Department of Energy
Washington, DC 20585

March 5, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Deputy Director
Mail Stop T8F5
Washington, DC 20555-0001

Subject: November 2012 Water Sampling at the Bluewater, New Mexico, Disposal Site

To Whom It May Concern:

Enclosed is the U.S. Department of Energy, Office of Legacy Management (DOE-LM) report on groundwater quality data obtained as a result of our sampling event conducted at the Bluewater, New Mexico, disposal site in November 2012. Validation of the data was recently completed and the report is ready for distribution. The report includes analytical data from DOE-LM's onsite monitoring wells, including the new wells constructed during 2011 and 2012, in addition to a private well near the site.

Uranium concentrations in a point-of-compliance alluvium well continue to exceed the U.S. Nuclear Regulatory Commission (NRC)-approved alternate concentration limit (ACL) of 0.44 milligrams per liter (mg/L), and uranium concentrations in alluvium wells at the site boundary continue to exceed State of New Mexico drinking water standard of 0.03 mg/L. The uranium concentration in a sample collected from the nearest downgradient private well was 0.00454 mg/L.

No uranium concentrations from samples collected in wells monitoring the San Andres/Glorieta aquifer exceeded the NRC-approved ACL of 2.15 mg/L. However, uranium concentrations in new wells at the site boundary, sampled for the first time during this sampling event, exceeded the State of New Mexico drinking water standard.

These results indicate that groundwater contaminated by former milling operations is leaving the site, but the extent of contamination is unknown. DOE-LM understands the magnitude of this occurrence and has begun to evaluate the associated potential risk. At this time, there is no known risk to human health, based on groundwater quality data collected by the New Mexico Environment Department (NMED) in their May 2010 draft report *Geochemical Analysis and Interpretation of Ground Water Data Collected as part of the Anaconda Company Bluewater Uranium Mill Site Investigation (CERCLIS ID NMD007106891) and San Mateo Creek Site Legacy Uranium Sites Investigation (CERCLIS ID NMN00060684)*. Groundwater quality analyses from this report represent sampling from wells generally downgradient from the Bluewater site, and the analyses contained in the report do not demonstrate elevated uranium concentrations. However, to further characterize the potential for risk to human health and the environment, DOE-LM is planning to immediately commence or has already initiated the following activities:

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- The site well network was resampled in January 2013; DOE-LM samples the network a minimum of two times per year.
- Under a cooperative agreement between DOE-LM and NMED, NMED has agreed to assist DOE-LM by compiling information on all wells in the vicinity of the Bluewater site. This information will be used to help DOE-LM identify hydrologic data sources already available to be used in better understanding hydrogeological characteristics beyond the Bluewater site, to decide which private wells should be sampled by DOE-LM, and to determine the locations for installing new offsite monitoring wells, if needed.
- Groundwater data collected by DOE-LM, including the most recent data, will continue to be evaluated to characterize site groundwater quality and flow directions, and evaluate any potential risk to offsite users of the groundwater.
- Historical groundwater information pertaining to water quality and aquifer modeling developed by the former mill operator (Anaconda Minerals Company/Atlantic Richfield Company) is being retrieved for evaluation to help DOE-LM understand what is occurring at and beyond the site at this time and what might occur in the future.
- DOE-LM will investigate the source of the contaminated groundwater, focusing on whether the contaminated groundwater represents a downgradient migration of a contaminant plume originating from historic milling operations, and/or the uranium mill tailings disposal cell is contributing to the contamination.

These results are available on DOE-LM's website. DOE-LM will also notify state stakeholders of these groundwater results and the activities described above, and will support the NRC in conducting a public meeting in Grants, New Mexico, if the NRC deems it necessary.

Please call me at (970) 248-6550 if you have any questions regarding this letter or the enclosed report, or would like to schedule a meeting or telephone conference. Please send any correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,

Deborah Barr
Site Manager

Enclosure

cc w/enclosure:
J. Buckley, NRC
P. Bustamante, NMED
D. Mayerson, NMED
D. Geiser, DOE-LM
A. Gil, DOE-LM
D. Shafer, DOE-LM

cc w/o enclosure:
C. Carpenter, Stoller (e)
D. Johnson, Stoller (e)
File: BLU 410.02(A)

\Sites\Bluewater\2-28-13 Bluewater DVP November 2012 Letter

Data Validation Package

November 2012
Water Sampling at the
Bluewater, New Mexico, Disposal Site

February 2013

U.S. DEPARTMENT OF ENERGY
Legacy Management

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Sampling Event Summary

Site: Bluewater, New Mexico, Disposal Site

Sampling Period: November 13-15, 2012

Groundwater samples were collected from monitoring wells at the Bluewater, New Mexico, Disposal Site to monitor groundwater contaminants as specified in the 1997 *Long-Term Surveillance Plan for the DOE Bluewater (UMTRCA Title II) Disposal Site Near Grants, New Mexico* (LTSP). Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated). One duplicate sample was collected from monitoring well Y2(M).

Alluvium wells are completed in the alluvial sediments in the former channel of the Rio San Jose, which was covered by basalt lava flows known as the El Malpais, and are identified by the suffix (M). Bedrock wells are completed in the San Andres Limestone/Glorieta Sandstone hydrologic unit and are identified by the suffix (SG). Well OBS-3 is also completed in the San Andres/Glorieta aquifer.

The LTSP requires monitoring for molybdenum, selenium, uranium, and polychlorinated biphenyls (PCBs); PCB monitoring occurs only during November sampling events. This event included sampling for an expanded list of analytes to support a regional groundwater investigation being conducted by the New Mexico Environment Department.

Alluvium wells 21(M) and 22(M) were installed downgradient of point-of-compliance (POC) well T(M) in summer 2011; well 21(M) is located near the site boundary where alluvial groundwater apparently leaves the site. These wells were installed in response to the exceedance of the alternate concentration limit (ACL) for uranium in well T(M) during previous sampling events. Well 20(M) was installed upgradient of well T(M) in summer 2012, and is located near the site boundary where alluvial groundwater apparently enters the site. Sediment that had accumulated in point-of-exposure (POE) well X(M), located near the site boundary, was cleaned out in 2012; the well was sampled for the first time during this event. POC well T(M) could not be sampled because it was dry (the water level has decreased approximately 9 feet since the U.S. Department of Energy (DOE) began sampling the well in 1997). Alluvium well 23(M), installed in summer 2012 near the site entrance, was also dry.

Analytical results for the required constituents for the alluvium wells are provided in Table 1. The uranium concentration was 0.134 milligrams per liter (mg/L) in POE well X(M), and was 0.132 mg/L in well 21(M); both concentrations exceed the Uranium Mill Tailings Radiation Control Act (UMTRCA) maximum concentration limit (MCL) of 0.044 mg/L (40 CFR 192, Table 1). Therefore, contaminated alluvial groundwater is leaving the site; this occurrence is being evaluated by DOE in consultation with the U.S. Nuclear Regulatory Commission.

Table 1. November 2012 Groundwater Monitoring Analytical Results for the Alluvium Wells

Location	Category	Molybdenum (mg/L) ACL=0.10 mg/L	Selenium (mg/L) ACL=0.05 mg/L	Uranium (mg/L) ACL=0.44 mg/L
20(M)	Upgradient	0.0019	0.0047	0.0197
21(M)	Downgradient	0.0009	0.0106	0.132
22(M)	Downgradient	0.0008	0.0056	0.315
E(M)	Background	0.0004	ND	ND
F(M)	POC	0.001	ND	0.0086
X(M)	POE	0.0007	0.0073	0.134
Y2(M)	PCBs	0.0017	ND	0.0055

Key: ACL = alternate concentration limit; mg/L = milligrams per liter; ND = not detected;
PCB = polychlorinated biphenyls well; POC = point-of-compliance well; POE = point-of-exposure well

Because of the elevated uranium concentrations in the alluvial aquifer, DOE began sampling the Simpson well in May 2012. This is a private well located south and presumably downgradient of the site. The well record indicates that it may be completed in an aquifer of the Chinle Formation, which occurs between the alluvium and the San Andres Limestone. The uranium concentration for this sampling event was 0.0045 mg/L.

Bedrock wells 11(SG), 13(SG), 14(SG), 15(SG), 16(SG), and 18(SG) were installed in summer 2012 to support New Mexico Environment Department's regional groundwater investigation, to gain a better understanding of the hydrogeological characteristics of the San Andres/Glorieta aquifer at the site, and because a nearby off-site private well completed in the same aquifer indicated elevated uranium concentrations. There were no bedrock wells in the south portion of the site prior to this well construction project. Well 14(SG) is considered to be upgradient of the disposal cells, and all of the other new wells are downgradient of the cells. Well 16(SG) was installed between POC wells OBS-3 and S(SG) because of the poor condition of those wells (their well screens are highly corroded). All of the new wells were sampled for the first time during this event.

Analytical results for the required constituents for the bedrock wells are provided in Table 2. The selenium and uranium concentrations did not exceed ACLs in the POC wells, and no constituents exceeded their respective UMTRCA MCLs at POE well I(SG). However, the uranium concentration in upgradient well 14(SG) equals the UMTRCA MCL, and the uranium concentrations in downgradient wells 13(SG) and 18(SG), located along the site boundary, substantially exceed the UMTRCA MCL. Therefore, contaminated San Andres/Glorieta aquifer groundwater is leaving the site; this occurrence will be evaluated by DOE in consultation with the U.S. Nuclear Regulatory Commission.

Table 2. November 2012 Groundwater Monitoring Analytical Results for the Bedrock Wells

Location	Category	Selenium (mg/L) ACL=0.05 mg/L	Uranium (mg/L) ACL=2.15 mg/L
11(SG)	Downgradient	ND	0.0239
13(SG)	Downgradient	0.00639	0.116
14(SG)	Upgradient	ND	0.0437
15(SG)	Downgradient	ND	0.0743
16(SG)	Downgradient	0.0196	1.43
18(SG)	Downgradient	0.0051	0.207
I(SG)	POE	ND	0.00276
L(SG)	Background	ND	0.00316
OBS-3	POC	ND	0.0106
S(SG)	POC	0.012	0.367

Key: ACL = alternate concentration limit; mg/L = milligrams per liter; ND = not detected; POC = point-of-compliance well; POE = point-of-exposure well

