	540.21-680.21	762.44	761.82	760.28	188-203 <sup>8</sup>	555-570 <sup>8</sup>	211	551

Notes:

- 1) BGS - Below Ground Surface
- 2) Coordinates - Easting (X) and Northing (Y) as collected by Carroll Engineering on June 30, 2010.
- 3) HQ rock core techniques were used only at specified intervals during well construction.
- 4) MSL - Mean Sea Level
- 5) Elevations collected by Carroll Engineering on August 18, 2010.
- 6) TOIC - Top of Inner (PVC) Casing.
- 7) Not Applicable - well MSB-8R was completed using air rotary techniques only.
- 8) The diamond coal seam was not observed during construction of well MSB-8R. The provided depth and elevation range is estimated based on data from surrounding wells.

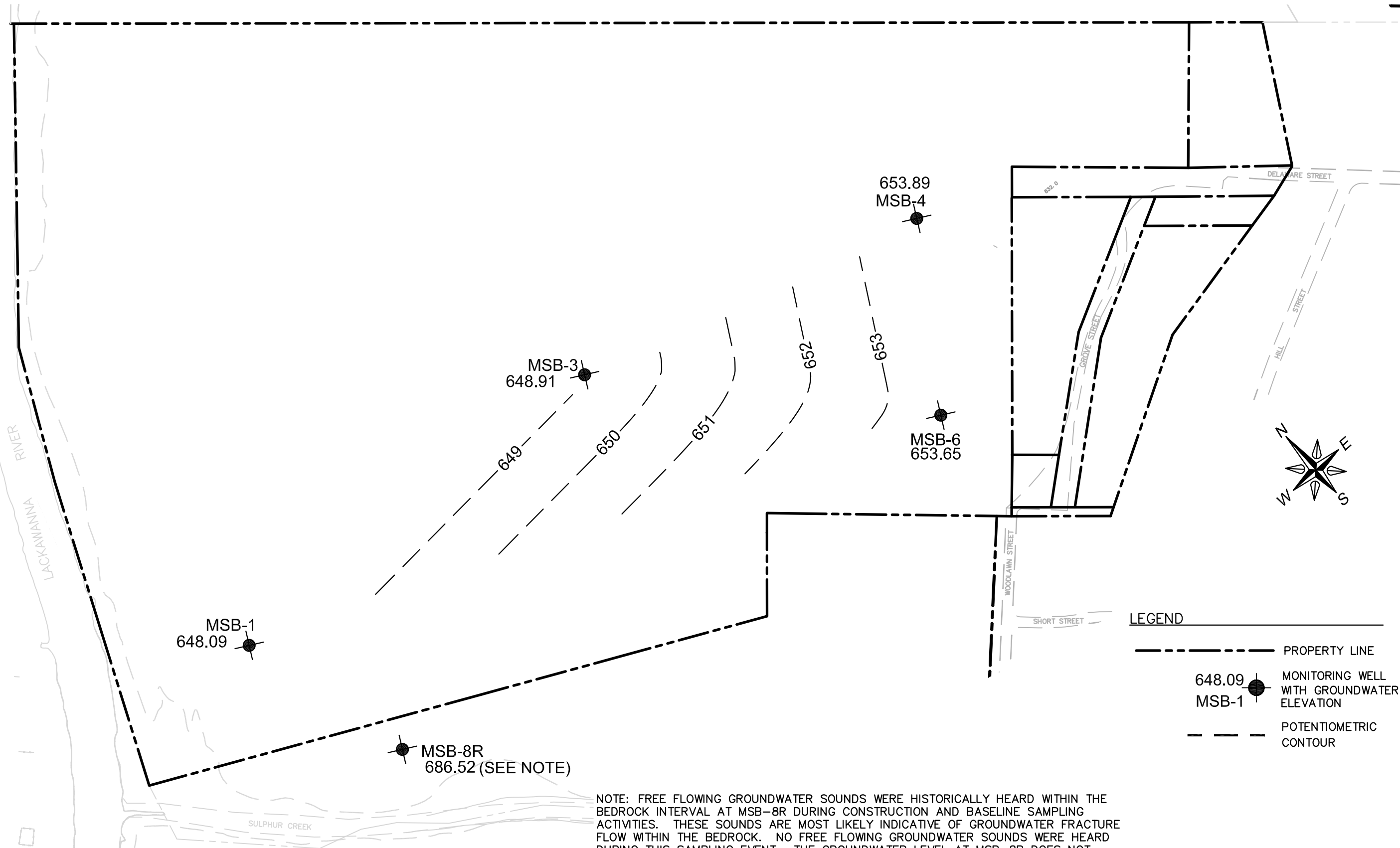
TABLE 3-1  
GROUNDWATER SAMPLING ANALYTICAL SUMMARY  
Marjol Battery Site  
Throop, Pennsylvania

Sample Location	MSB-1			MSB-1			MSB-1			MSB-3			MSB-3			MSB-3			MSB-4			MSB-4			MSB-4			MSB-6			MSB-6			MSB-6			MSB-8R			MSB-8R			MSB-8R				
Lab ID	C8F180239001 / C8H270225002			COG140497001			180-1734-2			C8F190222001 / C8H270225005			COG150494002			180-1780-1			C8F180239003 / C8H270225004			COG150494001			180-1780-2			C8F170194001 / C8H270225001			COG130479001			180-1780-4			C8F190222003 / C8H270225007			COG140497002			180-1734-1				
Sample Date	Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater			Groundwater							
Matrix	6/17/2008			7/13/2010			7/6/2011			6/18/2008			7/14/2010			7/7/2011			6/17/2008			7/14/2010			7/7/2011			6/16/2008			7/12/2010			7/7/2011			6/18/2008			7/13/2010			7/6/2011				
Remarks	Baseline Event			First Annual Event			Second Annual Event			Baseline Event			First Annual Event			Second Annual Event			Baseline Event			First Annual Event			Second Annual Event			Baseline Event			First Annual Event			Second Annual Event			Baseline Event			First Annual Event			Second Annual Event				
Parameter	Units	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL							
<b>Total Metals</b>																																															
Calcium	µg/L	40900		100	29100		100	57000		100	131000	J	100	75900		100	110000		100	205000		100	161000		100	110000		100	76300		100	74700		100	77000		100	31900	J	100	23000		100	29000		100	
Iron	µg/L	19600		50	8990		50	13000		50	58000	J	50	22300		50	25000		50	144000		50	82000		50	18000		50	22600		50	23100		50	21000		50	7320	J	50	10200		50	86000		50	
Lead	µg/L	0.37	J	1	1	U	1			U	1			0.37	J	1	2	U	1	1.3		1	0.61	J	1	1	U	1	0.092	J	1	4.3		1	2.1		1	1	U	1	1	U	1	0.69	J	1	
Magnesium	µg/L	18900		100	16400		100	32000		100	62600		100	41300		100	60000		100	64500		100	61600		100	54000		100	37400		100	38400		100	45000		100	17200		100	13700		100	18000		100	
Manganese	µg/L	1120		0.5	1060		0.5	1300		0.5	2060		0.5	1840		0.5	1700		0.5	13400		0.5	8700		0.5	2500		0.5	2120		0.5	1900		0.5	1800		0.5	1440		0.5	1060		0.5	970		0.5	
Potassium	µg/L	1330		100	1550		100	1500		100	2440		100	2310		100	2100		100	1110		100	1150		100	1300		100	2330		100	3270		100	2500		100	1590		100	1320		100	1300		100	
Sodium	µg/L	36000		100	17900		100	35000		100	40400	J	100	35100		100	38000		100	15000		100	17600		100	30000		100	37200		100	31600		100	38000		100	54900	J	100	43300		100	51000		100	
<b>Dissolved Metals</b>																																															
Calcium	µg/L	40800		100		NA			NA		133000		100		NA			NA		217000		100		NA			NA			778000		100		NA			NA			34500		100		NA			NA
Iron	µg/L	9180		50		NA			NA		19200		50		NA			NA		83800		50		NA			NA			21600		50		NA			NA			6930		50		NA			NA
Lead	µg/L	1	U	1		NA			NA		1	U	1		NA			NA		1	U	1		NA			NA			0.33	J	1		NA			NA			1	U	1		NA			NA
Magnesium	µg/L	21000		100		NA			NA		69100		100		NA			NA		75200		100		NA			NA			42700		100		NA			NA			20600		100		NA			NA
Manganese	µg/L	1040		0.5		NA			NA		2040		0.5		NA			NA		13100		0.5		NA			NA			1970		0.5		NA			NA			1560		0.5		NA			NA
Potassium	µg/L	1300		100		NA			NA		2120		100		NA			NA		1120		100		NA			NA			2330		100		NA			NA			1730		100		NA			NA
Sodium	µg/L	29900		100		NA			NA		35200		100		NA			NA		12400		100		NA			NA			31200		100		NA			NA			51700		100		NA			NA
<b>Conventionals</b>																																															
Bicarbonate Alkalinity	mg/L	104		5	78.3		5	130		5	123		5	148		5	130		5	41.4		5	73.4		5	170		5	111		5	125		5	120		5	59.8		5	55.3		5	63		5	
Carbonate Alkalinity	mg/L		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5		U	5	
pH	pH units	6.9	R		6.4	J		6.39	J	0.1	6.4	R		6.3			6.18	J	0.1	5.8	R		6			6.32	J	0.1	6.5	R		6.4	R		6.28	J	0.1	6.3	R		6.1	J		6.11	J	0.1	
Sulfate	mg/L	67.7		1	68.3		1	110		10	423		25	197		10	360		10	893		25	596		25	300		10	228		10	195		10	220		10	66.5		1	58.8		1	77		1	

Notes:  
Q = Qualifier  
Reporting Limit (RL) - The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions.  
U = Undetected at or below the detection limit  
J = Estimated  
UJ = Undetected, detection limit is qualified as estimated  
R = The value reported has been rejected  
mg/L = milligrams per liter  
µg/L = micrograms per liter  
NA = Not Analyzed



## **FIGURE**



NOTE: FREE FLOWING GROUNDWATER SOUNDS WERE HISTORICALLY HEARD WITHIN THE BEDROCK INTERVAL AT MSB-8R DURING CONSTRUCTION AND BASELINE SAMPLING ACTIVITIES. THESE SOUNDS ARE MOST LIKELY INDICATIVE OF GROUNDWATER FRACTURE FLOW WITHIN THE BEDROCK. NO FREE FLOWING GROUNDWATER SOUNDS WERE HEARD DURING THIS SAMPLING EVENT. THE GROUNDWATER LEVEL AT MSB-8R DOES NOT APPEAR TO BE IN DIRECT CONTACT WITH THE GROUNDWATER LEVELS BENEATH THE MARJOL BATTERY SITE. THEREFORE, THE GROUNDWATER LEVEL FROM MSB-8R WAS NOT USED IN DEVELOPING THE POTENTIOMETRIC SURFACE MAP.

