

Data Validation Package

November 2013
Groundwater and Surface Water
Sampling at the Burrell, Pennsylvania,
Disposal Site

January 2014

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Sampling Event Summary

Site: Burrell, Pennsylvania, Disposal Site

Sampling Period: November 19–20, 2013

The 2000 *Long-Term Surveillance Plan for the U.S. Department of Energy Burrell Vicinity Property, Blairsville, Pennsylvania*, requires groundwater monitoring as a best management practice to evaluate the performance of the disposal cell. Groundwater is monitored at 5-year intervals and began in 1999. The planned sample locations are listed in Table 1.

Table 1. Groundwater Monitoring Locations, Burrell, Pennsylvania, Disposal Site

Monitoring Wells	Location
0420 & 0520	Upgradient, or background wells
0422 & 0522	Cross gradient, point-of-compliance wells
0423 & 0523	Downgradient, point-of-compliance wells
0424 & 0524	Downgradient, point-of-compliance wells
Seeps	Location
0611	Bottom of disposal cell
0612	Bottom of disposal cell

Sampling and analysis was conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites (LMS/PRO/S04351, continually updated)*. Samples were collected from all planned locations with the exception of seep 0612 because it was dry. A duplicate sample was collected from location 0522. An equipment blank was not collected because dedicated sampling equipment was used.

Four of the analytes that are monitored (lead, molybdenum, selenium, and uranium) have maximum concentration limits (MCLs) from 40 CFR 192.02 that are used as indicators for evaluating cell performance. The concentrations of these analytes did not exceed their respective MCLs in any of the samples.

The data are consistent with the historical results and indicate that seepage from the disposal cell has not occurred and groundwater quality relative to background has not degraded, thus demonstrating continuing performance of the disposal cell.



Michele L. Miller
2014.02.05 17:07:46 -05'00'

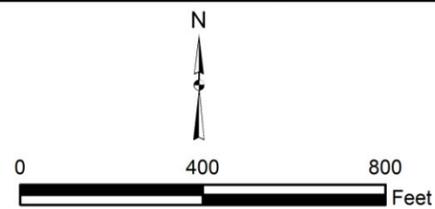
Michele Miller
Site Lead, S.M. Stoller

Date

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- LEGEND**
- WELL TO BE SAMPLED
 - SURFACE LOCATION TO BE SAMPLED
 - - - SITE BOUNDARY



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AM01-07LM00060
Planned Sampling Map Burrell, PA, Disposal Site October 2013	
DATE PREPARED: September 11, 2013	FILENAME: S1068900

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Burrell, Pennsylvania, Disposal Site, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	<u>Burrell, Pennsylvania</u>	Date(s) of Water Sampling	<u>November 19–20, 2013</u>
Date(s) of Verification	<u>January 20, 2014</u>	Name of Verifier	<u>Stephen Donovan</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List any Program Directives or other documents, SOPs, instructions.	<u>Yes</u>	<u>Work Order letter dated September 25, 2013.</u>
2. Were the sampling locations specified in the planning documents sampled?	<u>No</u>	<u>Location 0612 was dry and not sampled.</u>
3. Were calibrations conducted as specified in the above-named documents?	<u>NA</u>	<u>Calibration data not available.</u>
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	<u>NA</u> <u>NA</u>	<u>Operational check data not available.</u>
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	<u>No</u>	<u>Alkalinity was not measured. Field parameters for well 0420 were recorded after the sample was filtered.</u>
6. Were wells categorized correctly?	<u>Yes</u>	<u>All wells were Category I.</u>
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling?	<u>Yes</u>	
Did the water level stabilize prior to sampling?	<u>Yes</u>	
Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling?	<u>Yes</u>	
Was the flow rate less than 500 mL/min?	<u>Yes</u>	

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? Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected at location 0522.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	An equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
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. Was all pertinent information documented on the field data sheets?	Yes	
18. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 13095638
Sample Event: November 19–20, 2013
Site(s): Burrell, Pennsylvania
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1311456
Analysis: Metals and Wet Chemistry
Validator: Stephen Donovan
Review Date: January 16, 2014

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/POL/S04325, continually updated) “Standard Practice for Validation of Environmental 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 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Calcium, Iron, Magnesium, Manganese, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010B
Chloride	MIS-A-045	SW-846 9056	SW-846 9056
Lead, Molybdenum, Selenium, Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Sulfate	MIS-A-045	SW-846 9056	SW-846 9056
Total Dissolved Solids	WCH-A-033	EPA 16.01	EPA 160.1

Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to the attached validation worksheets and the sections below for an explanation of the data qualifiers applied.