Richard K. Johnson
Site Lead, S.M. Stoller Corporation

2/6/13
Date

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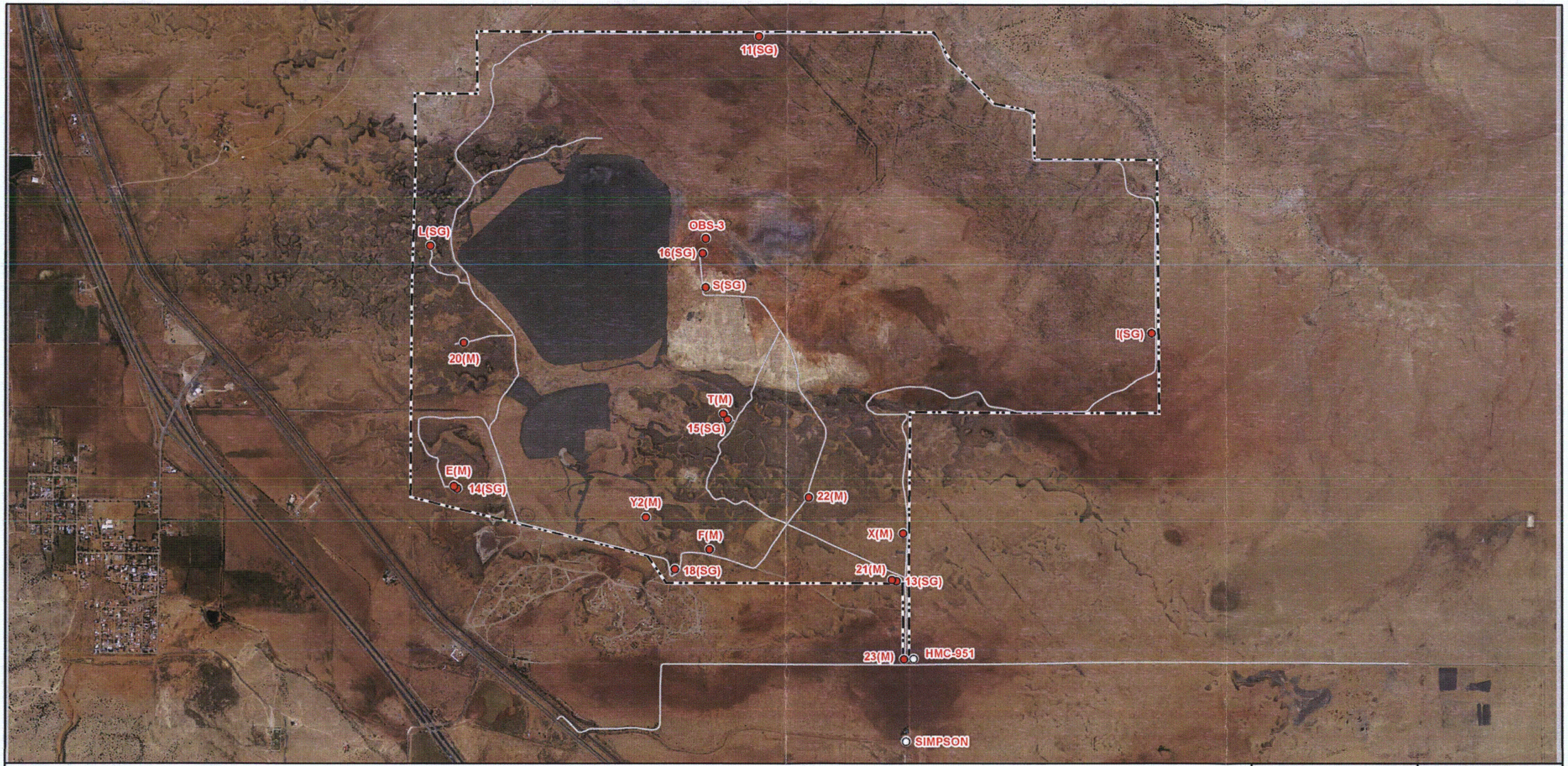

Sample Location Map, Bluewater, New Mexico, Disposal Site

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Bluewater, New Mexico	**Date(s) of Water Sampling**	Nov 13-15, 2012
Date(s) of Verification	January 11, 2013	**Name of Verifier**	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work Order Letter dated October 16, 2012. Program Directive No. BLU-2013-01.
2. Were the sampling locations specified in the planning documents sampled?	No	Locations 23(M) and T(M) were dry.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration performed on November 8, 2012. [pH pre-trip calibration: at 181.9, the span was slightly above range (165-180), which is acceptable.]
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	No	DO was not collected at location "Simpson."
6. Was the category of the well documented?	Yes	Some wells (Simpson, S(SG), E(M)) were mis-categorized by the samplers. These locations were sampled correctly.
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	A bladder pump was installed at 16(SG). There was a 6+ hour delay between installation and sampling.

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	S(SG) and OBS-3 are purged and sampled according to the program directive. Three casing volumes are purged (or purged to dryness) then one set of parameters is recorded before collecting the sample. No stabilization was required.
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected for location Y2(M).
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	An equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?		
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	Turbidity was >10 NTU at OBS-3; samples were filtered per the SAP.
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	Details of the purge at S(SG) were documented in the trip report.
19. Was the presence or absence of ice in the cooler documented at every sample location?	No	Presence of ice was not documented at location 22(M).
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	12114945
Sample Event:	November 13-15, 2012
Site(s):	Bluewater, New Mexico
Laboratory:	GEL Laboratories, Charleston, South Carolina
Work Order No.:	315419
Analysis:	Metals, Organics, and Wet Chemistry
Validator:	Gretchen Baer
Review Date:	January 11, 2013

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/PRO/S04325, continually updated) "Standard Practice for Validation of Laboratory Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Alkalinity, Bicarbonate	WCH-A-003	EPA 310.1/ SM 2320B	EPA 310.1/ SM 2320B
Alkalinity, Carbonate	WCH-A-004	EPA 310.1/ SM 2320B	EPA 310.1/ SM 2320B
Chloride, Sulfate	MIS-A-045	EPA 300.0	EPA 300.0
Calcium, Magnesium, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010B
Arsenic, Molybdenum, Selenium, Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
PCBs	PEP-A-006	SW-846 3535A	SW-846 8082
Total Dissolved Solids	WCH-A-033	SM 2540C	SM 2540C

Data Qualifier Summary

Analytical results were qualified as listed in Table 4. Refer to the sections below for an explanation of the data qualifiers applied.

Table 4. Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
All	All	Potassium	J	Serial dilution has positive bias
315419-003	Y2(M)	Chloride	J	Field duplicate RSD greater than 20%
315419-009	Y2(M) dup, 2074	Chloride	J	Field duplicate RSD greater than 20%

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received 19 water samples on November 16, 2012, accompanied by a Chain of Custody form. The air bill numbers were listed in the receiving documentation. The Chain of Custody form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody form was complete with no errors or omissions, with the following exception. The filtration status for sample OBS-3 was not described correctly.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The practical quantitation limit (PQL) for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. All calibration and laboratory spike standards were prepared from independent sources.

Method EPA 300.0
Calibrations for chloride and sulfate were performed using seven calibration standards on November 7, 2012. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in six verification checks. All calibration checks met the acceptance criteria.

Methods EPA 310.1/ SM 2320B, SM 2540C
There are no initial or continuing calibration requirements associated with the alkalinity or total dissolved solids methods.

Method EPA 353.2
Calibrations for nitrate + nitrite as N were performed using five calibration standards on November 27, 2012. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in five verification checks. All calibration check results were within the acceptance criteria.

Method SW-846 6010B
Calibrations for calcium, magnesium, potassium, and sodium were performed on December 6, 2012, using three calibration standards. The correlation coefficient values were greater than 0.995. The absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in 9 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range.

Method SW-846 6020A
Calibrations were performed for arsenic, molybdenum, selenium, and uranium on December 6, 7, 11, 12, and 13, 2012, using four calibration standards. The calibration curve correlation coefficient values were greater than 0.995. The absolute values of the calibration curve intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in 23 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range with one exception. A uranium check result was above the acceptance range. All affected results were greater than 5 times the PQL or are qualified with a "U" flag as not detected, so no further qualification is necessary. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 8082
The initial calibrations for PCBs were performed using five calibration standards on November 13, 2012. Calibration curves were established using the calibration factor approach. The relative standard deviations for the calibration factors were less than 20 percent. Initial and continuing calibration verification checks were made at the required frequency resulting in three verification checks. All checks met the acceptance criteria with one exception. An Aroclor-1016 peak (column 1) was slightly above the range; however, the average concentration of the five quantified peaks met the acceptance criteria and no reported results were associated with this check. PCBs were not detected in any field sample.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Methods without sample preparation do not require the analysis of a method blank. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and calibration blank results were below the PQL for all analytes with the following exception. A calibration blank result for potassium was above the PQL. The

samples associated with this blank had potassium concentrations greater than 10 times the blank. In cases where a blank concentration exceeds the MDL, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the MDL but less than 5 times the blank concentration.

Inductively Coupled Plasma Interference Check Sample Analysis

Interference check samples were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike. The spike recoveries met the acceptance criteria for all analytes evaluated.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference (RPD) for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. The replicate results met these criteria, demonstrating acceptable laboratory precision.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. All evaluated serial dilution data were acceptable with one exception. The serial dilution for potassium did not meet the acceptance criteria with a positive bias of 39 percent. The associated results are qualified with a "J" flag as estimated values.

PCB Surrogate Recoveries

Laboratory performance for individual samples is established by monitoring the recovery of surrogate spikes. The PCB surrogate recoveries were within the acceptance ranges for all samples.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all chromatography data. All peak integrations were satisfactory.

Anion/Cation Balance

The anion/cation balance is used to determine if major ion concentrations have been quantified correctly. The total anions should balance with (be equal to) the total cations when expressed in milliequivalents per liter. Table 5 shows the total anion and cation results in groundwater samples from this event and the charge balance, which is a RPD calculation. Typically, a charge balance difference of 10 percent is considered acceptable.

Table 5. Comparison of Major Anions and Cations in Groundwater Samples

Location	Cations (meq/L)	Anions (meq/L)	Charge Balance (%)
11(SG)	25.1	25.9	1.6
13(SG)	17.5	17.6	0.3
14(SG)	21.8	22.6	1.8
15(SG)	18.9	20.1	3.1
16(SG)	43.7	46.6	3.2
18(SG)	17.8	19.4	4.3
20(M)	14.3	15.2	3.1
21(M)	19.6	18.3	3.2
22(M)	13.3	14.8	5.4
E(M)	16.2	16.8	1.8
F(M)	6.0	5.9	1.5
I(SG)	11.8	12.8	3.8
L(SG)	28.9	29.6	1.2
OBS-3	33.0	34.3	2.0
S(SG)	44.7	45.7	1.2
Simpson	19.9	21.0	2.8
X(M)	20.1	21.1	2.3
Y2(M)	6.6	6.7	0.8

meq/L = milliequivalents per liter

The charge balance values met the acceptance criteria, indicating acceptable analytical performance.

Electronic Data Deliverable (EDD) File

The EDD file arrived on December, 17, 2012. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements.

The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package. An incorrect filtration status for location OBS-3 was provided to the laboratory on the Chain of Custody. The filtration status was corrected in the SEEPro database.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 12114945 Lab Code: GEN Validator: Gretchen Baer Validation Date: 1/8/2013

Project: Bluewater Analysis Type: ☑ Metals ☑ General Chem ☐ Rad ☑ Organics

# of Samples: 19 Matrix: Water Requested Analysis Completed: Yes

Chain of Custody

Present: OK Signed: OK Dated: OK

Sample

Integrity: OK Preservation: OK Temperature: OK

Select Quality Parameters

☑ Holding Times	All analyses were completed within the applicable holding times.
☑ Detection Limits	There are 0 detection limit failures.
☐ Field/Trip Blanks	
☑ Field Duplicates	There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM
Organics Data Validation Summary

RIN: 12114945 **Project:** Bluewater **Lab Code:** GEN **Validation Date:** 1/8/2013

LCS Recovery: All LCS recoveries were within the laboratory acceptance limits.

Method Blank(s): All method blanks results were below the method detection limit.

MS/MSD Recovery: All MS/MSD recoveries were within the laboratory acceptance limits.