- LEGEND**
- PROPERTY LINE
  - MONITORING WELL WITH GROUNDWATER ELEVATION
  - POTENTIOMETRIC CONTOUR

POTENTIOMETRIC SURFACE MAP

JULY 6, 2011

PROJECT MANAGER: B.L.F. SCALE: 1"=160'

CHECKED BY: J.W.D. PROJECT NUMBER: 92-002-221

DRAWN BY: C.E.P. DATE:

**ADVANCED Geoservices**  
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MARJOL BATTERY SITE  
 THROOP BOROUGH,  
 LACKAWANNA COUNTY

FIGURE

1-1



## **APPENDIX A**

### **July 2011 Groundwater Sampling Event Purge Parameters**

JULY 2011  
GROUNDWATER SAMPLING EVENT  
PURGE PARAMETERS

Marjol Battery Site  
Throop, Pennsylvania  
Project #92-002-221

Well: MSB-1

Date: 7/6/2011

DTW (ft. TOC): 114.18

DTB (ft. TOC): 228.1

Well Diameter: 4 inch

1 Volume (Gal): 74.4

Pump Setting (ft. TOC): 175

Pump Elevation: 587

Purge Rate (ml/min): 150

By: David Benson

Time	pH (pH units)	Temp. (°C)	Sp. Cond. (µS)	D.O. (mg/L)	O.R.P. (mV)	Turbidity (NTU)
1700	7.99	14.27	0.607	1.28	-298.7	150
1705	7.95	14.09	0.640	0.76	-312.8	21.2
1710	7.58	16.31	0.659	0.65	-304.6	14.7
1715	7.59	18.19	0.668	0.91	-303.9	13.0
1720	7.53	18.63	0.676	1.04	-301.3	9.21
1725	7.58	18.09	0.684	0.99	-302.7	8.49
1730	7.59	17.66	0.703	0.99	-303.8	6.79
1735	7.59	17.37	0.726	1.01	-301.8	5.72
1740	7.56	17.47	0.745	0.89	-305.0	4.91
1743	7.57	17.4	0.747	0.87	-307.4	4.85
1746	7.56	17.38	0.747	0.86	-309.3	4.71

Sample Time: 1750

Collected: (3) - HNO3 Plas. 500ml (Unfiltered)  
(3) - HNO3 Plas. 500ml (Filtered)  
(3) - Unfixed Plas. 1000ml

Comments: Removed 3 gallons  
Final depth to water - 114.17  
MS/MSD Collected

JULY 2011  
GROUNDWATER SAMPLING EVENT  
PURGE PARAMETERS

Marjol Battery Site  
Throop, Pennsylvania  
Project #92-002-221

Well: MSB-3  
Date: 7/7/2011  
DTW (ft. TOC): 170.31  
DTB (ft. TOC): 324.35  
Well Diameter: 4 inch  
1 Volume (Gal): 100.6  
Pump Setting (ft. TOC): 302  
Pump Elevation: 517  
Purge Rate (ml/min): 250  
By: David Benson

Time	pH (pH units)	Temp. (°C)	Sp. Cond. (µS)	D.O. (mg/L)	O.R.P. (mV)	Turbidity (NTU)
903	6.59	23.60	0.910	5.78	-13.0	179
908	6.74	17.96	1.018	3.37	-34.0	78.9
913	6.78	16.93	1.108	2.49	-50.3	42.2
916	6.81	16.88	1.121	1.97	-59.4	32.2
919	6.86	17.01	1.129	1.63	-69.4	29.0
922	6.90	16.94	1.134	1.46	-75.5	29.9
925	6.94	16.93	1.135	1.36	-81.4	30.9
928	6.96	16.95	1.136	1.28	-88.4	32.3
931	6.98	16.89	1.135	1.27	-90.3	33.1
934	7.00	16.91	1.134	1.28	-91.4	33.4

Sample Time: 936

Collected: (1) - HNO3 Plas. 500ml (Unfiltered)  
(1) - HNO3 Plas. 500ml (Filtered)  
(1) - Unfixed Plas. 1000ml

Comments: Removed 3 gallons  
Final depth to water - 170.38

JULY 2011  
GROUNDWATER SAMPLING EVENT  
PURGE PARAMETERS

Marjol Battery Site  
Throop, Pennsylvania  
Project #92-002-221

Well: MSB-4

Date: 7/7/2011

DTW (ft. TOC): 185.01

DTB (ft. TOC): 287

Well Diameter: 4 inch

1 Volume (Gal): 66.6

Pump Setting (ft. TOC): 238

Pump Elevation: 601

Purge Rate (ml/min): 150

By: David Benson

Time	pH (pH units)	Temp. (°C)	Sp. Cond. (µS)	D.O. (mg/L)	O.R.P. (mV)	Turbidity (NTU)
1115	6.82	18.04	1.006	7.39	-81.3	263
1125	6.67	19.75	0.998	2.25	-91.2	205
1130	6.57	19.65	1.004	2.21	-96.6	138
1133	6.55	19.60	1.006	1.89	-96.5	120
1136	6.56	19.41	1.009	1.80	-100.2	117
1139	6.58	19.04	1.012	1.75	-102.4	106.6
1142	6.56	18.99	1.010	1.73	-102.7	87.7
1145	6.57	18.72	1.014	1.65	-102.8	81.7
1148	6.61	17.85	1.015	1.65	-103.7	70.2
1151	6.57	18.07	1.009	1.52	-104.3	68.5
1154	6.55	18.80	1.007	1.46	-103.0	65.0
1157	6.59	19.06	1.011	1.49	-104.3	63.4

Sample Time: 1200

Collected: (2) - HNO3 Plas. 500ml (Unfiltered)  
(2) - HNO3 Plas. 500ml (Filtered)  
(2) - Unfixed Plas. 1000ml

Comments: Removed 3 gallons  
Final depth to water - 185.11  
Collect Field Duplicate MSB-4 with a time of 1230

JULY 2011  
GROUNDWATER SAMPLING EVENT  
PURGE PARAMETERS

Marjol Battery Site  
Throop, Pennsylvania  
Project #92-002-221

Well: MSB-6  
  
Date: 7/7/2011  
DTW (ft. TOC): 172.51  
DTB (ft. TOC): 252.05  
Well Diameter: 4 inch  
1 Volume (Gal): 51.9  
Pump Setting (ft. TOC): 234  
Pump Elevation: 592  
Purge Rate (ml/min): 180  
By: David Benson

Time	pH (pH units)	Temp. (°C)	Sp. Cond. (µS)	D.O. (mg/L)	O.R.P. (mV)	Turbidity (NTU)
1346	6.45	20.52	0.850	2.08	-61.2	212
1351	6.38	19.22	0.866	1.67	-82.1	296
1356	6.43	18.25	0.874	1.58	-96.5	223
1359	6.45	18.15	0.873	1.38	-98.7	239
1402	6.51	18.14	0.874	1.25	-97.3	305
1405	6.51	18.10	0.875	1.19	-91.1	199
1408	6.54	18.00	0.875	1.12	-90.5	191
1411	6.54	18.35	0.874	1.05	-90.5	234
1414	6.63	18.26	0.877	1.06	-112.3	229
1417	6.62	17.94	0.877	1.05	-111.7	133
1420	6.61	17.87	0.877	1.01	-114.4	171
1423	6.64	17.50	0.877	1.02	-115.5	135
1426	6.62	17.24	0.876	0.98	-114.7	127
1429	6.60	17.25	0.875	0.95	-113.1	102.4
1432	6.60	17.61	0.873	0.93	-116.5	136
1435	6.67	17.64	0.876	0.92	-119.3	121
1438	6.70	17.55	0.876	0.89	-123.1	103.4
1441	6.73	17.08	0.877	0.91	-124.3	153
1444	6.71	16.99	0.875	0.87	-123.6	151
1447	6.71	16.99	0.874	0.84	-125.7	125
1450	6.77	17.24	0.874	0.83	-131.6	120
1453	6.86	16.90	0.877	0.83	-135.8	103.7
1456	6.82	16.70	0.876	0.80	-136.4	107.2
1459	6.81	16.59	0.875	0.87	-138.0	109.1
1502	6.78	16.35	0.876	0.78	-133.4	81.0
1505	6.77	16.19	0.876	0.77	-131.6	106.7
1508	6.74	16.16	0.874	0.74	-130.7	98.0
1511	6.72	16.32	0.873	0.73	-131.7	92.1
1514	6.75	16.14	0.875	0.71	-134.7	99.4
1517	6.72	16.14	0.874	0.71	-133.1	89.3
1520	6.72	16.05	0.875	0.70	-134.9	92.9
1523	6.74	16.23	0.873	0.71	-132.1	91.4

Sample Time: 1526  
  
Collected: (1) - HNO3 Plas. 500ml (Unfiltered)  
(1) - HNO3 Plas. 500ml (Filtered)  
(1) - Unfixed Plas. 1000ml  
  
Comments: Removed 6 gallons  
Final depth to water - 172.60

JULY 2011  
GROUNDWATER SAMPLING EVENT  
PURGE PARAMETERS

Marjol Battery Site  
Throop, Pennsylvania  
Project #92-002-221

Well: MSB-8R  
  
Date: 7/6/2011  
DTW (ft. TOC): 75.30  
DTB (ft. TOC): 219.65  
Well Diameter: 4 inch  
1 Volume (Gal): 94.3  
Pump Setting (ft. TOC): 211  
Pump Elevation: 551  
Purge Rate (ml/min): 200  
By: David Benson