Table 3. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
1311456-1	0420	ORP	R	Sample filtered prior to measurement
1311456-1	0420	pH	R	Sample filtered prior to measurement
1311456-1	0420	Specific Conductance	R	Sample filtered prior to measurement
1311456-1	0420	Temperature	R	Sample filtered prior to measurement
1311456-1	0420	Turbidity	R	Sample filtered prior to measurement
1311456-6	0522	Iron	U	Less than 5 times the method blank
1311456-6	0522	Magnesium	U	Less than 5 times the method blank
1311456-7	0523	Iron	U	Less than 5 times the method blank
1311456-7	0523	Magnesium	U	Less than 5 times the method blank
1311456-8	0524	Iron	U	Less than 5 times the method blank
1311456-8	0524	Magnesium	U	Less than 5 times the method blank
1311456-10	0522 Duplicate	Iron	U	Less than 5 times the method blank
1311456-10	0522 Duplicate	Magnesium	U	Less than 5 times the method blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received ten water samples on November 22, 2013, accompanied by Chain of Custody (COC) forms. The COC forms were checked to confirm that all of the samples were listed on the forms and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the COC forms had no errors or omissions with the following exceptions. The sample filtration status was not entered on the COC forms. The filtration status was corrected when the data were loaded into the environmental database. The receiving documentation included copies of the shipping labels listing the air waybill numbers.

Preservation and Holding Times

The sample shipments were received intact with the temperatures inside the iced coolers at 3.0 °C and 4.8 °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 required holding time.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all metal and wet chemical 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.

The reported MDLs for all metal and wet chemical analytes demonstrate compliance with contractual requirements.

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 353.2

Calibration was performed for nitrate + nitrite as N on November 25, 2013, using seven calibration standards. 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 with all checks meeting the acceptance criteria.

Method SW-846 6010B

Calibration for calcium, iron, magnesium, manganese, potassium, and sodium was performed on November 25, 2013, using single point calibrations. Initial and continuing calibration verification checks were made at the required frequency with all checks meeting 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 lead, molybdenum, selenium, and uranium on November 25, 2013, using seven calibration standards. 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 with all checks meeting 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. 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 9056

Calibrations were performed for chloride and sulfate on November 11, 2013, using five calibration standards. 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 with all checks meeting the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. 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. All initial and continuing calibration blank results associated with the samples were below the MDL.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

Inductively coupled plasma 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) pairs were analyzed for all analytes as a measure of method performance in the sample matrix. The MS data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spike recoveries met the recovery 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 for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results 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 Samples

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. The control sample results were acceptable for all analytes.

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. The serial dilution data met the acceptance criteria for all data evaluated.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for all analytes.

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 chloride and sulfate data. There were no manual integrations performed and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file arrived on December 2, 2013. The Sample Management System EDD validation module was used to verify that the EDD files were complete and in compliance with requirements. The module compares the contents of the files 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.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 13095638 Lab Code: PAR Validator: Stephen Donovan Validation Date: 01/16/2014
Project: Burrell Analysis Type: Metals General Chem Rad Organics
of Samples: 10 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
- Detection Limits
- Field/Trip Blanks
- Field Duplicates

All analyses were completed within the applicable holding times.

The reported detection limits are equal to or below contract requirements.

There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM
Metals Data Validation Worksheet

RIN: 13095638 Lab Code: PAR Date Due: 12/20/2013
 Matrix: Water Site Code: CAN03 Date Completed: 12/03/2013