Surrogate Recovery: All surrogate recoveries were within the laboratory acceptance limits.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 12114945 **Lab Code:** GEN **Date Due:** 12/14/2012

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/14/2012

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Calcium	ICP/ES	12/06/2012	0.0000	1.0000	OK	OK	OK	OK	OK	98.1			5.0	98.0	6.0	104.0
Magnesium	ICP/ES	12/06/2012	0.0000	1.0000	OK	OK	OK	OK	OK	100.0			5.0	96.0	9.0	116.0
Potassium	ICP/ES	12/06/2012	0.0000	1.0000	OK	OK	OK	OK	OK	99.8	109.0		6.0	111.0	39.0	113.0
Sodium	ICP/ES	12/06/2012	0.0000	1.0000	OK	OK	OK	OK	OK	94.5			4.0	105.0	6.0	76.0
Arsenic	ICP/MS	12/07/2012												106.0		113.0
Arsenic	ICP/MS	12/06/2012	0.0000	1.0000										110.0		121.0
Arsenic	ICP/MS	12/11/2012	0.0000	1.0000										109.0		112.0
Arsenic	ICP/MS	12/11/2012	0.0000	1.0000										100.0		113.0
Arsenic	ICP/MS	12/07/2012	0.0000	1.0000	OK	OK	OK	OK	OK	105.0	108.0					
Molybdenum	ICP/MS	12/06/2012	0.0000	1.0000										97.0		127.0
Molybdenum	ICP/MS	12/07/2012	0.0000	1.0000	OK	OK	OK	OK	OK	100.0	105.0		7.0			
Molybdenum	ICP/MS	12/07/2012												100.0		117.0
Selenium	ICP/MS	12/07/2012	0.0000	1.0000	OK	OK	OK	OK	OK	110.0	120.0					
Selenium	ICP/MS	12/07/2012												97.0		120.0
Selenium	ICP/MS	12/11/2012	0.0000	1.0000										87.0		115.0
Selenium	ICP/MS	12/11/2012	0.0000	1.0000										101.0		116.0
Selenium	ICP/MS	12/06/2012	0.0000	1.0000										106.0		124.0

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 12114945 **Lab Code:** GEN **Date Due:** 12/14/2012

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/14/2012

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Uranium	ICP/MS	12/06/2012	0.0000	1.0000										111.0		120.0
Uranium	ICP/MS	12/07/2012			OK	OK	OK	OK	OK	103.0	103.0					
Uranium	ICP/MS	12/12/2012	0.0000	1.0000										115.0		132.5
Uranium	ICP/MS	12/13/2012	0.0000	1.0000										118.0		123.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 12114945 **Lab Code:** GEN **Date Due:** 12/14/2012

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/14/2012

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
ALKALINITY, Total as CaCO3	11/27/2012							OK	102				
ALKALINITY, Total as CaCO3	11/28/2012							OK	103	97.9			
ALKALINITY, Total as CaCO3	11/28/2012							OK	110				
Bicarbonate alkalinity (CaCO3	11/27/2012											0	
Bicarbonate alkalinity (CaCO3	11/28/2012											0	
Carbonate alkalinity (CaCO3)	11/27/2012												
Carbonate alkalinity (CaCO3)	11/28/2012						-						
Chloride	11/07/2012	0.190	0.9985	OK		OK							
Chloride	12/03/2012				OK		OK	OK	93.2	95.5		0	
Chloride	12/04/2012									107		0	
NO2+NO3 as N	11/27/2012	-0.003	1.0000	OK	OK	OK	OK	OK	101	101		3	
NO2+NO3 as N	11/27/2012									109			
Sulfate	11/07/2012	0.270	0.9993	OK		OK							
Sulfate	12/03/2012				OK		OK	OK	97.4				
Sulfate	12/04/2012									99.1		1	

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 12114945 **Lab Code:** GEN **Date Due:** 12/14/2012

Matrix: Water **Site Code:** BLU01 **Date Completed:** 12/14/2012

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
Sulfate	12/04/2012											0	
Sulfate	12/05/2012									108			
Total Dissolved Solids	11/19/2012							OK	95.7			1	
Total Dissolved Solids	11/19/2012							OK	97.1			2	
Total Dissolved Solids	11/19/2012											1	

Sampling Quality Control Assessment

The following information summarizes and assesses quality control for this sampling event.

Sampling Protocol

Sample results for monitoring wells were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method and Category I criteria, with the following exceptions:

- As per Program Directive BLU-2013-01, wells S(SG) and OBS-3 were *not* sampled using low-flow criteria. These wells were sampled using dedicated high-volume and high-flow submersible pumps with no field parameter stability requirements.
- Well E(M) was classified as Category II. The sample results were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.
- The location SIMPSON is a domestic well.

Equipment Blank Assessment

No equipment blanks were taken. All samples were collected using dedicated equipment that did not require equipment blanks.

Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. Duplicate samples were collected from location Y2(M). The RPD for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. The duplicate results met the criteria with the exception of the chloride RPD, which was above the criteria at 28 percent. There were no analytical errors identified during the review of the data. The chloride results for this location are qualified with a "J" flag as estimated values.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 12114945 Lab Code: GEN Project: Bluewater Validation Date: 1/8/2013

Duplicate: 2074 Sample: Y2(M)

Analyte	Sample Result	Flag	Error	Dilution	Duplicate Result	Flag	Error	Dilution	RPD	RER	Units
Aroclor 1016	0.034	U		1.00	0.0347	U		1.00			ug/L
Aroclor 1221	0.034	U		1.00	0.0347	U		1.00			ug/L
Aroclor 1232	0.034	U		1.00	0.0347	U		1.00			ug/L
Aroclor 1242	0.034	U		1.00	0.0347	U		1.00			ug/L
Aroclor 1248	0.034	U		1.00	0.0347	U		1.00			ug/L
Aroclor 1254	0.034	U		1.00	0.0347	U		1.00			ug/L
Aroclor 1260	0.034	U		1.00	0.0347	U		1.00			ug/L
Arsenic	1.70	U		1.00	1.70	U		1.00			ug/L
Bicarbonate alkalinity (CaCO3)	206			1.00	201			1.00	2.46		mg/L
Calcium	58200			1.00	57900			1.00	0.52		ug/L
Carbonate alkalinity (CaCO3)	0.725	U		1.00	0.725	U		1.00			mg/L
Chloride	15.2			1.00	11.5			1.00	27.72		mg/L
Magnesium	16600			1.00	16600			1.00	0		ug/L
Molybdenum	1.71			1.00	1.78			1.00	4.01		ug/L
NO2+NO3 as N	1.52			10.00	1.51			5.00	0.66		mg/L
Potassium	3210	E		1.00	3240	E		1.00	0.93		ug/L
Selenium	1.50	U		1.00	1.52	B		1.00			ug/L
Sodium	52300			1.00	53600			1.00	2.46		ug/L
Sulfate	99.9			10.00	97.0			10.00	2.95		mg/L
Total Dissolved Solids	390			1.00	350			1.00	10.81		mg/L
Uranium	5.46			1.00	5.57			1.00	1.99		ug/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donivan — Date: 2-5-2013

Data Validation Lead: Gretchen Baer — Date: 2/5/13

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the environmental database. The application compares the new data set (in standard environmental database units) with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

The total dissolved solids result for Y2(M) was identified as a potential outlier because there is low variability in the few historical data points at this location. There were no errors identified with the total dissolved solids data. Potential anomalies in the field parameters were also examined for patterns of repeated high or low bias, which suggest a systematic error due to instrument malfunction. No such patterns were found and all the results from this sampling event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters
Comparison: All Historical Data
Laboratory: GEL Laboratories
RIN: 12114945
Report Date: 1/14/2013

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
BLU01	E(M)	N001	11/14/2012	Calcium	195		FQ	262		FQ	233		FQ	5	0	No
BLU01	E(M)	N001	11/14/2012	Magnesium	50.2		FQ	63.1		FQ	56		FQ	5	0	No
BLU01	E(M)	N001	11/14/2012	Potassium	3.99	E	JFQ	5.56	E	FQ	4.8		FQ	5	0	No
BLU01	E(M)	N001	11/14/2012	Sodium	50.9		FQ	63.6		FQ	51		FQ	5	0	No
BLU01	E(M)	N001	11/14/2012	Sulfate	750		FQ	960		FQ	780		FQ	5	0	No
BLU01	F(M)	N001	11/14/2012	Calcium	70.2		F	78		F	71.8		F	7	0	No
BLU01	I(SG)	N001	11/14/2012	Molybdenum	0.000532		F	0.0013		UF	0.000663		F	5	1	No
BLU01	L(SG)	N001	11/14/2012	Magnesium	77.8		F	77			1.39		F	5	0	No
BLU01	L(SG)	N001	11/14/2012	Sodium	345		F	333		FQ	240		F	5	0	No
BLU01	L(SG)	N001	11/14/2012	Sulfate	613		F	600			1.7		F	5	0	No
BLU01	L(SG)	N001	11/14/2012	Total Dissolved Solids	1770		F	1700		FQ	769		F	5	0	No
BLU01	OBS-3	0001	11/13/2012	Potassium	12.4	E	J	22			13.8		FQ	6	0	No
BLU01	S(SG)	N001	11/13/2012	Calcium	287			897		F	334		FQ	5	0	No
BLU01	S(SG)	N001	11/13/2012	Chloride	493			2570		F	520		FQ	5	0	No
BLU01	S(SG)	N001	11/13/2012	Molybdenum	0.00126			0.001		FQ	0.000167	U	F	5	2	No
BLU01	S(SG)	N001	11/13/2012	Total Dissolved Solids	3010			5250		F	3040		FQ	5	0	No
BLU01	Y2(M)	N002	11/14/2012	Calcium	57.9		F	77		F	59.3		F	7	0	No
BLU01	Y2(M)	N001	11/14/2012	Calcium	58.2		F	77		F	59.3		F	7	0	No
BLU01	Y2(M)	N002	11/14/2012	Nitrate + Nitrite as Nitrogen	1.51		F	1.42		F	0.494		F	9	0	No
BLU01	Y2(M)	N001	11/14/2012	Nitrate + Nitrite as Nitrogen	1.52		F	1.42		F	0.494		F	9	0	No

Data Validation Outliers Report - No Field Parameters
Comparison: All Historical Data
Laboratory: GEL Laboratories
RIN: 12114945
Report Date: 1/14/2013

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
BLU01	Y2(M)	N002	11/14/2012	Total Dissolved Solids	350		F	420		F	400		F	7	0	Yes
BLU01	Y2(M)	N001	11/14/2012	Total Dissolved Solids	390		F	420		F	400		F	7	0	No
BLU01	Y2(M)	N002	11/14/2012	Uranium	0.00557		F	0.0053		F	0.0046		F	8	0	No
BLU01	Y2(M)	N001	11/14/2012	Uranium	0.00546		F	0.0053		F	0.0046		F	8	0	No

Data Validation Outliers Report - Field Parameters Only
Comparison: All Historical Data
Laboratory: Field Measurements
RIN: 12114945
Report Date: 1/14/2013

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
BLU01	E(M)	N001	11/14/2012	Turbidity	5.96		FQ	46		FQ	7.53		FQ	11	0	No
BLU01	I(SG)	N001	11/14/2012	Specific Conductance	1454		F	1435		F	894		F	6	0	No
BLU01	L(SG)	N001	11/14/2012	Specific Conductance	2913		F	2585		FQ	1317		F	10	0	No
BLU01	L(SG)	N001	11/14/2012	Temperature	12.77		F	20.33		FQ	13.58		F	10	0	No
BLU01	OBS-3	N001	11/13/2012	Temperature	12.24			19.54		FQ	12.51		FQ	11	0	No