Time	pH (pH units)	Temp. (°C)	Sp. Cond. (µS)	D.O. (mg/L)	O.R.P. (mV)	Turbidity (NTU)
1155	6.93	26.53	0.579	3.29	-134.7	*
1205	7.16	24.65	0.612	1.49	-243.4	*
1220	7.30	20.82	0.528	0.88	-240.1	*
1230	7.73	18.60	0.592	7.00	-97.3	*
1235	7.95	16.25	0.605	6.84	-193.5	*
1240	8.06	15.63	0.604	3.80	-175.1	*
1245	8.17	15.32	0.609	2.52	-239.6	*
1250	8.12	15.43	0.609	2.04	-206.2	*
1255	8.17	15.34	0.609	1.73	-260.1	*
1300	8.22	15.15	0.612	1.41	-262.4	2620
1305	8.14	15.18	0.611	1.35	-293.0	*
1310	8.25	15.25	0.611	1.19	-224.4	*
1315	8.24	15.21	0.610	1.28	-242.1	*
1320	8.29	15.22	0.611	1.15	-246.9	3571
1325	8.13	15.42	0.611	0.90	-256.4	1381
1330	8.15	16.03	0.611	0.73	-278.2	*
1335	7.87	17.31	0.617	0.68	-247.8	*
1345	8.05	15.72	0.617	1.11	-220.7	847
1350	8.11	15.09	0.614	0.88	-296.6	*
1355	8.09	14.69	0.615	0.73	-297.4	1509
1400	8.04	14.57	0.614	0.67	-245.7	*
1405	8.08	14.52	0.615	0.69	-255.3	750
1410	8.10	14.64	0.613	0.69	-261.4	*
1415	8.09	14.51	0.613	0.61	-312.6	3665
1420	8.08	14.39	0.614	0.59	-262.0	288
1425	7.80	15.90	0.616	0.57	-174.8	243
1430	7.55	18.10	0.617	0.54	-208.1	222
1435	7.32	19.71	0.616	0.56	-288.3	179
1440	7.25	20.17	0.615	0.55	-308.1	252
1445	7.08	20.88	0.615	0.58	-259.6	265
1450	7.09	21.07	0.616	0.51	-259.6	264
1455	7.08	21.03	0.616	0.54	-254.1	263

Sample Time: 1457

Collected: (1) - HNO3 Plas. 500ml (Unfiltered)  
(1) - HNO3 Plas. 500ml (Filtered)  
(1) - Unfixed Plas. 1000ml

Comments: Removed 11 gallons  
Final depth to water - 75.95  
\* - Turbidity was too high for instrument to calculate.



**APPENDIX B**

**Data Validation Report  
of  
Groundwater Samples Collected July 6-7, 2011**

**DATA VALIDATION REPORT**  
**OF**  
**GROUNDWATER SAMPLES**  
**COLLECTED**  
**JULY 6-7, 2011**  
**FOR**  
**INORGANIC AND CONVENTIONAL ANALYSES**

Laboratory Case Numbers  
180-1734 and 180-1780

***PREPARED FOR:***

GOULD ELECTRONICS INC.  
MARJOL BATTERY SITE  
THROOP BOROUGH, PENNSYLVANIA

***PREPARED BY:***

ADVANCED GEOSERVICES CORP  
WEST CHESTER, PENNSYLVANIA

November 3, 2011  
Project Number 92-022-324

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# **DATA VALIDATION REVIEW INORGANIC**

## **INTRODUCTION**

This data validation review addresses the inorganic results from the groundwater samples collected from the Marjol Battery Site, Throop Borough, Pennsylvania. The samples were collected July 6-7, 2011. Samples were analyzed for total metals (calcium, iron, lead, magnesium, manganese, potassium, and sodium) using USEPA SW-846 Method 6020. All samples were analyzed by Test America located in Pittsburgh, PA under Case Numbers 180-1734 and 180-1780.

This review has been performed with guidance from the "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", July 2002, with Region III Modifications, April 1993, when applicable. The findings presented in this report are based upon a review of all data supplied by the laboratory. The information examined consists of sample results, analytical holding times, initial and continuing calibration standard recoveries, ICP interference check sample recoveries, serial dilution results, laboratory control sample recoveries, blank analysis results, matrix spike recoveries, laboratory and field duplicate relative percent differences, and laboratory control sample results. Samples not meeting criteria for the abovementioned parameters are listed in the "Qualifiers" section of this report under the Case No. for which they are related.

The analytical results are presented on the data summary table. The data summary table lists the analytes sampled and the associated results. Support documentation summarizing the specifics of this review is presented at the end of this report.

## **QUALIFIERS**

### **COG150494**

#### Blank Analysis

- The initial calibration blank (ICBS 180-7315/6; 7/13/2011; 14:45) had detections of calcium (27.9 µg/L), magnesium (3.55 µg/L), potassium (41.9 µg/L) and sodium (39 µg/L). The results for the above listed compounds for sample EB-1-070711 were qualified as undetected (U) due to blank contamination.
- The continuing calibration blank (CCB8 180-7315/94; 7/13/2011; 22:20) had a detection of lead (0.02 µg/L). The lead results for samples MSB-4 and MSB-4D were qualified as undetected (U) due to blank contamination.
- The continuing calibration blank (CCB8 180-7315/94; 7/13/2011; 22:20) had a detections of magnesium (9.52 µg/L), manganese (0.213 µg/L), and potassium (16.8 µg/L). The results for the above listed compounds for sample EB-1-070711 were qualified as undetected (U) due to blank contamination.

- The method blank (MB 180-6976/1-A) had a detections of iron (8.77 µg/L) and potassium (7.51 µg/L). The results for the above listed compounds for sample EB-1-070711 were qualified as undetected (U) due to blank contamination.

### **SUMMARY**

Sample results are acceptable as qualified.

# **DATA VALIDATION REVIEW CONVENTIONALS**

## **INTRODUCTION**

This data validation review addresses the conventional results from the groundwater samples collected from the Marjol Battery Site, Throop Borough, Pennsylvania. The samples were collected July 6-7, 2011. Samples were analyzed for alkalinity (total, bicarbonate, and carbonate), pH, and sulfate by USEPA Methods, by Test America located in Pittsburgh, PA under Case Numbers 180-1734 and 180-1780.

This conventional data review has been performed with guidance from "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", July 2002, with Region III Modifications, April 1993, when applicable. The findings presented in this report are based upon a review of all data supplied by the laboratory. The information examined consists of sample results, analytical holding times, initial and continuing calibration standard recoveries, calibration curves, blank analysis results, matrix spike (MS) recoveries, matrix spike duplicate (MSD) recoveries, laboratory and field duplicate relative percent differences (RPD), and laboratory control sample results.

The analytical results are presented on the data summary table. The data summary table lists the analytes sampled and the associated results. Support documentation summarizing the specifics of this review is presented at the end of this report.

## **QUALIFIERS**

### **180-1734**

Holding times

- Holding times (24 hours) for pH were exceeded by 1 day. The pH results for samples MSB-8R and MSB-1 were qualified estimated (J).

### **180-1780**

Holding times

- Holding times (24 hours) for pH were exceeded by several hours. The pH result for samples MSB-3, MSB-4, MSB-4D, and MSB-6 were qualified estimated (J).

Blank Analysis

- The continuing calibration blank (CCB3 180-6845/33; 7/8/2011; 21:57) had a detection of sulfate (0.545 mg/L). The result for sulfate for sample EB-1-070711 was qualified as undetected (U) due to blank contamination.
- The method blank (MB 180-7293/2) had a detections of alkalinity-bicarbonate (1.86 mg/L) and alkalinity-total (2.74 mg/L). The results for the above listed compounds for sample EB-1-070711 were qualified as undetected (U) due to blank contamination.

**SUMMARY**

Sample results are acceptable as qualified.

## **QUALIFIER CODES**

U - Denotes an analyte not detected at or above the associated reporting limit.

J - Denotes an estimated result.

**TABLES**  
**DATA SUMMARY**

MARJOL BATTERY SITE  
 Groundwater Sampling, 7/6/2011  
 TA-Pittsburgh# 180-1734 Project# 92-002

Sample Location		MSB-8R			MSB-1		
Lab ID		180-1734-1			180-1734-2		
Sample Date		Groundwater			Groundwater		
Matrix		7/6/2011			7/6/2011		
Remarks							
Parameter	Units	Result	Q	RL	Result	Q	RL
<b>Total Metals</b>							
Calcium	ug/L	29000		100	57000		100
Iron	ug/L	86000		50	13000		50
Lead	ug/L	0.69	J	1		U	1
Magnesium	ug/L	18000		100	32000		100
Manganese	ug/L	970		0.5	1300		0.5
Potassium	ug/L	1300		100	1500		100
Sodium	ug/L	51000		100	35000		100
<b>Conventionals</b>							
Alkalinity	mg/L	63		5	130		5
Bicarbonate Alkalinity as CaCO3	mg/L	63		5	130		5
Carbonate Alkalinity as CaCO3	mg/L		U	5		U	5
pH	SU	6.11	J	0.1	6.39	J	0.1
Sulfate	mg/L	77		1	110		10

QA Scientist *Briaa Nicholson*

Date 11/3/2011

MARJOL BATTERY SITE  
Groundwater Sampling, 7/7/2011  
TA-Pittsburgh# 180-1780 Project# 92-002