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	CCV	CCB								
Calcium	ICP/ES	11/25/2013	0.0000	1.0000	OK	OK	OK	95.0	106.0	103.0	1.0	104.0	3.0	103.0
Calcium	ICP/ES	11/25/2013										103.0		104.0
Iron	ICP/ES	11/25/2013	0.0000	1.0000	OK	OK	OK	89.0			1.0	107.0	2.0	97.0
Iron	ICP/ES	11/25/2013										107.0		104.0
Lead	ICP/MS	11/25/2013	0.0000	1.0000	OK	OK	OK	99.0	102.0	102.0	0.0	102.0		116.0
Magnesium	ICP/ES	11/25/2013	0.0000	1.0000	OK	OK	OK	94.0	97.0	96.0	1.0	104.0	1.0	104.0
Magnesium	ICP/ES	11/25/2013										106.0		107.0
Manganese	ICP/ES	11/25/2013	0.0000	1.0000	OK	OK	OK	96.0	96.0	91.0	1.0	92.0	4.0	105.0
Manganese	ICP/ES	11/25/2013										96.0		113.0
Molybdenum	ICP/MS	11/25/2013	0.0000	1.0000	OK	OK	OK	94.0	100.0	99.0	1.0	91.0		102.0
Potassium	ICP/ES	11/25/2013	0.0000	1.0000	OK	OK	OK	95.0	108.0	107.0	1.0			86.0
Potassium	ICP/ES	11/25/2013												81.0
Selenium	ICP/MS	11/25/2013	0.0000	1.0000	OK	OK	OK	97.0	102.0	95.0	7.0	102.0		122.0
Sodium	ICP/ES	11/25/2013	0.0000	1.0000	OK	OK	OK	97.0	115.0	112.0	2.0		1.0	85.0
Sodium	ICP/ES	11/25/2013												84.0
Uranium	ICP/MS	11/25/2013	0.0000	1.0000	OK	OK	OK	101.0	107.0	109.0	2.0	102.0		120.0

SAMPLE MANAGEMENT SYSTEM
Wet Chemistry Data Validation Worksheet

RIN: 13095638 **Lab Code:** PAR **Date Due:** 12/20/2013
Matrix: Water **Site Code:** CAN03 **Date Completed:** 12/03/2013

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
CHLORIDE	11/24/2013	0.000	0.9999	OK	OK	OK	103.00	87.0	86.0	0	
Nitrate+Nitrite as N	11/25/2013	0.000	0.9999	OK	OK	OK	99.00	103.0	107.0	4.00	
SULFATE	11/24/2013	0.000	0.9999	OK	OK	OK	102.00	109.0	106.0	1.00	
TOTAL DISSOLVED SOLIDS	11/27/2013					OK	104.00			2.00	

Sampling Quality Control Assessment

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

Sampling Protocol

Sample results for all monitoring wells were qualified with an “F” flag in the database, indicating that the wells were purged and sampled using the low-flow sampling method, meeting the Category I criteria.

The field measurements for well 0420 were recorded after the sample was filtered. The field measurements are therefore not valid and are qualified with an “R” flag as rejected.

Equipment Blank Assessment

Dedicated equipment was used to collect all samples and an equipment blank was not required.

Field Duplicate Assessment

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. A duplicate sample was collected from location 0522. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results less than 5 times the PQL, the range should be no greater than the PQL. All duplicate results met these criteria demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

RIN: 13095638 Lab Code: PAR Project: Burrell Validation Date: 01/16/2014

Duplicate: 2820

Sample: 0522

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Calcium	660	B		1	670	B		1	1.50		UG/L
CHLORIDE	7			1	6.8			1	2.90		MG/L
Iron	8.6	B		1	6.3	B		1			UG/L
Lead	0.068	U		10	0.068	U		10			UG/L
Magnesium	200	B		1	190	B		1	5.13		UG/L
Manganese	0.94	B		1	1.1	B		1	NA		UG/L
Molybdenum	0.48	B		10	0.43	B		10			UG/L
Nitrate+Nitrite as N	0.01	U		1	0.01	U		1			MG/L
Potassium	2100			1	1600			1	NA		UG/L
Selenium	0.032	U		1	0.032	U		1			UG/L
Sodium	160000			5	150000			5	6.45		UG/L
SULFATE	4.6			1	4.8			1	4.26		MG/L
TOTAL DISSOLVED SOLIDS	400			1	390			1	2.53		MG/L
Uranium	0.029	U		10	0.029	U		10			UG/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the 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:	 _____ Stephen Donivan	Stephen E. Donivan 2014.02.03 10:02:39 -07'00' _____ Date
Data Validation Lead:	 _____ Stephen Donivan	Stephen E. Donivan 2014.02.03 10:02:56 -07'00' _____ Date

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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 review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

Three of the analytical results were identified as potential outliers. There were no errors noted during the review of these data and the data for this RIN are acceptable as qualified.