STATISTICAL TESTS:
The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test
Outliers are identified using Dixon's Test when there are 25 or fewer data points.
Outliers are identified using Rosner's Test when there are 26 or more data points.
See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 11(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	265 - 295	544		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	265 - 295	0.725	U	F	#	0.725	
Arsenic	mg/L	11/14/2012	N001	265 - 295	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	265 - 295	182		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	265 - 295	193		F	#	0.67	
Dissolved Oxygen	mg/L	11/14/2012	N001	265 - 295	0.51		F	#		
Magnesium	mg/L	11/14/2012	N001	265 - 295	66.9		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	265 - 295	0.000454	B	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	265 - 295	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	11/14/2012	N001	265 - 295	-134		F	#		
pH	s.u.	11/14/2012	N001	265 - 295	6.93		F	#		
Potassium	mg/L	11/14/2012	N001	265 - 295	11.4	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	265 - 295	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	265 - 295	235		F	#	0.1	
Specific Conductance	umhos /cm	11/14/2012	N001	265 - 295	2590		F	#		
Sulfate	mg/L	11/14/2012	N001	265 - 295	461		F	#	6.65	
Temperature	C	11/14/2012	N001	265 - 295	12.17		F	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	265 - 295	1530		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	265 - 295	5.72		F	#		
Uranium	mg/L	11/14/2012	N001	265 - 295	0.0239		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 13(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	270 - 300	301		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	270 - 300	0.725	U	F	#	0.725	
Arsenic	mg/L	11/15/2012	N001	270 - 300	0.00311	B	F	#	0.0017	
Calcium	mg/L	11/15/2012	N001	270 - 300	168		F	#	0.05	
Chloride	mg/L	11/15/2012	N001	270 - 300	86.5		F	#	0.67	
Dissolved Oxygen	mg/L	11/15/2012	N001	270 - 300	2.24		F	#		
Magnesium	mg/L	11/15/2012	N001	270 - 300	51		F	#	0.11	
Molybdenum	mg/L	11/15/2012	N001	270 - 300	0.00135		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/15/2012	N001	270 - 300	4.4		F	#	0.425	
Oxidation Reduction Potential	mV	11/15/2012	N001	270 - 300	114.4		F	#		
pH	s.u.	11/15/2012	N001	270 - 300	6.86		F	#		
Potassium	mg/L	11/15/2012	N001	270 - 300	6.2	E	JF	#	0.05	
Selenium	mg/L	11/15/2012	N001	270 - 300	0.00639		F	#	0.0015	
Sodium	mg/L	11/15/2012	N001	270 - 300	109		F	#	0.1	
Specific Conductance	umhos /cm	11/15/2012	N001	270 - 300	1419		F	#		
Sulfate	mg/L	11/15/2012	N001	270 - 300	424		F	#	2.66	
Temperature	C	11/15/2012	N001	270 - 300	12.57		F	#		
Total Dissolved Solids	mg/L	11/15/2012	N001	270 - 300	1070		F	#	3.4	
Turbidity	NTU	11/15/2012	N001	270 - 300	1.03		F	#		
Uranium	mg/L	11/15/2012	N001	270 - 300	0.116		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 14(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	285 - 315	541		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	285 - 315	0.725	U	F	#	0.725	
Arsenic	mg/L	11/14/2012	N001	285 - 315	0.0734		F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	285 - 315	118		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	285 - 315	162		F	#	0.67	
Dissolved Oxygen	mg/L	11/14/2012	N001	285 - 315	0.78		F	#		
Magnesium	mg/L	11/14/2012	N001	285 - 315	45		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	285 - 315	0.003		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	285 - 315	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	11/14/2012	N001	285 - 315	-130.7		F	#		
pH	s.u.	11/14/2012	N001	285 - 315	7.08		F	#		
Potassium	mg/L	11/14/2012	N001	285 - 315	5.08	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	285 - 315	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	285 - 315	277		F	#	0.1	
Specific Conductance	umhos /cm	11/14/2012	N001	285 - 315	2267		F	#		
Sulfate	mg/L	11/14/2012	N001	285 - 315	346		F	#	1.33	
Temperature	C	11/14/2012	N001	285 - 315	12.78		F	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	285 - 315	1290		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	285 - 315	3.56		F	#		
Uranium	mg/L	11/14/2012	N001	285 - 315	0.0437		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 15(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	341	-	371	421		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	341	-	371	0.725	U	F	#	0.725	
Arsenic	mg/L	11/13/2012	N001	341	-	371	0.0226		F	#	0.0017	
Calcium	mg/L	11/13/2012	N001	341	-	371	83.7		F	#	0.05	
Chloride	mg/L	11/13/2012	N001	341	-	371	164		F	#	0.67	
Dissolved Oxygen	mg/L	11/13/2012	N001	341	-	371	0.62		F	#		
Magnesium	mg/L	11/13/2012	N001	341	-	371	29		F	#	0.11	
Molybdenum	mg/L	11/13/2012	N001	341	-	371	0.0071		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/13/2012	N001	341	-	371	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	11/13/2012	N001	341	-	371	-123		F	#		
pH	s.u.	11/13/2012	N001	341	-	371	7.26		F	#		
Potassium	mg/L	11/13/2012	N001	341	-	371	5.46	E	JF	#	0.05	
Selenium	mg/L	11/13/2012	N001	341	-	371	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/13/2012	N001	341	-	371	280		F	#	0.1	
Specific Conductance	umhos /cm	11/13/2012	N001	341	-	371	2085		F	#		
Sulfate	mg/L	11/13/2012	N001	341	-	371	339		F	#	1.33	
Temperature	C	11/13/2012	N001	341	-	371	13.9		F	#		
Total Dissolved Solids	mg/L	11/13/2012	N001	341	-	371	1170		F	#	3.4	
Turbidity	NTU	11/13/2012	N001	341	-	371	1.88		F	#		
Uranium	mg/L	11/13/2012	N001	341	-	371	0.0743		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 16(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	195 - 225	424		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	195 - 225	0.725	U	F	#	0.725	
Arsenic	mg/L	11/13/2012	N001	195 - 225	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/13/2012	N001	195 - 225	301		F	#	0.05	
Chloride	mg/L	11/13/2012	N001	195 - 225	455		F	#	6.7	
Dissolved Oxygen	mg/L	11/13/2012	N001	195 - 225	0.84		F	#		
Magnesium	mg/L	11/13/2012	N001	195 - 225	150		F	#	0.11	
Molybdenum	mg/L	11/13/2012	N001	195 - 225	0.00281		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/13/2012	N001	195 - 225	4.32		F	#	0.17	
Oxidation Reduction Potential	mV	11/13/2012	N001	195 - 225	41.4		F	#		
pH	s.u.	11/13/2012	N001	195 - 225	6.58		F	#		
Potassium	mg/L	11/13/2012	N001	195 - 225	12.5	E	JF	#	0.05	
Selenium	mg/L	11/13/2012	N001	195 - 225	0.0196		F	#	0.0015	
Sodium	mg/L	11/13/2012	N001	195 - 225	369		F	#	0.1	
Specific Conductance	umhos /cm	11/13/2012	N001	195 - 225	4553		F	#		
Sulfate	mg/L	11/13/2012	N001	195 - 225	1200		F	#	13.3	
Temperature	C	11/13/2012	N001	195 - 225	13.34		F	#		
Total Dissolved Solids	mg/L	11/13/2012	N001	195 - 225	3050		F	#	3.4	
Turbidity	NTU	11/13/2012	N001	195 - 225	5.74		F	#		
Uranium	mg/L	11/13/2012	N001	195 - 225	1.43		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 18(SG) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	260 - 290	332		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	260 - 290	0.725	U	F	#	0.725	
Arsenic	mg/L	11/14/2012	N001	260 - 290	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	260 - 290	161		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	260 - 290	100		F	#	0.67	
Dissolved Oxygen	mg/L	11/14/2012	N001	260 - 290	0.99		F	#		
Magnesium	mg/L	11/14/2012	N001	260 - 290	51.1		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	260 - 290	0.00254		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	260 - 290	3.31		F	#	0.085	
Oxidation Reduction Potential	mV	11/14/2012	N001	260 - 290	25.9		F	#		
pH	s.u.	11/14/2012	N001	260 - 290	6.82		F	#		
Potassium	mg/L	11/14/2012	N001	260 - 290	6.95	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	260 - 290	0.0051		F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	260 - 290	123		F	#	0.1	
Specific Conductance	umhos /cm	11/14/2012	N001	260 - 290	1904		F	#		
Sulfate	mg/L	11/14/2012	N001	260 - 290	465		F	#	2.66	
Temperature	C	11/14/2012	N001	260 - 290	13.7		F	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	260 - 290	1190		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	260 - 290	1.55		F	#		
Uranium	mg/L	11/14/2012	N001	260 - 290	0.207		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 20(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	110 - 125	258		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	110 - 125	0.725	U	F	#	0.725	
Arsenic	mg/L	11/14/2012	N001	110 - 125	0.00941		F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	110 - 125	148		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	110 - 125	56.4		F	#	0.67	
Dissolved Oxygen	mg/L	11/14/2012	N001	110 - 125	6.12		F	#		
Magnesium	mg/L	11/14/2012	N001	110 - 125	38.1		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	110 - 125	0.00186		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	110 - 125	3.18		F	#	0.085	
Oxidation Reduction Potential	mV	11/14/2012	N001	110 - 125	29.4		F	#		
pH	s.u.	11/14/2012	N001	110 - 125	7.1		F	#		
Potassium	mg/L	11/14/2012	N001	110 - 125	4.5	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	110 - 125	0.00467	B	F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	110 - 125	83.7		F	#	0.1	
Specific Conductance	umhos /cm	11/14/2012	N001	110 - 125	1511		F	#		
Sulfate	mg/L	11/14/2012	N001	110 - 125	394		F	#	2.66	
Temperature	C	11/14/2012	N001	110 - 125	13.26		F	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	110 - 125	954		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	110 - 125	1.82		F	#		
Uranium	mg/L	11/14/2012	N001	110 - 125	0.0197		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 21(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	139.6 - 149.6	164		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	139.6 - 149.6	0.725	U	F	#	0.725	
Arsenic	mg/L	11/15/2012	N001	139.6 - 149.6	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/15/2012	N001	139.6 - 149.6	151		F	#	0.05	
Chloride	mg/L	11/15/2012	N001	139.6 - 149.6	150		F	#	0.67	
Dissolved Oxygen	mg/L	11/15/2012	N001	139.6 - 149.6	4.22		F	#		
Magnesium	mg/L	11/15/2012	N001	139.6 - 149.6	40.8		F	#	0.11	
Molybdenum	mg/L	11/15/2012	N001	139.6 - 149.6	0.000937		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/15/2012	N001	139.6 - 149.6	8.68		F	#	0.425	
Oxidation Reduction Potential	mV	11/15/2012	N001	139.6 - 149.6	109.6		F	#		
pH	s.u.	11/15/2012	N001	139.6 - 149.6	7.14		F	#		
Potassium	mg/L	11/15/2012	N001	139.6 - 149.6	5.53	E	JF	#	0.05	
Selenium	mg/L	11/15/2012	N001	139.6 - 149.6	0.0106		F	#	0.0015	
Sodium	mg/L	11/15/2012	N001	139.6 - 149.6	196		F	#	0.1	
Specific Conductance	umhos /cm	11/15/2012	N001	139.6 - 149.6	1726		F	#		
Sulfate	mg/L	11/15/2012	N001	139.6 - 149.6	490		F	#	6.65	
Temperature	C	11/15/2012	N001	139.6 - 149.6	13.16		F	#		
Total Dissolved Solids	mg/L	11/15/2012	N001	139.6 - 149.6	1330		F	#	3.4	
Turbidity	NTU	11/15/2012	N001	139.6 - 149.6	3.3		F	#		
Uranium	mg/L	11/15/2012	N001	139.6 - 149.6	0.132		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: 22(M) WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	136.83 - 146.83	327		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	136.83 - 146.83	0.725	U	F	#	0.725	
Arsenic	mg/L	11/15/2012	N001	136.83 - 146.83	0.00251	B	F	#	0.0017	
Calcium	mg/L	11/15/2012	N001	136.83 - 146.83	86.2		F	#	0.05	
Chloride	mg/L	11/15/2012	N001	136.83 - 146.83	33.4		F	#	0.67	
Dissolved Oxygen	mg/L	11/15/2012	N001	136.83 - 146.83	1.12		F	#		
Magnesium	mg/L	11/15/2012	N001	136.83 - 146.83	24.4		F	#	0.11	
Molybdenum	mg/L	11/15/2012	N001	136.83 - 146.83	0.000783		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/15/2012	N001	136.83 - 146.83	32.3		F	#	1.7	
Oxidation Reduction Potential	mV	11/15/2012	N001	136.83 - 146.83	104.3		F	#		
pH	s.u.	11/15/2012	N001	136.83 - 146.83	7.18		F	#		
Potassium	mg/L	11/15/2012	N001	136.83 - 146.83	4.69	E	JF	#	0.05	
Selenium	mg/L	11/15/2012	N001	136.83 - 146.83	0.00558		F	#	0.0015	
Sodium	mg/L	11/15/2012	N001	136.83 - 146.83	157		F	#	0.1	
Specific Conductance	umhos /cm	11/15/2012	N001	136.83 - 146.83	1251		F	#		
Sulfate	mg/L	11/15/2012	N001	136.83 - 146.83	239		F	#	1.33	
Temperature	C	11/15/2012	N001	136.83 - 146.83	13.16		F	#		
Total Dissolved Solids	mg/L	11/15/2012	N001	136.83 - 146.83	939		F	#	3.4	
Turbidity	NTU	11/15/2012	N001	136.83 - 146.83	2.15		F	#		
Uranium	mg/L	11/15/2012	N001	136.83 - 146.83	0.315		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: E(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	68.6	-	89.8	11.8		FQ	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	68.6	-	89.8	0.725	U	FQ	#	0.725	
Aroclor - 1016	ug/L	11/14/2012	N001	68.6	-	89.8	0.0354	U	FQ	#	0.0354	
Aroclor - 1221	ug/L	11/14/2012	N001	68.6	-	89.8	0.0354	U	FQ	#	0.0354	
Aroclor - 1232	ug/L	11/14/2012	N001	68.6	-	89.8	0.0354	U	FQ	#	0.0354	
Aroclor - 1242	ug/L	11/14/2012	N001	68.6	-	89.8	0.0354	U	FQ	#	0.0354	
Aroclor - 1248	ug/L	11/14/2012	N001	68.6	-	89.8	0.0354	U	FQ	#	0.0354	
Aroclor - 1254	ug/L	11/14/2012	N001	68.6	-	89.8	0.0354	U	FQ	#	0.0354	
Aroclor - 1260	ug/L	11/14/2012	N001	68.6	-	89.8	0.0354	U	FQ	#	0.0354	
Arsenic	mg/L	11/14/2012	N001	68.6	-	89.8	0.0017	U	FQ	#	0.0017	
Calcium	mg/L	11/14/2012	N001	68.6	-	89.8	195		FQ	#	0.05	
Chloride	mg/L	11/14/2012	N001	68.6	-	89.8	32.7		FQ	#	0.67	
Dissolved Oxygen	mg/L	11/14/2012	N001	68.6	-	89.8	3.92		FQ	#		
Magnesium	mg/L	11/14/2012	N001	68.6	-	89.8	50.2		FQ	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	68.6	-	89.8	0.000404	B	FQ	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	68.6	-	89.8	0.017	U	FQ	#	0.017	
Oxidation Reduction Potential	mV	11/14/2012	N001	68.6	-	89.8	-85.9		FQ	#		
pH	s.u.	11/14/2012	N001	68.6	-	89.8	7.21		FQ	#		
Potassium	mg/L	11/14/2012	N001	68.6	-	89.8	3.99	E	JFQ	#	0.05	
Selenium	mg/L	11/14/2012	N001	68.6	-	89.8	0.0015	U	FQ	#	0.0015	
Sodium	mg/L	11/14/2012	N001	68.6	-	89.8	50.9		FQ	#	0.1	
Specific Conductance	umhos	11/14/2012	N001	68.6	-	89.8	1701		FQ	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: E(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
	/cm											
Sulfate	mg/L	11/14/2012	N001	68.6	-	89.8	750		FQ	#	13.3	
Temperature	C	11/14/2012	N001	68.6	-	89.8	13.98		FQ	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	68.6	-	89.8	1210		FQ	#	3.4	
Turbidity	NTU	11/14/2012	N001	68.6	-	89.8	5.96		FQ	#		
Uranium	mg/L	11/14/2012	N001	68.6	-	89.8	0.000067	U	FQ	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: F(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	94.2 - 114.87	170		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	94.2 - 114.87	0.725	U	F	#	0.725	
Aroclor - 1016	ug/L	11/14/2012	N001	94.2 - 114.87	0.037	U	F	#	0.037	
Aroclor - 1221	ug/L	11/14/2012	N001	94.2 - 114.87	0.037	U	F	#	0.037	
Aroclor - 1232	ug/L	11/14/2012	N001	94.2 - 114.87	0.037	U	F	#	0.037	
Aroclor - 1242	ug/L	11/14/2012	N001	94.2 - 114.87	0.037	U	F	#	0.037	
Aroclor - 1248	ug/L	11/14/2012	N001	94.2 - 114.87	0.037	U	F	#	0.037	
Aroclor - 1254	ug/L	11/14/2012	N001	94.2 - 114.87	0.037	U	F	#	0.037	
Aroclor - 1260	ug/L	11/14/2012	N001	94.2 - 114.87	0.037	U	F	#	0.037	
Arsenic	mg/L	11/14/2012	N001	94.2 - 114.87	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	94.2 - 114.87	70.2		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	94.2 - 114.87	11		F	#	0.067	
Dissolved Oxygen	mg/L	11/14/2012	N001	94.2 - 114.87	2.67		F	#		
Magnesium	mg/L	11/14/2012	N001	94.2 - 114.87	19		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	94.2 - 114.87	0.00103		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	94.2 - 114.87	0.695		F	#	0.085	
Oxidation Reduction Potential	mV	11/14/2012	N001	94.2 - 114.87	37.4		F	#		
pH	s.u.	11/14/2012	N001	94.2 - 114.87	7.58		F	#		
Potassium	mg/L	11/14/2012	N001	94.2 - 114.87	3.45	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	94.2 - 114.87	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	94.2 - 114.87	20.2		F	#	0.1	
Specific Conductance	umhos	11/14/2012	N001	94.2 - 114.87	625		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: F(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
	/cm											
Sulfate	mg/L	11/14/2012	N001	94.2	-	114.87	101		F	#	1.33	
Temperature	C	11/14/2012	N001	94.2	-	114.87	14.72		F	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	94.2	-	114.87	354		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	94.2	-	114.87	1.52		F	#		
Uranium	mg/L	11/14/2012	N001	94.2	-	114.87	0.0086		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: I(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	-	140		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	-	0.725	U	F	#	0.725	
Arsenic	mg/L	11/14/2012	N001	-	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	-	24.4		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	-	195		F	#	0.67	
Dissolved Oxygen	mg/L	11/14/2012	N001	-	0.27		F	#		
Magnesium	mg/L	11/14/2012	N001	-	24.4		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	-	0.000532		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	-	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	11/14/2012	N001	-	-227.4		F	#		
pH	s.u.	11/14/2012	N001	-	8.14		F	#		
Potassium	mg/L	11/14/2012	N001	-	6.98	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	-	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	-	194		F	#	0.1	
Specific Conductance	umhos /cm	11/14/2012	N001	-	1454		F	#		
Sulfate	mg/L	11/14/2012	N001	-	215		F	#	1.33	
Temperature	C	11/14/2012	N001	-	15.09		F	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	-	740		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	-	7.25		F	#		
Uranium	mg/L	11/14/2012	N001	-	0.00276		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: L(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	-	563		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	-	0.725	U	F	#	0.725	
Arsenic	mg/L	11/14/2012	N001	-	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	-	145		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	-	197		F	#	1.34	
Dissolved Oxygen	mg/L	11/14/2012	N001	-	0.97		F	#		
Magnesium	mg/L	11/14/2012	N001	-	77.8		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	-	0.000464	B	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	-	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	11/14/2012	N001	-	-77.6		F	#		
pH	s.u.	11/14/2012	N001	-	6.7		F	#		
Potassium	mg/L	11/14/2012	N001	-	8.14	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	-	0.0015	U	F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	-	345		F	#	0.1	
Specific Conductance	umhos /cm	11/14/2012	N001	-	2913		F	#		
Sulfate	mg/L	11/14/2012	N001	-	613		F	#	2.66	
Temperature	C	11/14/2012	N001	-	12.77		F	#		
Total Dissolved Solids	mg/L	11/14/2012	N001	-	1770		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	-	3.08		F	#		
Uranium	mg/L	11/14/2012	N001	-	0.00316		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: OBS-3 WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/13/2012	0001	152.4 - 350	16			#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/13/2012	0001	152.4 - 350	0.725	U		#	0.725	
Arsenic	mg/L	11/13/2012	0001	152.4 - 350	0.0017	U		#	0.0017	
Calcium	mg/L	11/13/2012	0001	152.4 - 350	106			#	0.05	
Chloride	mg/L	11/13/2012	0001	152.4 - 350	616			#	6.7	
Dissolved Oxygen	mg/L	11/13/2012	N001	152.4 - 350	2.62			#		
Magnesium	mg/L	11/13/2012	0001	152.4 - 350	132			#	0.11	
Molybdenum	mg/L	11/13/2012	0001	152.4 - 350	0.000191	B		#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/13/2012	0001	152.4 - 350	0.0404	J		#	0.017	
Oxidation Reduction Potential	mV	11/13/2012	N001	152.4 - 350	-77.6			#		
pH	s.u.	11/13/2012	N001	152.4 - 350	6.81			#		
Potassium	mg/L	11/13/2012	0001	152.4 - 350	12.4	E	J	#	0.05	
Selenium	mg/L	11/13/2012	0001	152.4 - 350	0.0015	U		#	0.0015	
Sodium	mg/L	11/13/2012	0001	152.4 - 350	379			#	0.1	
Specific Conductance	umhos /cm	11/13/2012	N001	152.4 - 350	3928			#		
Sulfate	mg/L	11/13/2012	0001	152.4 - 350	797			#	13.3	
Temperature	C	11/13/2012	N001	152.4 - 350	12.24			#		
Total Dissolved Solids	mg/L	11/13/2012	0001	152.4 - 350	2330			#	3.4	
Turbidity	NTU	11/13/2012	N001	152.4 - 350	72.5			#		
Uranium	mg/L	11/13/2012	0001	152.4 - 350	0.0106			#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: S(SG) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	159	-	280	374			#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	159	-	280	0.725	U		#	0.725	
Arsenic	mg/L	11/13/2012	N001	159	-	280	0.0017	U		#	0.0017	
Calcium	mg/L	11/13/2012	N001	159	-	280	287			#	0.05	
Chloride	mg/L	11/13/2012	N001	159	-	280	493			#	6.7	
Dissolved Oxygen	mg/L	11/13/2012	N001	159	-	280	3.57			#		
Magnesium	mg/L	11/13/2012	N001	159	-	280	161			#	0.11	
Molybdenum	mg/L	11/13/2012	N001	159	-	280	0.00126			#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/13/2012	N001	159	-	280	2.64			#	0.17	
Oxidation Reduction Potential	mV	11/13/2012	N001	159	-	280	-95.5			#		
pH	s.u.	11/13/2012	N001	159	-	280	7.01			#		
Potassium	mg/L	11/13/2012	N001	159	-	280	13.3	E	J	#	0.05	
Selenium	mg/L	11/13/2012	N001	159	-	280	0.012			#	0.0015	
Sodium	mg/L	11/13/2012	N001	159	-	280	385			#	0.1	
Specific Conductance	umhos /cm	11/13/2012	N001	159	-	280	4576			#		
Sulfate	mg/L	11/13/2012	N001	159	-	280	1160			#	13.3	
Temperature	C	11/13/2012	N001	159	-	280	14.32			#		
Total Dissolved Solids	mg/L	11/13/2012	N001	159	-	280	3010			#	3.4	
Turbidity	NTU	11/13/2012	N001	159	-	280	9.15			#		
Uranium	mg/L	11/13/2012	N001	159	-	280	0.367			#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: SIMPSON WELL GPS of coordinates during sampling conducted 5/15/2012 by SM Stoller