Sample Location		MSB-3			MSB-4			MSB-4D			MSB-6			EB-1-070711		
Lab ID		180-1780-1			180-1780-2			180-1780-3			180-1780-4			180-1780-5		
Sample Date		Groundwater			Groundwater			Groundwater			Groundwater			Aqueous		
Matrix		7/7/2011			7/7/2011			7/7/2011			7/7/2011			7/7/2011		
Remarks								FD of MSB-4						Equipment Blank		
Parameter	Units	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL	Result	Q	RL
<b>Total Metals</b>																
Calcium	ug/L	110000		100	110000		100	110000		100	77000		100	100	U	100
Iron	ug/L	25000		50	18000		50	19000		50	21000		50	50	U	50
Lead	ug/L	2	U	1	1	U	1	0.031	J	1	2.1		1		U	1
Magnesium	ug/L	60000		100	54000		100	56000		100	45000		100	100	U	100
Manganese	ug/L	1700		0.5	2500		0.5	2500		0.5	1800		0.5	0.6	U	0.5
Potassium	ug/L	2100		100	1300		100	1300		100	2500		100	100	U	100
Sodium	ug/L	38000		100	30000		100	31000		100	38000		100	180	U	100
<b>Conventionals</b>																
Alkalinity	mg/L	130		5	170		5	170		5	120		5	5	U	5
Bicarbonate Alkalinity as CaCO3	mg/L	130		5	170		5	170		5	120		5	5	U	5
Carbonate Alkalinity as CaCO3	mg/L		U	5		U	5		U	5		U	5		U	5
pH	SU	6.18	J	0.1	6.32	J	0.1	6.31	J	0.1	6.28	J	0.1	6.93		0.1
Sulfate	mg/L	360		10	300		10	300		10	220		10	1	U	1

  
 QA Scientist \_\_\_\_\_

Date 11/3/2011

**APPENDIX A**  
**SUPPORT DOCUMENTATION**

# INORGANIC DATA VALIDATION SUMMARY

Site Name: Marjol  
 Project Number: 92-002-324  
 Sampling Date(s): 7/6/2011

Laboratory: Test America - Pittsburgh  
 Case /Order No.: 180-1734

Compound List:  TAL  Priority Pollutant  Appendix IX  Other \_\_\_\_\_  
 Method:  CLP SOW ILMO4.  40 CFR 136  SW-846 Method \_\_\_\_\_  Other \_\_\_\_\_

The following table indicates the data validation criteria examined, any problems identified, and the QA action applied.

Data Validation Criteria:	accept	FYI	qualify	Comments
Holding Times	X			DA = 7
Initial Calibrations	X			
Continuing Calibrations	X			
CRDL Standards	X			
Blank Analysis Results		X		
ICP Interference Check Sample Recoveries	X			
Duplicate Results				NA
Field Duplicate Results				NA
Spike Analysis Recoveries		X		
Serial Dilution Results	X			
Laboratory Control Sample Results	X			
Furnace AA QC Analysis				NA
Quantitation/Detection Limits	X			
Overall Assessment of Data	X			
Other:				

General Comments: Cooler Temp: 0.8°C  
EB-1-070711 found in package 180-1780  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Accept - No qualification required.  
 FYI - For your information only, no qualification necessary.  
 Qualify - Qualify as rejected, estimated or biased  
 NA - Not applicable.  
 NR - Not reviewed.

QA Scientist *Chica Nicholson*  
 Date 11/3/2011

**Analytical Data**

Client: Advanced GeoServices Corporation

Job Number: 180-1734-1

**Client Sample ID: MSB-8R**

Lab Sample ID: 180-1734-1

Date Sampled: 07/06/2011 1457

Client Matrix: Water

Date Received: 07/07/2011 1000

---

**6020 TAL Metals (partial list)**

Analysis Method:	6020	Analysis Batch:	180-7315	Instrument ID:	M
Prep Method:	3010A	Prep Batch:	180-6848	Lab File ID:	M10713A.xml
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/13/2011 2127			Final Weight/Volume:	50 mL
Prep Date:	07/11/2011 1214				

---

Analyte	Result (ug/L)	Qualifier	MDL	RL
Calcium	29000		2.8	100
Iron	86000		6.1	50
Potassium	1300	B	5.8	100
Magnesium	18000		1.2	100
Manganese	970		0.039	0.50
Sodium	51000	B	3.8	100
Lead	0.69	J	0.019	1.0

*CPH*  
11/3/2011

**Analytical Data**

Client: Advanced GeoServices Corporation

Job Number: 180-1734-1

**Client Sample ID: MSB-1**

Lab Sample ID: 180-1734-2

Date Sampled: 07/06/2011 1750

Client Matrix: Water

Date Received: 07/07/2011 1000

---

**6020 TAL Metals (partial list)**

Analysis Method:	6020	Analysis Batch:	180-7315	Instrument ID:	M
Prep Method:	3010A	Prep Batch:	180-6848	Lab File ID:	M10713A.xml
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/13/2011 2131			Final Weight/Volume:	50 mL
Prep Date:	07/11/2011 1214				

---

Analyte	Result (ug/L)	Qualifier	MDL	RL
Calcium	57000		2.8	100
Iron	13000		6.1	50
Potassium	1500	B	5.8	100
Magnesium	32000		1.2	100
Manganese	1300		0.039	0.50
Sodium	35000	B	3.8	100
Lead	ND		0.019	1.0

*CPH*  
11/3/2011

Blanks 180-1734.xls  
Total Metals

Blank ID	Analyte	Blank Conc	Units	Blank*10 or Blank*5	Units	Samples	Sample Conc	Units	Qualify?
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Calcium	27.9	ug/L	139.5	ug/L	MSB-8R	29000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Calcium	27.9	ug/L	139.5	ug/L	MSB-1	57000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Magnesium	3.55	ug/L	17.75	ug/L	MSB-8R	18000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Magnesium	3.55	ug/L	17.75	ug/L	MSB-1	32000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Manganese	0.116	ug/L	0.58	ug/L	MSB-8R	970	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Manganese	0.116	ug/L	0.58	ug/L	MSB-1	1300	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Potassium	41.9	ug/L	209.5	ug/L	MSB-8R	1300	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Potassium	41.9	ug/L	209.5	ug/L	MSB-1	1500	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Sodium	39	ug/L	195	ug/L	MSB-8R	51000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Sodium	39	ug/L	195	ug/L	MSB-1	35000	ug/L	
Continuing Calibration Blank (CCB7 180-7315/83; 7/13/2011; 2:22)	Magnesium	6.83	ug/L	34.15	ug/L	MSB-8R	18000	ug/L	
Continuing Calibration Blank (CCB7 180-7315/83; 7/13/2011; 2:22)	Magnesium	6.83	ug/L	34.15	ug/L	MSB-1	32000	ug/L	
Continuing Calibration Blank (CCB7 180-7315/83; 7/13/2011; 2:22)	Manganese	0.243	ug/L	1.215	ug/L	MSB-8R	970	ug/L	
Continuing Calibration Blank (CCB7 180-7315/83; 7/13/2011; 2:22)	Manganese	0.243	ug/L	1.215	ug/L	MSB-1	1300	ug/L	
Continuing Calibration Blank (CCB7 180-7315/83; 7/13/2011; 2:22)	Potassium	16.1	ug/L	80.5	ug/L	MSB-8R	1300	ug/L	
Continuing Calibration Blank (CCB7 180-7315/83; 7/13/2011; 2:22)	Potassium	16.1	ug/L	80.5	ug/L	MSB-1	1500	ug/L	
Method Blank (MB 180-6848/1-A)	Potassium	9.61	ug/L	48.05	ug/L	MSB-8R	1300	ug/L	
Method Blank (MB 180-6848/1-A)	Potassium	9.61	ug/L	48.05	ug/L	MSB-1	1500	ug/L	
Method Blank (MB 180-6848/1-A)	Sodium	5.36	ug/L	26.8	ug/L	MSB-8R	51000	ug/L	
Method Blank (MB 180-6848/1-A)	Sodium	5.36	ug/L	26.8	ug/L	MSB-1	35000	ug/L	

\* Sample Concentration is < 10X (or 5X) blank concentration, Qualified as "U"

*CPH*  
11/3/2011

3-IN  
INSTRUMENT BLANKS  
METALS

Lab Name: TestAmerica Pittsburgh Job No.: 180-1734-1

SDG No.: \_\_\_\_\_

Concentration Units: ug/L

Analyte	RL	ICBIS 180-7315/6 07/13/2011 14:45		CCB 180-7315/11 07/13/2011 15:13		CCB6 180-7315/71 07/13/2011 20:17		CCB7 180-7315/83 07/13/2011 21:22	
		Found	C	Found	C	Found	C	Found	C
<b>Calcium</b>	100	* 27.9	J	ND		ND		ND	
<b>Iron</b>	50	ND		NA 6.14	J	ND		ND	
<b>Lead</b>	1.0	ND		ND		ND		ND	
<b>Magnesium</b>	100	* 3.55	J	ND		NA 5.16	J	* 6.83	J
<b>Manganese</b>	0.50	* 0.116	J	ND		NA 0.182	J	* 0.243	J
<b>Potassium</b>	100	* 41.9	J	NA 9.61	J	NA 12.6	J	* 16.1	J
<b>Sodium</b>	100	* 39.0	J	NA 6.01	J	ND		ND	

NA = No associated samples

\* = Associated samples: MSB-8R, MSB-1

*CPH*

*11/3/2011*

3-IN  
INSTRUMENT BLANKS  
METALS

Lab Name: TestAmerica Pittsburgh Job No.: 180-1734-1

SDG No.: \_\_\_\_\_

Concentration Units: ug/L

Analyte	RL	CCB8 180-7315/94 07/13/2011 22:20							
		Found	C	Found	C	Found	C	Found	C
<b>Calcium</b>	100	ND							
<b>Iron</b>	50	ND							
<b>Lead</b>	1.0	NA 0.0200	J						
<b>Magnesium</b>	100	NA 9.52	J						
<b>Manganese</b>	0.50	NA 0.213	J						
<b>Potassium</b>	100	NA 16.8	J						
<b>Sodium</b>	100	ND							

NA = No associated samples

*CPH*

*11/3/2011*

3-IN  
METHOD BLANK  
METALS

Lab Name: TestAmerica Pittsburgh Job No.: 180-1734-1

SDG No.: \_\_\_\_\_

Concentration Units: ug/L Lab Sample ID: MB 180-6848/1-A

Instrument Code: M Batch No.: 7315

CAS No.	Analyte	Concentration	C	Q	Method
7440-70-2	Calcium	ND			6020
7439-89-6	Iron	ND			6020
* 7440-09-7	Potassium	9.61	J		6020
7439-95-4	Magnesium	ND			6020
7439-96-5	Manganese	ND			6020
* 7440-23-5	Sodium	5.36	J		6020
7439-92-1	Lead	ND			6020

\* = Associated samples: MSB-8R, MSB-1



## WET CHEMISTRY DATA VALIDATION SUMMARY

Site Name: Marjol  
 Project Number: 92-002-324  
 Sampling Date(s): 7/6/2011

Laboratory: Test America - Pittsburgh  
 Case /Order No.: 180-1734

Parameter List: Alkalinity (Total, Bicarbonate, Carbonate), pH, Sulfate  
 Method: SM2320B, SM4500H+B, MCAWW 300.0

The following table indicates the data validation criteria examined, any problems identified, and the QA action applied.