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Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 13095638

Report Date: 01/20/2014

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	
CAN03	0420	N001	11/19/2013	Chloride	33		F	27		F	14		RX	24	0	Yes
CAN03	0420	N001	11/19/2013	Lead	0.00014	B	F	0.05		RX	0.00015	B	UF	24	22	No
CAN03	0420	N001	11/19/2013	Manganese	2		F	1.98		RX	0.56		RX	24	0	No
CAN03	0422	N001	11/19/2013	Chloride	20		F	19.4		RX	6.1		F	26	0	NA
CAN03	0422	N001	11/19/2013	Potassium	6.6		F	6.5		F	0.71		RX	26	0	NA
CAN03	0422	N001	11/19/2013	Sulfate	27		F	139		RX	80		F	26	0	NA
CAN03	0422	N001	11/19/2013	Uranium	0.00017		F	0.003	U	RX	0.00024		F	26	12	NA
CAN03	0423	N001	11/20/2013	Molybdenum	0.0089		F	0.08		RX	0.01	U	RX	25	1	No
CAN03	0424	N001	11/20/2013	Iron	4.2		F	0.8		RX	0.01	U	RXJ	22	3	Yes
CAN03	0424	N001	11/20/2013	Magnesium	36		F	65.9		RX	38.2		RX	22	0	NA
CAN03	0424	N001	11/20/2013	Sulfate	95		F	393		RX	110		F	22	0	Yes
CAN03	0424	N001	11/20/2013	Total Dissolved Solids	630		F	1010		RX	660		F	22	0	No
CAN03	0520	N001	11/19/2013	Chloride	16		F	15		F	0.51		U	31	1	No
CAN03	0522	N001	11/19/2013	Manganese	0.00094	B	F	0.01	U	RX	0.001	U	G	23	17	NA
CAN03	0522	N001	11/19/2013	Molybdenum	0.00048	B	F	0.02		RX	0.00053	B	UF	23	17	NA
CAN03	0522	N002	11/19/2013	Molybdenum	0.00043	B	F	0.02		RX	0.00053	B	UF	23	17	NA
CAN03	0523	N001	11/20/2013	Sodium	280		F	264		G	82		RX	26	0	NA

Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 13095638

Report Date: 01/20/2014

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	
CAN03	0524	N001	11/20/2013	Calcium	1.3		F	3.29			1.5		RX	35	0	NA
CAN03	0524	N001	11/20/2013	Chloride	19		F	18		RX	13		F	35	0	No
CAN03	0524	N001	11/20/2013	Manganese	0.0069		F	0.0203			0.01	U	RX	35	9	NA
CAN03	0611	N001	11/19/2013	Molybdenum	0.0073			0.04		RX	0.011			6	0	No
CAN03	0611	N001	11/19/2013	Sulfate	61			200		J	62.9			6	0	No
CAN03	0611	N001	11/19/2013	Uranium	0.00032			0.007		RX	0.0011			6	0	NA

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.

NA: Data are not normally or lognormally distributed.