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	-	205			#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/13/2012	N001	-	0.725	U		#	0.725	
Arsenic	mg/L	11/13/2012	N001	-	0.0017	U		#	0.0017	
Calcium	mg/L	11/13/2012	N001	-	224			#	0.05	
Chloride	mg/L	11/13/2012	N001	-	122			#	0.67	
Magnesium	mg/L	11/13/2012	N001	-	46.8			#	0.11	
Molybdenum	mg/L	11/13/2012	N001	-	0.000645			#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/13/2012	N001	-	8.69			#	0.17	
Oxidation Reduction Potential	mV	11/13/2012	N001	-	37.4			#		
pH	s.u.	11/13/2012	N001	-	7.22			#		
Potassium	mg/L	11/13/2012	N001	-	3.22	E	J	#	0.05	
Selenium	mg/L	11/13/2012	N001	-	0.0564			#	0.0015	
Sodium	mg/L	11/13/2012	N001	-	109			#	0.1	
Specific Conductance	umhos /cm	11/13/2012	N001	-	2097			#		
Sulfate	mg/L	11/13/2012	N001	-	617			#	2.66	
Temperature	C	11/13/2012	N001	-	8.23			#		
Total Dissolved Solids	mg/L	11/13/2012	N001	-	1310			#	3.4	
Turbidity	NTU	11/13/2012	N001	-	9.57			#		
Uranium	mg/L	11/13/2012	N001	-	0.00454			#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: X(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	123	-	132	230		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/15/2012	N001	123	-	132	0.725	U	F	#	0.725	
Aroclor - 1016	ug/L	11/15/2012	N001	123	-	132	0.0347	U	F	#	0.0347	
Aroclor - 1221	ug/L	11/15/2012	N001	123	-	132	0.0347	U	F	#	0.0347	
Aroclor - 1232	ug/L	11/15/2012	N001	123	-	132	0.0347	U	F	#	0.0347	
Aroclor - 1242	ug/L	11/15/2012	N001	123	-	132	0.0347	U	F	#	0.0347	
Aroclor - 1248	ug/L	11/15/2012	N001	123	-	132	0.0347	U	F	#	0.0347	
Aroclor - 1254	ug/L	11/15/2012	N001	123	-	132	0.0347	U	F	#	0.0347	
Aroclor - 1260	ug/L	11/15/2012	N001	123	-	132	0.0347	U	F	#	0.0347	
Arsenic	mg/L	11/15/2012	N001	123	-	132	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/15/2012	N001	123	-	132	163		F	#	0.05	
Chloride	mg/L	11/15/2012	N001	123	-	132	192		F	#	0.67	
Dissolved Oxygen	mg/L	11/15/2012	N001	123	-	132	4.22		F	#		
Magnesium	mg/L	11/15/2012	N001	123	-	132	45.9		F	#	0.11	
Molybdenum	mg/L	11/15/2012	N001	123	-	132	0.000702		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/15/2012	N001	123	-	132	9.8		F	#	0.85	
Oxidation Reduction Potential	mV	11/15/2012	N001	123	-	132	142.8		F	#		
pH	s.u.	11/15/2012	N001	123	-	132	7.43		F	#		
Potassium	mg/L	11/15/2012	N001	123	-	132	5.49	E	JF	#	0.05	
Selenium	mg/L	11/15/2012	N001	123	-	132	0.00732		F	#	0.0015	
Sodium	mg/L	11/15/2012	N001	123	-	132	186		F	#	0.1	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: X(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Specific Conductance	umhos /cm	11/15/2012	N001	123	-	132	1795		F	#		
Sulfate	mg/L	11/15/2012	N001	123	-	132	499		F	#	6.65	
Temperature	C	11/15/2012	N001	123	-	132	12.08		F	#		
Total Dissolved Solids	mg/L	11/15/2012	N001	123	-	132	1350		F	#	3.4	
Turbidity	NTU	11/15/2012	N001	123	-	132	5.25		F	#		
Uranium	mg/L	11/15/2012	N001	123	-	132	0.134		F	#	0.000067	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: Y2(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	98 - 123	206		F	#	0.725	
Alkalinity, Bicarbonate (as $CaCO_3$)	mg/L	11/14/2012	N002	98 - 123	201		F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N001	98 - 123	0.725	U	F	#	0.725	
Alkalinity, Carbonate (as $CaCO_3$)	mg/L	11/14/2012	N002	98 - 123	0.725	U	F	#	0.725	
Aroclor - 1016	ug/L	11/14/2012	N001	98 - 123	0.034	U	F	#	0.034	
Aroclor - 1016	ug/L	11/14/2012	N002	98 - 123	0.0347	U	F	#	0.0347	
Aroclor - 1221	ug/L	11/14/2012	N001	98 - 123	0.034	U	F	#	0.034	
Aroclor - 1221	ug/L	11/14/2012	N002	98 - 123	0.0347	U	F	#	0.0347	
Aroclor - 1232	ug/L	11/14/2012	N001	98 - 123	0.034	U	F	#	0.034	
Aroclor - 1232	ug/L	11/14/2012	N002	98 - 123	0.0347	U	F	#	0.0347	
Aroclor - 1242	ug/L	11/14/2012	N001	98 - 123	0.034	U	F	#	0.034	
Aroclor - 1242	ug/L	11/14/2012	N002	98 - 123	0.0347	U	F	#	0.0347	
Aroclor - 1248	ug/L	11/14/2012	N001	98 - 123	0.034	U	F	#	0.034	
Aroclor - 1248	ug/L	11/14/2012	N002	98 - 123	0.0347	U	F	#	0.0347	
Aroclor - 1254	ug/L	11/14/2012	N001	98 - 123	0.034	U	F	#	0.034	
Aroclor - 1254	ug/L	11/14/2012	N002	98 - 123	0.0347	U	F	#	0.0347	
Aroclor - 1260	ug/L	11/14/2012	N001	98 - 123	0.034	U	F	#	0.034	
Aroclor - 1260	ug/L	11/14/2012	N002	98 - 123	0.0347	U	F	#	0.0347	
Arsenic	mg/L	11/14/2012	N001	98 - 123	0.0017	U	F	#	0.0017	
Arsenic	mg/L	11/14/2012	N002	98 - 123	0.0017	U	F	#	0.0017	
Calcium	mg/L	11/14/2012	N001	98 - 123	58.2		F	#	0.05	