Data Validation Criteria:	accept	FYI	qualify	Comments
Holding Times			X	pH
Calibration Curve	X			
Initial Calibration	X			
Continuing Calibration	X			
Laboratory Control Sample Results	X			
Blank Analysis Results		X		
Duplicate Analysis Results	X			
Field Duplicate Analysis Results				NA
Matrix Spike Analysis Results	X			
Quantitation/Detection Limits	X			
Overall Assessment of Data	X			
Other:				

General Comments: Cooler Temp: 0.8°C  
EB-1-070711 found in package 180-1780

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Accept - No qualification required.  
 FYI - For your information only, no qualification necessary.  
 Qualify - Qualify as rejected, estimated or biased  
 NA - Not applicable

QA Scientist *Erica Nicholson*  
 Date 11/3/2011

Client: Advanced GeoServices Corporation

Job Number: 180-1734-1

General Chemistry

Client Sample ID: MSB-8R

Lab Sample ID: 180-1734-1

Date Sampled: 07/06/2011 1457

Client Matrix: Water

Date Received: 07/07/2011 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate	77		mg/L	0.21	1.0	1.0	300.0
	Analysis Batch: 180-6943		Analysis Date: 07/11/2011 1505				
Bicarbonate Alkalinity as CaCO3	63	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293		Analysis Date: 07/14/2011 1047				
Carbonate Alkalinity as CaCO3	ND		mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293		Analysis Date: 07/14/2011 1047				
Alkalinity	63	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293		Analysis Date: 07/14/2011 1047				
pH	6.11	HF J	SU	0.100	0.100	1.0	SM 4500 H+ B
	Analysis Batch: 180-6637		Analysis Date: 07/08/2011 0851				

*CPH*

*11/3/2011*

Client: Advanced GeoServices Corporation

Job Number: 180-1734-1

General Chemistry

Client Sample ID: MSB-1

Lab Sample ID: 180-1734-2

Client Matrix: Water

Date Sampled: 07/06/2011 1750

Date Received: 07/07/2011 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate	110	B	mg/L	2.1	10	10	300.0
	Analysis Batch: 180-6845	Analysis Date: 07/08/2011 2349					
Bicarbonate Alkalinity as CaCO3	130	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1056					
Carbonate Alkalinity as CaCO3	ND		mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1056					
Alkalinity	130	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1056					
pH	6.39	H F J	SU	0.100	0.100	1.0	SM 4500 H+ B
	Analysis Batch: 180-6727	Analysis Date: 07/08/2011 1619					

*CPH*

*11/3/2011*

**HOLDING TIMES**  
**180-1734 - WC**

Site Name: Marjol

Conventionals

Sample ID Field	Lab	Analyte	Matrix	Sample Date	Date of Analysis	Hold Time	DA	QA Decision
MSB-8R	180-1734-1	Alkalinity - Bicarbonate	Groundwater	7/6/2011	7/14/2011	14 days	8	
		Alkalinity - Carbonate	Groundwater	7/6/2011	7/14/2011	14 days	8	
		Alkalinity - Total	Groundwater	7/6/2011	7/14/2011	14 days	8	
		pH	Groundwater	7/6/2011	7/8/2011	24 hours	2	*
		Sulfate	Groundwater	7/6/2011	7/11/2011	28 days	5	
MSB-1	180-1734-2	Alkalinity - Bicarbonate	Groundwater	7/6/2011	7/14/2011	14 days	8	
		Alkalinity - Carbonate	Groundwater	7/6/2011	7/14/2011	14 days	8	
		Alkalinity - Total	Groundwater	7/6/2011	7/14/2011	14 days	8	
		pH	Groundwater	7/6/2011	7/8/2011	24 hours	2	*
		Sulfate	Groundwater	7/6/2011	7/8/2011	28 days	2	

**Note:**

**DA = Number of days elapsed from sampling to analysis.**

*CPH*

*11/3/2011*

Blanks 180-1734.xls  
 Conventionals

Blank ID	Analyte	Blank Conc	Units	Blank*10 or Blank*5	Units	Samples	Sample Conc	Units	Qualify?
Continuing Calibration Blank (CCB3 180-6845/33; 7/8/2011; 21:57)	Sulfate	0.545	mg/L	2.725	mg/L	MSB-1	110	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Bicarbonate	1.86	mg/L	9.3	mg/L	MSB-8R	63	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Carbonate	0.88	mg/L	4.4	mg/L	MSB-8R	ND	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Total	2.74	mg/L	13.7	mg/L	MSB-8R	63	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Bicarbonate	1.86	mg/L	9.3	mg/L	MSB-1	130	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Carbonate	0.88	mg/L	4.4	mg/L	MSB-1	ND	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Total	2.74	mg/L	13.7	mg/L	MSB-1	130	mg/L	

\* Sample Concentration is < 10X (or 5X) blank concentration, Qualified as "U"

*CPH*

2-IN  
 CALIBRATION QUALITY CONTROL  
 GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-1734-1  
 SDG No.: \_\_\_\_\_  
 Analyst: lw Batch Start Date: 07/08/2011  
 Reporting Units: mg/L Analytical Batch No.: 6845

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
2	ICV	10:54	Sulfate	58.7	60.0	98	90-110		ICICV_00055
3	CCV	11:08	Sulfate	47.8	50.0	96	90-110		ICCCV_00050
NA	4	CCB	11:22	Sulfate	0.549			J	
14	CCV	13:49	Sulfate	47.9	50.0	96	90-110		ICCCV_00050
NA	15	CCB	14:03	Sulfate	0.572			J	
32	CCV	21:43	Sulfate	47.4	50.0	95	90-110		ICCCV_00050
*	33	CCB	21:57	Sulfate	0.545			J	
44	CCV	06:25	Sulfate	47.4	50.0	95	90-110		ICCCV_00050
45	CCB	06:39	Sulfate	ND					

NA = No associated samples

\* = Associated samples: MSB-1

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

*lw*

11/3/2011

2-IN  
 CALIBRATION QUALITY CONTROL  
 GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-1734-1  
 SDG No.: \_\_\_\_\_  
 Analyst: CL Batch Start Date: 07/14/2011  
 Reporting Units: mg/L Analytical Batch No.: 7293

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
11	CCV	11:56	Alkalinity	27.3	32.6	84	80-120		WALKCCV_00007
NA 12	CCB	12:05	Bicarbonate Alkalinity as CaCO3	0.950				J	
			Carbonate Alkalinity as CaCO3	ND					
			Alkalinity	0.950				J	

NA = No associated samples

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

*CL*  
11/3/2011

3-IN  
METHOD BLANK  
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-1734-1

SDG No.: \_\_\_\_\_

Method	Lab Sample ID	Analyte	Result Qual	Units	RL	Dil
Batch ID: 6845 Date: 07/08/2011 11:51						
NA 300.0	MB 180-6845/6	Sulfate	0.554 J	mg/L	1.0	1
Batch ID: 6943 Date: 07/11/2011 10:57						
300.0	MB 180-6943/7	Sulfate	ND	mg/L	1.0	1
* Batch ID: 7293 Date: 07/14/2011 10:38						
SM 2320B	MB 180-7293/2	Bicarbonate Alkalinity as CaCO3	1.86 J	mg/L	5.0	1
SM 2320B	MB 180-7293/2	Carbonate Alkalinity as CaCO3	0.880 J	mg/L	5.0	1
SM 2320B	MB 180-7293/2	Alkalinity	2.74 J	mg/L	5.0	1

NA = No associated samples

\* = Associated samples: MSB-8R, MSB-1

*CPH*  
11/3/2011

## INORGANIC DATA VALIDATION SUMMARY

Site Name: Marjol  
 Project Number: 92-002-324  
 Sampling Date(s): 7/7/2011

Laboratory: Test America - Pittsburgh  
 Case /Order No.: 180-1780

Compound List:  TAL  Priority Pollutant  Appendix IX  Other Ca, Fe, Pb, Mg, Mn, K, Na  
 Method:  CLP SOW ILMO4  40 CFR 136  SW-846 Method 6020  Other \_\_\_\_\_

The following table indicates the data validation criteria examined, any problems identified, and the QA action applied.

Data Validation Criteria:	accept	FYI	qualify	Comments
Holding Times	X			DA = 6
Initial Calibrations	X			
Continuing Calibrations	X			
CRDL Standards	X			
Blank Analysis Results			X	
ICP Interference Check Sample Recoveries	X			
Duplicate Results				NA
Field Duplicate Results	X			MSB-4/ MSB-4D
Spike Analysis Recoveries	X			
Serial Dilution Results	X			
Laboratory Control Sample Results	X			
Furnace AA QC Analysis				NA
Quantitation/Detection Limits	X			
Overall Assessment of Data	X			
Other:				

General Comments: Cooler Temp: 1.7°C  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Accept - No qualification required.  
 FYI - For your information only, no qualification necessary.  
 Qualify - Qualify as rejected, estimated or biased  
 NA - Not applicable.  
 NR - Not reviewed.