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: Y2(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	11/14/2012	N002	98 - 123	57.9		F	#	0.05	
Chloride	mg/L	11/14/2012	N001	98 - 123	15.2		JF	#	0.067	
Chloride	mg/L	11/14/2012	N002	98 - 123	11.5		JF	#	0.067	
Dissolved Oxygen	mg/L	11/14/2012	N001	98 - 123	5		F	#		
Magnesium	mg/L	11/14/2012	N001	98 - 123	16.6		F	#	0.11	
Magnesium	mg/L	11/14/2012	N002	98 - 123	16.6		F	#	0.11	
Molybdenum	mg/L	11/14/2012	N001	98 - 123	0.00171		F	#	0.000165	
Molybdenum	mg/L	11/14/2012	N002	98 - 123	0.00178		F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N001	98 - 123	1.52		F	#	0.17	
Nitrate + Nitrite as Nitrogen	mg/L	11/14/2012	N002	98 - 123	1.51		F	#	0.085	
Oxidation Reduction Potential	mV	11/14/2012	N001	98 - 123	33.3		F	#		
pH	s.u.	11/14/2012	N001	98 - 123	7.45		F	#		
Potassium	mg/L	11/14/2012	N001	98 - 123	3.21	E	JF	#	0.05	
Potassium	mg/L	11/14/2012	N002	98 - 123	3.24	E	JF	#	0.05	
Selenium	mg/L	11/14/2012	N001	98 - 123	0.0015	U	F	#	0.0015	
Selenium	mg/L	11/14/2012	N002	98 - 123	0.00152	B	F	#	0.0015	
Sodium	mg/L	11/14/2012	N001	98 - 123	52.3		F	#	0.1	
Sodium	mg/L	11/14/2012	N002	98 - 123	53.6		F	#	0.1	
Specific Conductance	umhos /cm	11/14/2012	N001	98 - 123	718		F	#		
Sulfate	mg/L	11/14/2012	N001	98 - 123	99.9		F	#	1.33	
Sulfate	mg/L	11/14/2012	N002	98 - 123	97		F	#	1.33	
Temperature	C	11/14/2012	N001	98 - 123	13.14		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/14/2013
Location: Y2(M) WELL State Plane coordinates established with GPS Mapping Grade, Local coordinates source AutoCAD drawing

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Total Dissolved Solids	mg/L	11/14/2012	N001	98 - 123	390		F	#	3.4	
Total Dissolved Solids	mg/L	11/14/2012	N002	98 - 123	350		F	#	3.4	
Turbidity	NTU	11/14/2012	N001	98 - 123	2.18		F	#		
Uranium	mg/L	11/14/2012	N001	98 - 123	0.00546		F	#	0.000067	
Uranium	mg/L	11/14/2012	N002	98 - 123	0.00557		F	#	0.000067	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.
LAB QUALIFIERS:
- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X,Y,Z Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:
- F Low flow sampling method used.
- G Possible grout contamination, pH > 9.
- J Estimated value.
- L Less than 3 bore volumes purged prior to sampling.
- Q Qualitative result due to sampling technique.
- R Unusable result.
- U Parameter analyzed for but was not detected.
- X Location is undefined.

QA QUALIFIER:
- # Validated according to quality assurance guidelines.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE BLU01, Bluewater Disposal Site
REPORT DATE: 1/25/2013

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
11(SG)			11/14/2012	08:55:07	205.07		
13(SG)			11/15/2012	09:20:49	166.57		
14(SG)			11/14/2012	11:15:11	188.22		
15(SG)			11/13/2012	10:50:56	184.79		
16(SG)			11/13/2012	16:45:00	184.28		
18(SG)			11/14/2012	12:50:09	173.49		
20(M)			11/14/2012	10:35:56	104.94		
21(M)		6587.8	11/15/2012	10:05:43	128.14	6459.66	
22(M)		6600.33	11/15/2012	10:40:06	136.91	6463.42	
23(M)			11/13/2012	15:08:00			D
E(M)		6613.08	11/14/2012	11:40:51	81.48	6531.6	
F(M)		6600.31	11/14/2012	14:15:28	113.42	6486.89	
I(SG)		6616.17	11/14/2012	15:30:11	199.22	6416.95	
L(SG)		6602.6	11/14/2012	09:55:30	160.15	6442.45	
OBS-3		6612.6	11/13/2012	15:45:58	183.09	6429.51	
S(SG)		6621.14	11/13/2012	15:15:28	191.11	6430.03	
T(M)		6609.4	11/13/2012	12:00:00			D
X(M)			11/15/2012	08:25:50	131.74		
Y2(M)		6605.4	11/14/2012	13:25:52	117.34	6488.06	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
N UNKNOWN O ON SITE U UPGRADIENT