QA Scientist *Chica Nicholson*  
 Date 11/3/2011

Analytical Data

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

Client Sample ID: MSB-3

Lab Sample ID: 180-1780-1

Date Sampled: 07/07/2011 0936

Client Matrix: Water

Date Received: 07/08/2011 1000

6020 TAL Metals (partial list)

Analysis Method: 6020      Analysis Batch: 180-7315      Instrument ID: M  
Prep Method: 3010A      Prep Batch: 180-6976      Lab File ID: M10713A.xml  
Dilution: 1.0      Initial Weight/Volume: 50 mL  
Analysis Date: 07/13/2011 2233      Final Weight/Volume: 50 mL  
Prep Date: 07/12/2011 1107

Analyte	Result (ug/L)	Qualifier	MDL	RL
Calcium	110000		2.8	100
Iron	25000	B	6.1	50
Potassium	2100	B	5.8	100
Magnesium	60000		1.2	100
Manganese	1700	B	0.039	0.50
Sodium	38000		3.8	100
Lead	2.0	U	0.019	1.0

*CPH*

11/3/2011

Analytical Data

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

Client Sample ID: MSB-4

Lab Sample ID: 180-1780-2

Date Sampled: 07/07/2011 1200

Client Matrix: Water

Date Received: 07/08/2011 1000

6020 TAL Metals (partial list)

Analysis Method: 6020      Analysis Batch: 180-7315      Instrument ID: M  
Prep Method: 3010A      Prep Batch: 180-6976      Lab File ID: M10713A.xml  
Dilution: 1.0      Initial Weight/Volume: 50 mL  
Analysis Date: 07/13/2011 2238      Final Weight/Volume: 50 mL  
Prep Date: 07/12/2011 1107

Analyte	Result (ug/L)	Qualifier	MDL	RL
Calcium	110000		2.8	100
Iron	18000	B	6.1	50
Potassium	1300	B	5.8	100
Magnesium	54000		1.2	100
Manganese	2500	B	0.039	0.50
Sodium	30000		3.8	100
Lead	1.0 <del>0.022</del>	U	0.019	1.0

*CPH*

11/3/2011

Analytical Data

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

Client Sample ID: MSB-4D

Lab Sample ID: 180-1780-3

Client Matrix: Water

Date Sampled: 07/07/2011 1230

Date Received: 07/08/2011 1000

6020 TAL Metals (partial list)

Analysis Method: 6020      Analysis Batch: 180-7315      Instrument ID: M  
Prep Method: 3010A      Prep Batch: 180-6976      Lab File ID: M10713A.xml  
Dilution: 1.0      Initial Weight/Volume: 50 mL  
Analysis Date: 07/13/2011 2242      Final Weight/Volume: 50 mL  
Prep Date: 07/12/2011 1107

Analyte	Result (ug/L)	Qualifier	MDL	RL
Calcium	110000		2.8	100
Iron	19000	B	6.1	50
Potassium	1300	B	5.8	100
Magnesium	56000		1.2	100
Manganese	2500	B	0.039	0.50
Sodium	31000		3.8	100
Lead	0.031	J	0.019	1.0

*CPH*

11/3/2011

Analytical Data

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

Client Sample ID: MSB-6

Lab Sample ID: 180-1780-4

Client Matrix: Water

Date Sampled: 07/07/2011 1526

Date Received: 07/08/2011 1000

6020 TAL Metals (partial list)

Analysis Method: 6020      Analysis Batch: 180-7315      Instrument ID: M  
Prep Method: 3010A      Prep Batch: 180-6976      Lab File ID: M10713A.xml  
Dilution: 1.0      Initial Weight/Volume: 50 mL  
Analysis Date: 07/13/2011 2246      Final Weight/Volume: 50 mL  
Prep Date: 07/12/2011 1107

Analyte	Result (ug/L)	Qualifier	MDL	RL
Calcium	77000		2.8	100
Iron	21000	B	6.1	50
Potassium	2500	B	5.8	100
Magnesium	45000		1.2	100
Manganese	1800	B	0.039	0.50
Sodium	38000		3.8	100
Lead	2.1		0.019	1.0

*CPH*

11/3/2011

Analytical Data

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

Client Sample ID: EB-1-070711

Lab Sample ID: 180-1780-5

Date Sampled: 07/07/2011 1645

Client Matrix: Water

Date Received: 07/08/2011 1000

6020 TAL Metals (partial list)

Analysis Method:	6020	Analysis Batch:	180-7315	Instrument ID:	M
Prep Method:	3010A	Prep Batch:	180-6976	Lab File ID:	M10713A.xml
Dilution:	1.0			Initial Weight/Volume:	50 mL
Analysis Date:	07/13/2011 2251			Final Weight/Volume:	50 mL
Prep Date:	07/12/2011 1107				

Analyte	Result (ug/L)	Qualifier	MDL	RL
Calcium	100 <del>28</del>	<del>B</del> U	2.8	100
Iron	50 <del>20</del>	<del>B</del> U	6.1	50
Potassium	100 <del>11</del>	<del>B</del> U	5.8	100
Magnesium	100 <del>8.2</del>	<del>B</del> U	1.2	100
Manganese	0.60	<del>B</del> U	0.039	0.50
Sodium	180	U	3.8	100
Lead	ND		0.019	1.0

*CPH*

11/3/2011

Blanks 180-1780.xls  
Total Metals

Blank ID	Analyte	Blank Conc	Units	Blank*10 or Blank*5	Units	Samples	Sample Conc	Units	Qualify?
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Calcium	27.9	ug/L	139.5	ug/L	MSB-3	110000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Calcium	27.9	ug/L	139.5	ug/L	MSB-4	110000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Calcium	27.9	ug/L	139.5	ug/L	MSB-4D	110000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Calcium	27.9	ug/L	139.5	ug/L	MSB-6	77000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Calcium	27.9	ug/L	139.5	ug/L	EB-1-070711	26	ug/L	*
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Magnesium	3.55	ug/L	17.75	ug/L	MSB-3	60000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Magnesium	3.55	ug/L	17.75	ug/L	MSB-4	54000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Magnesium	3.55	ug/L	17.75	ug/L	MSB-4D	56000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Magnesium	3.55	ug/L	17.75	ug/L	MSB-6	45000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Magnesium	3.55	ug/L	17.75	ug/L	EB-1-070711	8.2	ug/L	*
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Manganese	0.116	ug/L	0.58	ug/L	MSB-3	1700	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Manganese	0.116	ug/L	0.58	ug/L	MSB-4	2500	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Manganese	0.116	ug/L	0.58	ug/L	MSB-4D	2500	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Manganese	0.116	ug/L	0.58	ug/L	MSB-6	1800	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Manganese	0.116	ug/L	0.58	ug/L	EB-1-070711	0.6	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Potassium	41.9	ug/L	209.5	ug/L	MSB-3	2100	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Potassium	41.9	ug/L	209.5	ug/L	MSB-4	1300	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Potassium	41.9	ug/L	209.5	ug/L	MSB-4D	1300	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Potassium	41.9	ug/L	209.5	ug/L	MSB-6	2500	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Potassium	41.9	ug/L	209.5	ug/L	EB-1-070711	11	ug/L	*
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Sodium	39	ug/L	195	ug/L	MSB-3	38000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Sodium	39	ug/L	195	ug/L	MSB-4	30000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Sodium	39	ug/L	195	ug/L	MSB-4D	31000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Sodium	39	ug/L	195	ug/L	MSB-6	38000	ug/L	
Initial Calibration Blank (ICBS 180-7315/6; 7/13/2011; 14:45)	Sodium	39	ug/L	195	ug/L	EB-1-070711	180	ug/L	*
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Lead	0.02	ug/L	0.1	ug/L	MSB-3	2	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Lead	0.02	ug/L	0.1	ug/L	MSB-4	0.022	ug/L	*
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Lead	0.02	ug/L	0.1	ug/L	MSB-4D	0.031	ug/L	*
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Lead	0.02	ug/L	0.1	ug/L	MSB-6	2.1	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Lead	0.02	ug/L	0.1	ug/L	EB-1-070711	ND	ug/L	

*CPH*

Blanks 180-1780.xls  
Total Metals

Blank ID	Analyte	Blank Conc	Units	Blank*10 or Blank*5	Units	Samples	Sample Conc	Units	Qualify?
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Magnesium	9.52	ug/L	47.6	ug/L	MSB-3	60000	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Magnesium	9.52	ug/L	47.6	ug/L	MSB-4	54000	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Magnesium	9.52	ug/L	47.6	ug/L	MSB-4D	56000	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Magnesium	9.52	ug/L	47.6	ug/L	MSB-6	45000	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Magnesium	9.52	ug/L	47.6	ug/L	EB-1-070711	8.2	ug/L	*
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Manganese	0.213	ug/L	1.065	ug/L	MSB-3	1700	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Manganese	0.213	ug/L	1.065	ug/L	MSB-4	2500	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Manganese	0.213	ug/L	1.065	ug/L	MSB-4D	2500	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Manganese	0.213	ug/L	1.065	ug/L	MSB-6	1800	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Manganese	0.213	ug/L	1.065	ug/L	EB-1-070711	0.6	ug/L	*
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Potassium	16.8	ug/L	84	ug/L	MSB-3	2100	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Potassium	16.8	ug/L	84	ug/L	MSB-4	1300	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Potassium	16.8	ug/L	84	ug/L	MSB-4D	1300	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Potassium	16.8	ug/L	84	ug/L	MSB-6	2500	ug/L	
Continuing Calibration Blank (CCB8 180-7315/94; 7/13/2011; 22:20)	Potassium	16.8	ug/L	84	ug/L	EB-1-070711	11	ug/L	*
Method Blank (MB 180-6976/1-A)	Iron	8.77	ug/L	43.85	ug/L	MSB-3	25000	ug/L	
Method Blank (MB 180-6976/1-A)	Iron	8.77	ug/L	43.85	ug/L	MSB-4	18000	ug/L	
Method Blank (MB 180-6976/1-A)	Iron	8.77	ug/L	43.85	ug/L	MSB-4D	19000	ug/L	
Method Blank (MB 180-6976/1-A)	Iron	8.77	ug/L	43.85	ug/L	MSB-6	21000	ug/L	
Method Blank (MB 180-6976/1-A)	Iron	8.77	ug/L	43.85	ug/L	EB-1-070711	29	ug/L	*
Method Blank (MB 180-6976/1-A)	Potassium	7.51	ug/L	37.55	ug/L	MSB-3	2100	ug/L	
Method Blank (MB 180-6976/1-A)	Potassium	7.51	ug/L	37.55	ug/L	MSB-4	1300	ug/L	
Method Blank (MB 180-6976/1-A)	Potassium	7.51	ug/L	37.55	ug/L	MSB-4D	1300	ug/L	
Method Blank (MB 180-6976/1-A)	Potassium	7.51	ug/L	37.55	ug/L	MSB-6	2500	ug/L	
Method Blank (MB 180-6976/1-A)	Potassium	7.51	ug/L	37.55	ug/L	EB-1-070711	11	ug/L	*
Method Blank (MB 180-6976/1-A)	Manganese	0.098	ug/L	0.49	ug/L	MSB-3	1700	ug/L	
Method Blank (MB 180-6976/1-A)	Manganese	0.098	ug/L	0.49	ug/L	MSB-4	2500	ug/L	
Method Blank (MB 180-6976/1-A)	Manganese	0.098	ug/L	0.49	ug/L	MSB-4D	2500	ug/L	
Method Blank (MB 180-6976/1-A)	Manganese	0.098	ug/L	0.49	ug/L	MSB-6	1800	ug/L	
Method Blank (MB 180-6976/1-A)	Manganese	0.098	ug/L	0.49	ug/L	EB-1-070711	0.6	ug/L	

\* Sample Concentration is < 10X (or 5X) blank concentration, Qualified as "U"

*CPH*  
11/3/2011

3-IN  
INSTRUMENT BLANKS  
METALS

Lab Name: TestAmerica Pittsburgh Job No.: 180-1780-1

SDG No.: \_\_\_\_\_

Concentration Units: ug/L

Analyte	RL	ICBIS 180-7315/6 07/13/2011 14:45		CCB 180-7315/11 07/13/2011 15:13		CCB8 180-7315/94 07/13/2011 22:20		CCB9 180-7315/106 07/13/2011 23:18	
		Found	C	Found	C	Found	C	Found	C
<b>Calcium</b>	100	* 27.9	J	ND		ND		ND	
<b>Iron</b>	50	ND		NA 6.14	J	ND		NA 7.91	J
<b>Lead</b>	1.0	ND		ND		* 0.0200	J	NA 0.0390	J
<b>Magnesium</b>	100	* 3.55	J	ND		* 9.52	J	NA 9.73	J
<b>Manganese</b>	0.50	* 0.116	J	ND		* 0.213	J	NA 0.241	J
<b>Potassium</b>	100	* 41.9	J	NA 9.61	J	* 16.8	J	NA 16.5	J
<b>Sodium</b>	100	* 39.0	J	NA 6.01	J	ND		ND	

NA = No associated samples

\* = Associated samples: MSB-3, MSB-4, MSB-4D, MSB-6, EB-1-070711

*CPH*

*11/3/2011*

3-IN  
INSTRUMENT BLANKS  
METALS

Lab Name: TestAmerica Pittsburgh Job No.: 180-1780-1

SDG No.: \_\_\_\_\_

Concentration Units: mg/L

Analyte	RL	ICBIS 180-7546/6 07/15/2011 14:42		CCB 180-7546/11 07/15/2011 15:09		Found	C	Found	C
		Found	C	Found	C				
<i>Calcium hardness as calcium carbonate</i>	0.25		ND	NA	0.0116		J		

NA = No associated samples

*CPH*  
11/3/2011

3-IN  
INSTRUMENT BLANKS  
METALS

Lab Name: TestAmerica Pittsburgh Job No.: 180-1780-1

SDG No.: \_\_\_\_\_

Concentration Units: ug/L

Analyte	RL	ICBIS 180-7546/6 07/15/2011 14:42		CCB 180-7546/11 07/15/2011 15:09		Found	C	Found	C
		Found	C	Found	C				
<b>Calcium</b>	100	NA	2.83	J	NA	4.65	J		
<b>Iron</b>	50	NA	12.1	J	NA	22.7	J		
<b>Lead</b>	1.0		ND			ND			
<b>Magnesium</b>	100	NA	4.14	J	NA	4.36	J		
<b>Manganese</b>	0.50		ND		NA	0.0420	J		
<b>Potassium</b>	100		ND			ND			
<b>Sodium</b>	100		ND			ND			

NA = No associated samples

*CPH*

*11/3/2011*

3-IN  
METHOD BLANK  
METALS

Lab Name: TestAmerica Pittsburgh Job No.: 180-1780-1

SDG No.: \_\_\_\_\_

Concentration Units: ug/L Lab Sample ID: MB 180-6976/1-A

Instrument Code: M Batch No.: 7315

CAS No.	Analyte	Concentration	C	Q	Method
7440-70-2	Calcium	ND			6020
7439-89-6	Iron *	8.77	J		6020
7440-09-7	Potassium *	7.51	J		6020
7439-95-4	Magnesium	ND			6020
7439-96-5	Manganese *	0.0980	J		6020
7440-23-5	Sodium	ND			6020
7439-92-1	Lead	ND			6020

\* = Associated samples: MSB-3, MSB-4, MSB-4D, MSB-6, EB-1-070711

Site Name: Marjol  
Project Number: 92-002-221

Laboratory: Test America - Pittsburgh  
Matrix: Groundwater

Field Duplicates

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Calcium	ug/L	110000		100		
MSB-4D	Calcium	ug/L	110000		100	0.00	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Iron	ug/L	18000	B	50		
MSB-4D	Iron	ug/L	19000	B	50	5.41	no

Sample ID	Analyte	Units	Result	Q	RL	Difference	Qualify?
MSB-4	Lead	ug/L	0.022	J	1		
MSB-4D	Lead	ug/L	0.031	J	1	0.01	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Magnesium	ug/L	54000		100		
MSB-4D	Magnesium	ug/L	56000		100	3.64	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Manganese	ug/L	2500	B	0.5		
MSB-4D	Manganese	ug/L	2500	B	0.5	0.00	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Potassium	ug/L	1300	B	100		
MSB-4D	Potassium	ug/L	1300	B	100	0.00	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Sodium	ug/L	30000		100		
MSB-4D	Sodium	ug/L	31000		100	3.28	no

Duplicate Criteria: Aqueous matrices <30 % RPD or < ± 1\*RL, Soil/Solid matrices <40 %RPD or < ± 2\*RL.

\* - Denotes %RPD or difference outside criteria.

NA - Duplicate relative percent difference or difference cannot be calculated.

U / ND - Not detected.

*CPH*

## WET CHEMISTRY DATA VALIDATION SUMMARY

Site Name: Marjol  
 Project Number: 92-002-324  
 Sampling Date(s): 7/7/2011

Laboratory: Test America - Pittsburgh  
 Case /Order No.: 180-1780

Parameter List: Alkalinity (Total, Bicarbonate, Carbonate), pH, Sulfate  
 Method: SM2320B, SM4500H+B, MCAWW 300.0

The following table indicates the data validation criteria examined, any problems identified, and the QA action applied.

Data Validation Criteria:	accept	FYI	qualify	Comments
Holding Times			X	pH
Calibration Curve	X			
Initial Calibration	X			
Continuing Calibration	X			
Laboratory Control Sample Results	X			
Blank Analysis Results			X	
Duplicate Analysis Results				NA
Field Duplicate Analysis Results	X			MSB-4/ MSB-4D
Matrix Spike Analysis Results				NA
Quantitation/Detection Limits	X			
Overall Assessment of Data	X			
Other:				

General Comments: Cooler Temp: 1.7°C

Accept - No qualification required.  
 FYI - For your information only, no qualification necessary.  
 Qualify - Qualify as rejected, estimated or biased  
 NA - Not applicable

QA Scientist *Chica Nicholson*  
 Date 11/3/2011

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

General Chemistry

Client Sample ID: MSB-3

Lab Sample ID: 180-1780-1

Date Sampled: 07/07/2011 0936

Client Matrix: Water

Date Received: 07/08/2011 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate	360	B	mg/L	2.1	10	10	300.0
	Analysis Batch: 180-6845	Analysis Date: 07/08/2011 2047					
Bicarbonate Alkalinity as CaCO3	130	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1114					
Carbonate Alkalinity as CaCO3	ND		mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1114					
Alkalinity	130	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1114					
pH	6.18	HF J	SU	0.100	0.100	1.0	SM 4500 H+ B
	Analysis Batch: 180-6727	Analysis Date: 07/08/2011 1622					

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11/3/2011

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

General Chemistry

Client Sample ID: MSB-4

Lab Sample ID: 180-1780-2

Date Sampled: 07/07/2011 1200

Client Matrix: Water

Date Received: 07/08/2011 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate	300	B	mg/L	2.1	10	10	300.0
	Analysis Batch: 180-6845	Analysis Date: 07/08/2011 2115					
Bicarbonate Alkalinity as CaCO3	170	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1123					
Carbonate Alkalinity as CaCO3	ND		mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1123					
Alkalinity	170	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1123					
pH	6.32	H F J	SU	0.100	0.100	1.0	SM 4500 H+ B
	Analysis Batch: 180-6727	Analysis Date: 07/08/2011 1623					

*CPH*

*11/3/2011*

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

General Chemistry

Client Sample ID: MSB-4D

Lab Sample ID: 180-1780-3

Date Sampled: 07/07/2011 1230

Client Matrix: Water

Date Received: 07/08/2011 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate	300	B	mg/L	2.1	10	10	300.0
	Analysis Batch: 180-6845	Analysis Date: 07/08/2011 2211					
Bicarbonate Alkalinity as CaCO3	170	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1133					
Carbonate Alkalinity as CaCO3	ND		mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1133					
Alkalinity	170	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1133					
pH	6.31	HF J	SU	0.100	0.100	1.0	SM 4500 H+ B
	Analysis Batch: 180-6727	Analysis Date: 07/08/2011 1624					

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11/3/2011

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

General Chemistry

Client Sample ID: MSB-6

Lab Sample ID: 180-1780-4

Date Sampled: 07/07/2011 1526

Client Matrix: Water

Date Received: 07/08/2011 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate	220	B	mg/L	2.1	10	10	300.0
	Analysis Batch: 180-6845	Analysis Date: 07/08/2011 2239					
Bicarbonate Alkalinity as CaCO3	120	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1142					
Carbonate Alkalinity as CaCO3	ND		mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1142					
Alkalinity	120	B	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293	Analysis Date: 07/14/2011 1142					
pH	6.28	HFJ	SU	0.100	0.100	1.0	SM 4500 H+ B
	Analysis Batch: 180-6727	Analysis Date: 07/08/2011 1626					