WATER LEVEL FLAGS: D Dry F Flowing B Below top of pump

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Time-Concentration Graphs

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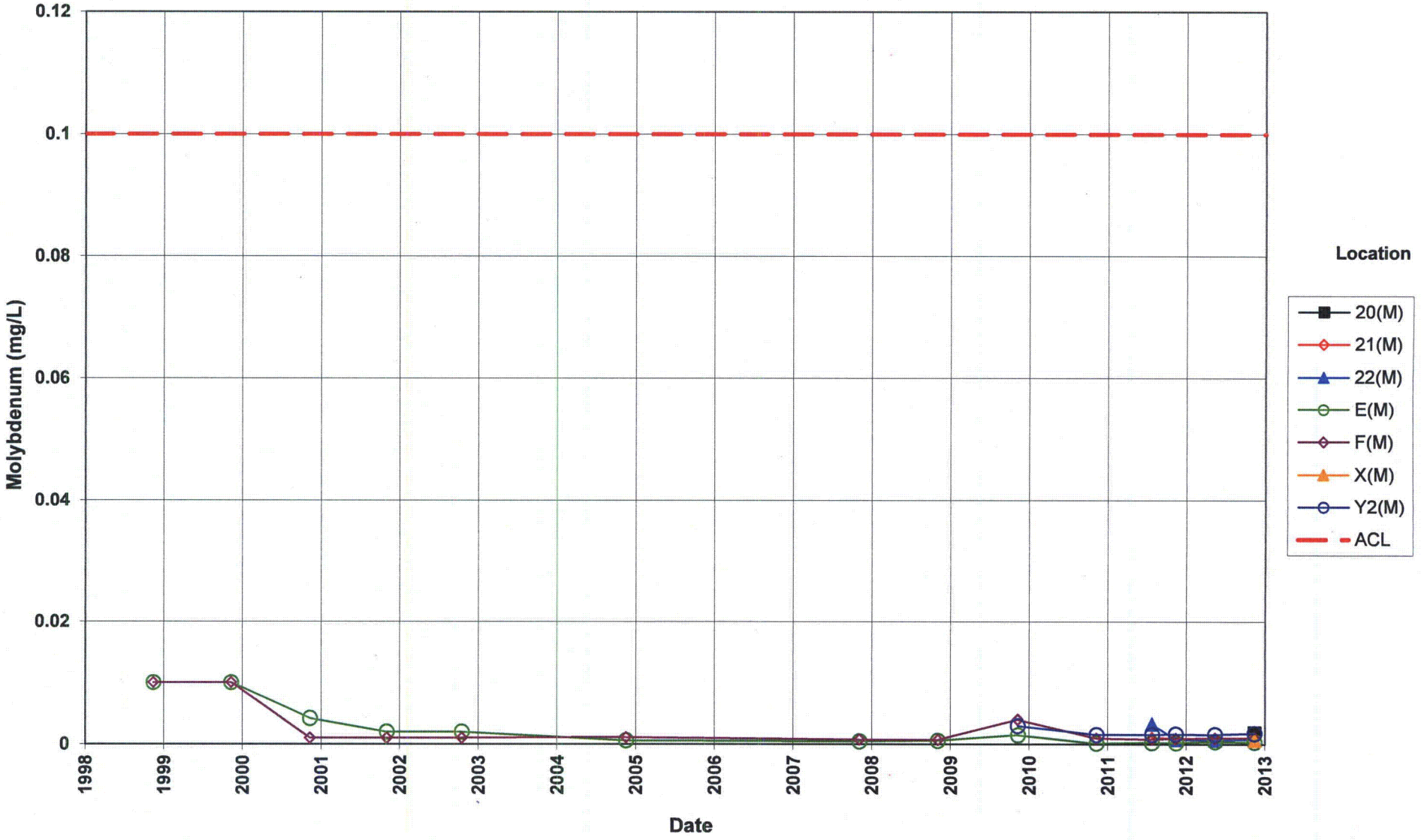
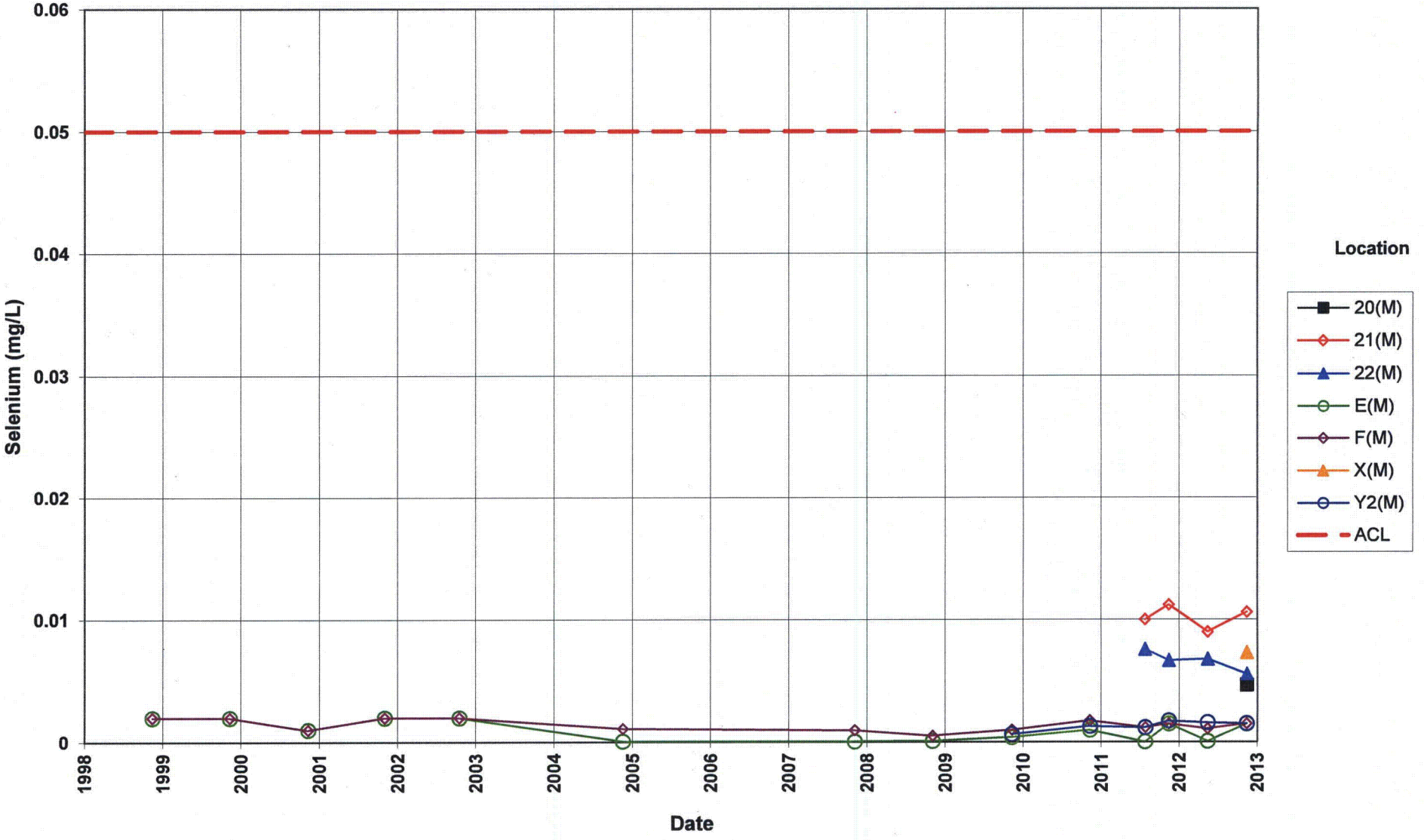
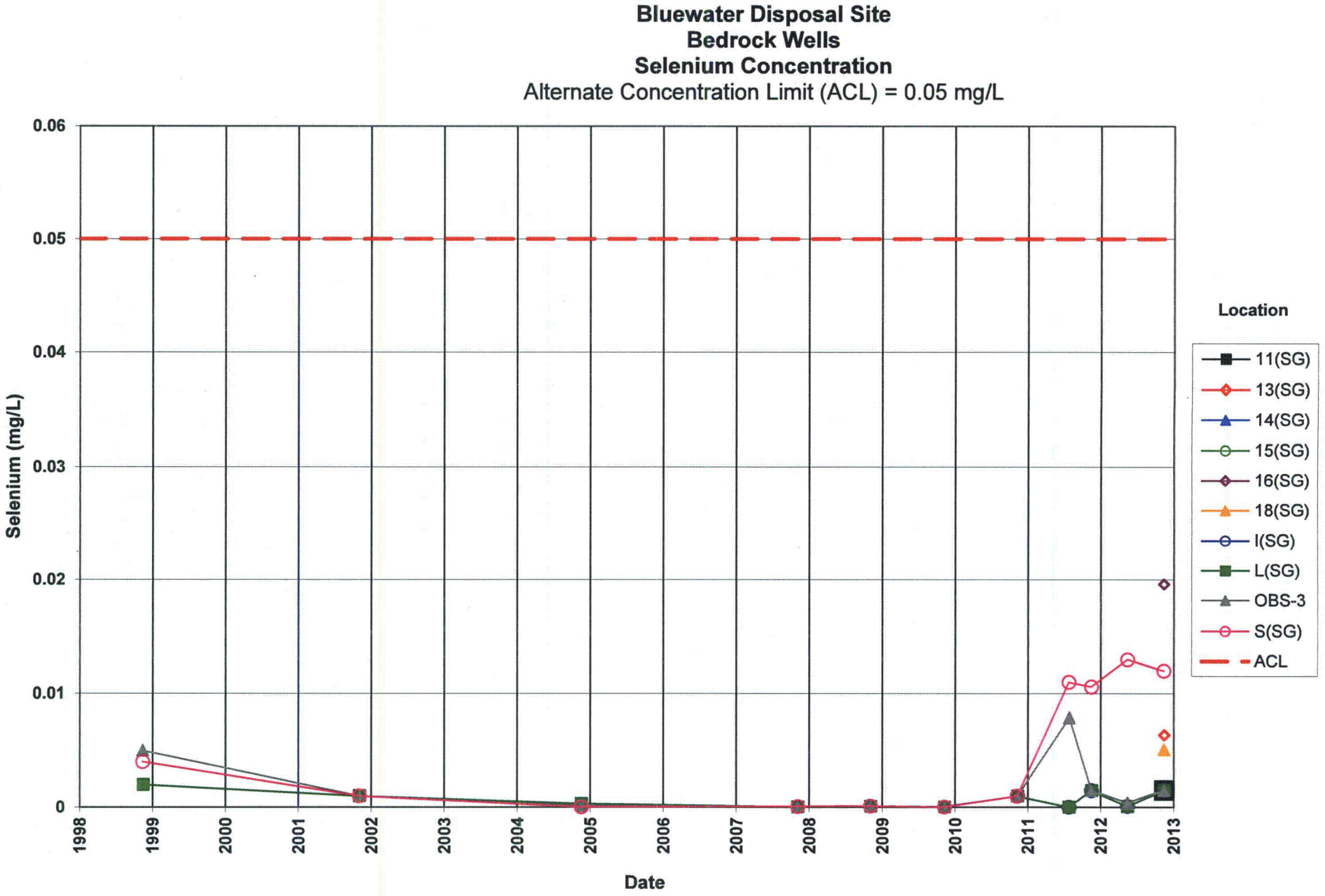
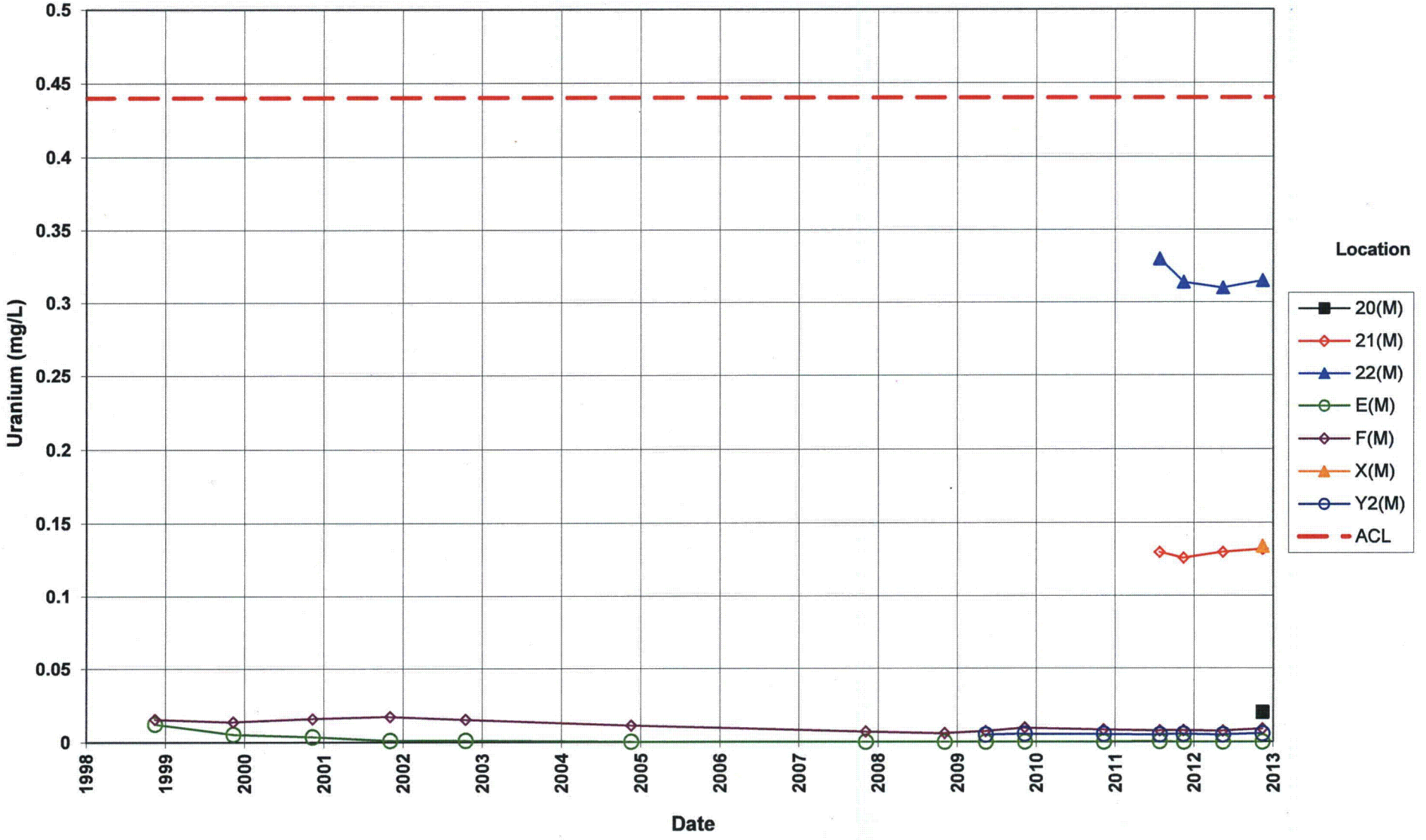