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11/3/2011

Client: Advanced GeoServices Corporation

Job Number: 180-1780-1

General Chemistry

Client Sample ID: EB-1-070711

Lab Sample ID: 180-1780-5

Date Sampled: 07/07/2011 1645

Client Matrix: Water

Date Received: 07/08/2011 1000

Analyte	Result	Qual	Units	MDL	RL	Dil	Method
Sulfate	1.0 <del>0.62</del>	<del>JB</del> U	mg/L	0.21	1.0	1.0	300.0
	Analysis Batch: 180-6845			Analysis Date: 07/08/2011 2253			
Bicarbonate Alkalinity as CaCO3	5.0 <del>1.4</del>	<del>JB</del> U	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293			Analysis Date: 07/14/2011 1148			
Carbonate Alkalinity as CaCO3	ND		mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293			Analysis Date: 07/14/2011 1148			
Alkalinity	5.0 <del>1.4</del>	<del>JB</del> U	mg/L	0.41	5.0	1.0	SM 2320B
	Analysis Batch: 180-7293			Analysis Date: 07/14/2011 1148			
pH	6.93	<del>HF</del>	SU	0.100	0.100	1.0	SM 4500 H+ B
	Analysis Batch: 180-6727			Analysis Date: 07/08/2011 1627			

*CPH*

*11/3/2011*

**HOLDING TIMES**  
**180-1780 - WC**

Site Name: Marjol

Conventionals

Sample ID Field	Lab	Analyte	Matrix	Sample Date	Date of Analysis	Hold Time	DA	QA Decision
MSB-3	180-1780-1	Alkalinity - Bicarbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Carbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Total	Groundwater	7/7/2011	7/14/2011	14 days	7	
		pH	Groundwater	7/7/2011	7/8/2011	24 hours	1 day; 6 hours; 46 minutes	*
		Sulfate	Groundwater	7/7/2011	7/8/2011	28 days	1	
MSB-4	180-1780-2	Alkalinity - Bicarbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Carbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Total	Groundwater	7/7/2011	7/14/2011	14 days	7	
		pH	Groundwater	7/7/2011	7/8/2011	24 hours	1 day; 4 hours; 23 minutes	*
		Sulfate	Groundwater	7/7/2011	7/8/2011	28 days	1	
MSB-4D	180-1780-3	Alkalinity - Bicarbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Carbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Total	Groundwater	7/7/2011	7/14/2011	14 days	7	
		pH	Groundwater	7/7/2011	7/8/2011	24 hours	1 day; 3 hours; 54 minutes	*
		Sulfate	Groundwater	7/7/2011	7/8/2011	28 days	1	
MSB-6	180-1780-4	Alkalinity - Bicarbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Carbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Total	Groundwater	7/7/2011	7/14/2011	14 days	7	
		pH	Groundwater	7/7/2011	7/8/2011	24 hours	1 day; 1 hour	*
		Sulfate	Groundwater	7/7/2011	7/8/2011	28 days	1	
EB-1-070711	180-1780-5	Alkalinity - Bicarbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Carbonate	Groundwater	7/7/2011	7/14/2011	14 days	7	
		Alkalinity - Total	Groundwater	7/7/2011	7/14/2011	14 days	7	
		pH	Groundwater	7/7/2011	7/8/2011	24 hours	1	
		Sulfate	Groundwater	7/7/2011	7/8/2011	28 days	1	

**Note:**

**DA = Number of days elapsed from sampling to analysis.**

*CPH*

*11/3/2011*

Blanks 180-1780.xls  
Conventionals

Blank ID	Analyte	Blank Conc	Units	Blank*10 or Blank*5	Units	Samples	Sample Conc	Units	Qualify?
Continuing Calibration Blank (CCB3 180-6845/33; 7/8/2011; 21:57)	Sulfate	0.545	mg/L	2.725	mg/L	MSB-4D	300	mg/L	
Continuing Calibration Blank (CCB3 180-6845/33; 7/8/2011; 21:57)	Sulfate	0.545	mg/L	2.725	mg/L	MSB-6	220	mg/L	
Continuing Calibration Blank (CCB3 180-6845/33; 7/8/2011; 21:57)	Sulfate	0.545	mg/L	2.725	mg/L	EB-1-070711	0.62	mg/L	*
Method Blank (MB 180-7293/2)	Alkalinity - Bicarbonate	1.86	mg/L	9.3	mg/L	MSB-3	130	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Carbonate	0.88	mg/L	4.4	mg/L	MSB-3	ND	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Total	2.74	mg/L	13.7	mg/L	MSB-3	130	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Bicarbonate	1.86	mg/L	9.3	mg/L	MSB-4	170	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Carbonate	0.88	mg/L	4.4	mg/L	MSB-4	ND	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Total	2.74	mg/L	13.7	mg/L	MSB-4	170	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Bicarbonate	1.86	mg/L	9.3	mg/L	MSB-4D	170	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Carbonate	0.88	mg/L	4.4	mg/L	MSB-4D	ND	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Total	2.74	mg/L	13.7	mg/L	MSB-4D	170	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Bicarbonate	1.86	mg/L	9.3	mg/L	MSB-6	120	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Carbonate	0.88	mg/L	4.4	mg/L	MSB-6	ND	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Total	2.74	mg/L	13.7	mg/L	MSB-6	120	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Bicarbonate	1.86	mg/L	9.3	mg/L	EB-1-070711	1.4	mg/L	*
Method Blank (MB 180-7293/2)	Alkalinity - Carbonate	0.88	mg/L	4.4	mg/L	EB-1-070711	ND	mg/L	
Method Blank (MB 180-7293/2)	Alkalinity - Total	2.74	mg/L	13.7	mg/L	EB-1-070711	1.4	mg/L	*

\* Sample Concentration is < 10X (or 5X) blank concentration, Qualified as "U"

*CPH*

11/3/2011

2-IN  
 CALIBRATION QUALITY CONTROL  
 GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-1780-1  
 SDG No.: \_\_\_\_\_  
 Analyst: lw Batch Start Date: 07/08/2011  
 Reporting Units: mg/L Analytical Batch No.: 6845

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
2	ICV	10:54	Sulfate	58.7	60.0	98	90-110		ICICV_00055
3	CCV	11:08	Sulfate	47.8	50.0	96	90-110		ICCCV_00050
NA	4	CCB	11:22	Sulfate	0.549			J	
14	CCV	13:49	Sulfate	47.9	50.0	96	90-110		ICCCV_00050
NA	15	CCB	14:03	Sulfate	0.572			J	
25	CCV	19:40	Sulfate	47.3	50.0	95	90-110		ICCCV_00050
26	CCB	20:05	Sulfate	ND					
32	CCV	21:43	Sulfate	47.4	50.0	95	90-110		ICCCV_00050
*	33	CCB	21:57	Sulfate	0.545			J	
44	CCV	06:25	Sulfate	47.4	50.0	95	90-110		ICCCV_00050
45	CCB	06:39	Sulfate	ND					

NA = No associated samples

\* = Associated samples: MSB-4D, MSB-6, EB-1-070711

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM II-IN

*lw*

11/3/2011

2-IN  
 CALIBRATION QUALITY CONTROL  
 GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh Job No.: 180-1780-1  
 SDG No.: \_\_\_\_\_  
 Analyst: CL Batch Start Date: 07/14/2011  
 Reporting Units: mg/L Analytical Batch No.: 7293

Sample Number	QC Type	Time	Analyte	Result	Spike Amount	(%) Recovery	Limits	Qual	Reagent
11	CCV	11:56	Alkalinity	27.3	32.6	84	80-120		WALKCCV_00007
NA 12	CCB	12:05	Bicarbonate Alkalinity as CaCO3	0.950				J	
			Carbonate Alkalinity as CaCO3	ND					
			Alkalinity	0.950				J	

NA = No associated samples

Note! Calculations are performed before rounding to avoid round-off errors in calculated results.

*CL*

11/3/2011

3-IN  
METHOD BLANK  
GENERAL CHEMISTRY

Lab Name: TestAmerica Pittsburgh

Job No.: 180-1780-1

SDG No.: \_\_\_\_\_

Method	Lab Sample ID	Analyte	Result	Qual	Units	RL	Dil
Batch ID: 6845		Date: 07/08/2011 11:51					
* 300.0	MB 180-6845/6	Sulfate	0.554	J	mg/L	1.0	1
Batch ID: 7293		Date: 07/14/2011 10:38					
* SM 2320B	MB 180-7293/2	Bicarbonate Alkalinity as CaCO3	1.86	J	mg/L	5.0	1
* SM 2320B	MB 180-7293/2	Carbonate Alkalinity as CaCO3	0.880	J	mg/L	5.0	1
* SM 2320B	MB 180-7293/2	Alkalinity	2.74	J	mg/L	5.0	1

\* = Associated samples: MSB-3, MSB-4, MSB-4D, MSB-6, EB-1-070711

*CPH*  
11/3/2011

Site Name: Marjol  
Project Number: 92-002-221

Laboratory: Test America - Pittsburgh  
Matrix: Groundwater

Field Duplicates

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Alkalinity	mg/L	170	B	5		
MSB-4D	Alkalinity	mg/L	170	B	5	0.00	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Bicarbonate Alkalinity	mg/L	170	B	5		
MSB-4D	Bicarbonate Alkalinity	mg/L	170	B	5	0.00	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	pH	pH units	6.32	HF	0.1		
MSB-4D	pH	pH units	6.31	HF	0.1	0.16	no

Sample ID	Analyte	Units	Result	Q	RL	RPD	Qualify?
MSB-4	Sulfate	mg/L	300	B	10		
MSB-4D	Sulfate	mg/L	300	B	10	0.00	no

Duplicate Criteria: Aqueous matrices <30 % RPD or < ± 1\*RL, Soil/Solid matrices <40 %RPD or < ± 2\*RL.

\* - Denotes %RPD or difference outside criteria.

NA - Duplicate relative percent difference or difference cannot be calculated.

U / ND - Not detected.

*CPH*

11/3/2011