Bluewater Disposal Site
Alluvium Wells
Molybdenum Concentration
Alternate Concentration Limit (ACL) = 0.1 mg/L
Molybdenum (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Date
Location
20(M)
21(M)
22(M)
E(M)
F(M)
X(M)
Y2(M)
ACL

Bluewater Disposal Site
Alluvium Wells
Selenium Concentration
Alternate Concentration Limit (ACL) = 0.05 mg/L

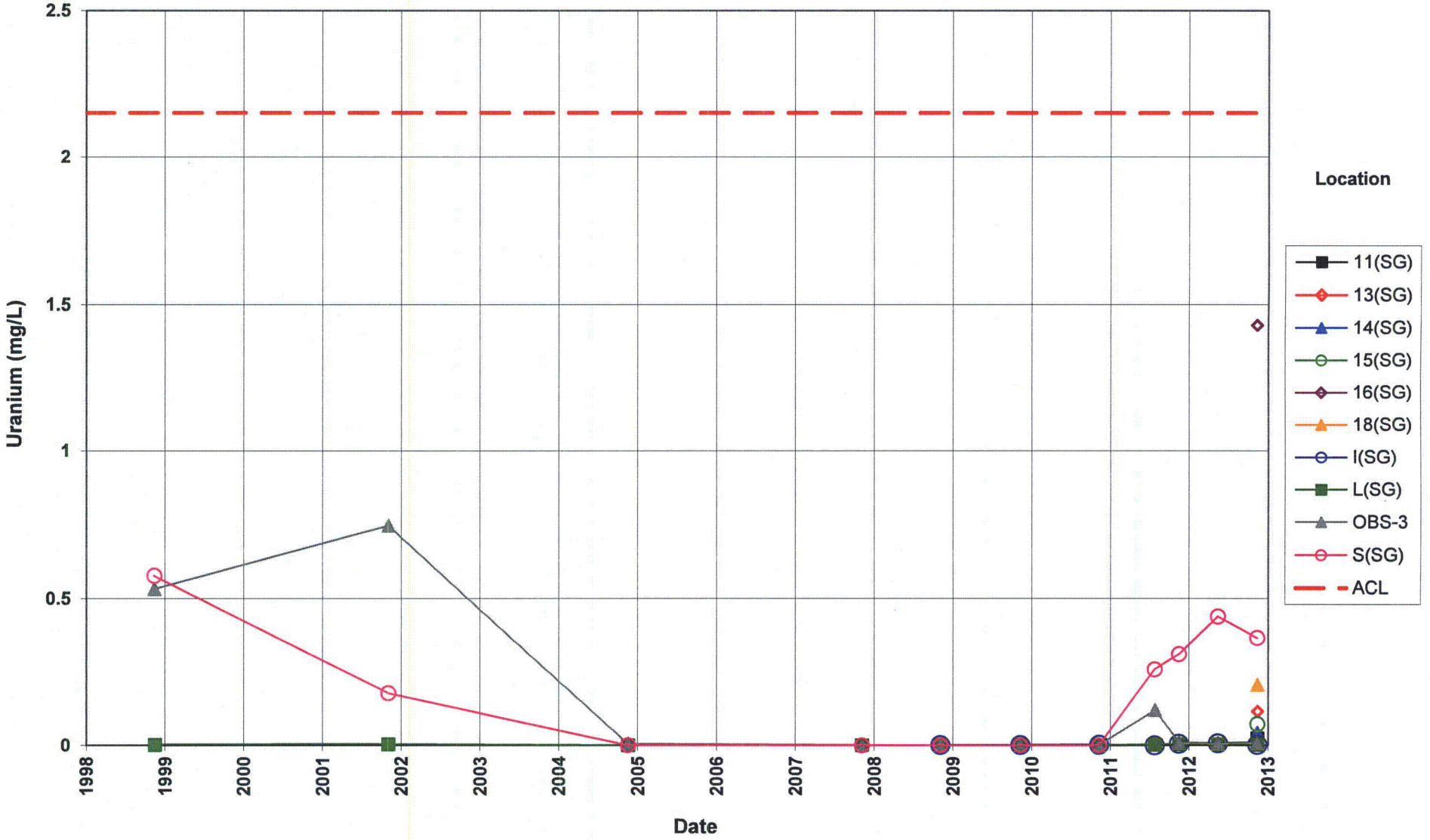



Bluewater Disposal Site
Bedrock Wells
Selenium Concentration
Alternate Concentration Limit (ACL) = 0.05 mg/L
Selenium (mg/L)
0.06
0.05
0.04
0.03
0.02
0.01
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Date
Location
11(SG)
13(SG)
14(SG)
15(SG)
16(SG)
18(SG)
I(SG)
L(SG)
OBS-3
S(SG)
ACL

Bluewater Disposal Site
Alluvium Wells
Uranium Concentration
Alternate Concentration Limit (ACL) = 0.44 mg/L



Bluewater Disposal Site
Bedrock Wells
Uranium Concentration
Alternate Concentration Limit (ACL) = 2.15 mg/L



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Attachment 3
Sampling and Analysis Work Order

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Task Order LM00-501
Control Number 13-0031

October 16, 2012

U.S. Department of Energy
Office of Legacy Management
ATTN: Deborah Barr
Site Manager
2597 Legacy Way
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller) November 2012 Environmental Sampling at the Bluewater, New Mexico, Disposal Site

REFERENCE: Task Order LM00-501-03-203-402, Bluewater, New Mexico, Disposal Site

Dear Ms. Barr:

The purpose of this letter is to inform you of the upcoming sampling event at Bluewater, New Mexico. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Bluewater disposal site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of November 12, 2012.

The following list shows the monitoring wells (with zone of completion) scheduled for sampling during this event.

Monitoring Wells*

E(M) Al	T(M) Al	S(SG) Sg	11(SG) Sg	15(SG) Sg	20(M) Al	22(M) Al
Y2(M) Al	X(M) Al	OBS-3 Sg	13(SG) Sg	16(SG) Sg	21(M) Al	23(M) Al
F(M) Al	L(SG) Sg	I(SG) Sg	14(SG) Sg	18(SG) Sg		

*NOTE: Al = alluvium; Sg = San Andres-Glorieta

Private Wells
HMC-951 Simpson

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

Please contact me at (970) 248-6022 if you have any questions.

Sincerely,

Richard K. Johnson
Site Lead

RKJ/lcg/lb

Enclosures (3)

cc: (electronic)
Karl Stoeckle, DOE
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Dick Johnson, Stoller
EDD Delivery
rc-grand.junction
File: BLU 410.02(A)

The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

Constituent Sampling Breakdown

Site	Bluewater				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	10	0			
Field Measurements					
Alkalinity					
Dissolved Oxygen	X				
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Arsenic	X		0.0001	SW-846 6020	LMM-02
Bicarbonate	X		10	SM2320 B	WCH-A-003
Calcium	X		5	SW-846 6010	LMM-01
Carbonate	X		10	SM2320 B	WCH-A-004
Chloride	X		0.5	SW-846 9056	WCH-A-039
Iron					
Lead					
Magnesium	X		5	SW-846 6010	LMM-01
Manganese					
Molybdenum	X		0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N	X		0.05	EPA 353.1	WCH-A-022
PCBs	E(M), Y2(M), F(M), T(M), and X(M) only		0.0005	SW-846 8082	PEP-A-006
Potassium	X		1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium	X		0.0001	SW-846 6020	LMM-02
Silica					
Sodium	X		1	SW-846 6010	LMM-01
Strontium					
Sulfate	X		0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	X		10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium	X		0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	15	0			

Note: All analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

Sampling Frequencies for Locations at Bluewater, New Mexico

Location ID	Quarterly	Semiannually	Annually	Triennially	Not Sampled	Notes
Monitoring Wells						
E(M)		X				PCBs in November only
Y2(M)		X				PCBs in November only
F(M)		X				PCBs in November only
T(M)		X				PCBs in November only
X(M)		X				
L(SG)		X				
S(SG)		X				
OBS-3		X				
I(SG)		X				
11(SG)		X				
13(SG)		X				
14(SG)		X				
15(SG)		X				
16(SG)		X				
18(SG)		X				
20(M)		X				
21(M)		X				
22(M)		X				
23(M)		X				May be dry
Private Wells						
Simpson		X				
HMC-951		X				

Sampling conducted in May and November.

Attachment 4
Trip Report

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Stoller
Grand Junction Office

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Memorandum

DATE: January 14, 2013

TO: Dick Johnson

FROM: David Atkinson

SUBJECT: Trip Report

Site: Bluewater and Ambrosia Lake Disposal Sites.

Dates of Sampling Event: 11/12/2012 – 11/16/2012.

Team Members: David Atkinson, Jeff Walters.

Number of Locations Sampled: 2 monitoring well samples and 1 duplicate sample were collected at Ambrosia Lake; 18 monitoring well samples and 1 duplicate sample were collected at Bluewater.

Locations Not Sampled/Reason: Bluewater locations 23(M), and T(M) were dry, domestic location HMC-951 was not sampled because there was no current access agreement. Ambrosia Lake location 0409 was dry.

Location Specific Information:
Bluewater: Location X(M), which was previously dry, had been redeveloped and produced water at a flow rate of +200 ml/min. Locations OBS-3 and S(SG) were sampled using previously installed submersible pumps according to Bluewater program directive BLU-2013-01. Location OBS-3 was purged at approximately 6 gpm and went dry after approximately 84 gallons. Location S(SG) was sampled after a purge of approximately 990 gallons. (Approximately 5.5 gpm for 3 hours, minimum purge volume was approximately 810 gallons). Location 16(SG) was sampled the same day as the bladder pump was installed (at least 6 hours between installation and sample collection).

Ambrosia Lake: None.

Quality Control Sample Cross Reference: The following are the false identifications assigned to the quality control samples.

SITE	FALSE ID	TRUE ID	SAMPLE TYPE	ASSOCIATED MATRIX	TICKET NUMBER
BLU	2074	Y2(M)	Duplicate	Groundwater	KMU 298
AMB	2073	0675	Duplicate	Groundwater	KMU 316

RIN Number Assigned: All Bluewater samples were assigned to RIN 12114945. All Ambrosia Lake samples were assigned to RIN 12114946.

Sample Shipment: Samples were shipped overnight via FedEx to GEL Laboratories in Charleston, SC from Grants, NM, on November 15, 2012.

Water Level Measurements: Water levels at all monitoring wells were measured prior to sampling.

Well Inspection Summary: N/A

Field Variance: None.

Equipment: All equipment functioned properly.

Site Issues: None

Corrective Action Required/Taken: None

cc: (electronic)
Deborah Barr, DOE
April Gil, DOE
Steve Donivan, Stoller
Dick Johnson, Stoller
EDD Delivery