Attachment 2

Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0420 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Calcium	mg/L	11/19/2013	N001	-35.4	-55.4	120		F	#	0.012	
Chloride	mg/L	11/19/2013	N001	-35.4	-55.4	33		F	#	1	
Iron	mg/L	11/19/2013	N001	-35.4	-55.4	28		F	#	0.0049	
Lead	mg/L	11/19/2013	N001	-35.4	-55.4	0.00014	B	F	#	0.000068	
Magnesium	mg/L	11/19/2013	N001	-35.4	-55.4	28		F	#	0.013	
Manganese	mg/L	11/19/2013	N001	-35.4	-55.4	2		F	#	0.00011	
Molybdenum	mg/L	11/19/2013	N001	-35.4	-55.4	0.0023		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	-35.4	-55.4	0.01		F	#	0.01	
Oxidation Reduction Potential	mV	11/19/2013	0001	-35.4	-55.4	1.5		RF	#		
pH	s.u.	11/19/2013	0001	-35.4	-55.4	6.2		RF	#		
Potassium	mg/L	11/19/2013	N001	-35.4	-55.4	2.1		F	#	0.11	
Selenium	mg/L	11/19/2013	N001	-35.4	-55.4	0.000083	B	F	#	0.000032	
Sodium	mg/L	11/19/2013	N001	-35.4	-55.4	20		F	#	0.0066	
Specific Conductance	umhos/cm	11/19/2013	0001	-35.4	-55.4	980		RF	#		
Sulfate	mg/L	11/19/2013	N001	-35.4	-55.4	250		F	#	2.5	
Temperature	C	11/19/2013	0001	-35.4	-55.4	10.88		RF	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	-35.4	-55.4	620		F	#	20	
Turbidity	NTU	11/19/2013	0001	-35.4	-55.4	4.08		RF	#		
Uranium	mg/L	11/19/2013	N001	-35.4	-55.4	0.0001		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0422 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers			Detection Limit	Uncertainty
								Lab	Data	QA		
Calcium	mg/L	11/19/2013	N001	-37	-	-52	130		F	#	0.012	
Chloride	mg/L	11/19/2013	N001	-37	-	-52	20		F	#	1	
Dissolved Oxygen	mg/L	11/19/2013	N001	-37	-	-52	0.94		F	#		
Iron	mg/L	11/19/2013	N001	-37	-	-52	18		F	#	0.0049	
Lead	mg/L	11/19/2013	N001	-37	-	-52	0.00013	B	F	#	0.000068	
Magnesium	mg/L	11/19/2013	N001	-37	-	-52	27		F	#	0.013	
Manganese	mg/L	11/19/2013	N001	-37	-	-52	1.6		F	#	0.00011	
Molybdenum	mg/L	11/19/2013	N001	-37	-	-52	0.0091		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	-37	-	-52	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	11/19/2013	N001	-37	-	-52	-99.8		F	#		
pH	s.u.	11/19/2013	N001	-37	-	-52	6.92		F	#		
Potassium	mg/L	11/19/2013	N001	-37	-	-52	6.6		F	#	0.11	
Selenium	mg/L	11/19/2013	N001	-37	-	-52	0.000056	B	F	#	0.000032	
Sodium	mg/L	11/19/2013	N001	-37	-	-52	18		F	#	0.0066	
Specific Conductance	umhos /cm	11/19/2013	N001	-37	-	-52	980		F	#		
Sulfate	mg/L	11/19/2013	N001	-37	-	-52	27		F	#	2.5	
Temperature	C	11/19/2013	N001	-37	-	-52	10.44		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	-37	-	-52	520		F	#	20	
Turbidity	NTU	11/19/2013	N001	-37	-	-52	1.27		F	#		
Uranium	mg/L	11/19/2013	N001	-37	-	-52	0.00017		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0423 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Calcium	mg/L	11/20/2013	N001	-34.7	-49.7	140		F	#	0.012	
Chloride	mg/L	11/20/2013	N001	-34.7	-49.7	21		F	#	1	
Iron	mg/L	11/20/2013	N001	-34.7	-49.7	19		F	#	0.0049	
Lead	mg/L	11/20/2013	N001	-34.7	-49.7	0.0021		F	#	0.000068	
Magnesium	mg/L	11/20/2013	N001	-34.7	-49.7	39		F	#	0.013	
Manganese	mg/L	11/20/2013	N001	-34.7	-49.7	1.9		F	#	0.00011	
Molybdenum	mg/L	11/20/2013	N001	-34.7	-49.7	0.0089		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/20/2013	N001	-34.7	-49.7	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	11/20/2013	N001	-34.7	-49.7	-107.6		F	#		
pH	s.u.	11/20/2013	N001	-34.7	-49.7	6.86		F	#		
Potassium	mg/L	11/20/2013	N001	-34.7	-49.7	11		F	#	0.11	
Selenium	mg/L	11/20/2013	N001	-34.7	-49.7	0.000073	B	F	#	0.000032	
Sodium	mg/L	11/20/2013	N001	-34.7	-49.7	23		F	#	0.0066	
Specific Conductance	umhos/cm	11/20/2013	N001	-34.7	-49.7	1089		F	#		
Sulfate	mg/L	11/20/2013	N001	-34.7	-49.7	21		F	#	2.5	
Temperature	C	11/20/2013	N001	-34.7	-49.7	10.49		F	#		
Total Dissolved Solids	mg/L	11/20/2013	N001	-34.7	-49.7	600		F	#	20	
Turbidity	NTU	11/20/2013	N001	-34.7	-49.7	3.77		F	#		
Uranium	mg/L	11/20/2013	N001	-34.7	-49.7	0.00039		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0424 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Calcium	mg/L	11/20/2013	N001	-34.2	-	-44.2	140	F	#	0.012	
Chloride	mg/L	11/20/2013	N001	-34.2	-	-44.2	24	F	#	1	
Iron	mg/L	11/20/2013	N001	-34.2	-	-44.2	4.2	F	#	0.0049	
Lead	mg/L	11/20/2013	N001	-34.2	-	-44.2	0.00079	F	#	0.000068	
Magnesium	mg/L	11/20/2013	N001	-34.2	-	-44.2	36	F	#	0.013	
Manganese	mg/L	11/20/2013	N001	-34.2	-	-44.2	5.7	F	#	0.00011	
Molybdenum	mg/L	11/20/2013	N001	-34.2	-	-44.2	0.014	F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/20/2013	N001	-34.2	-	-44.2	0.048	F	#	0.01	
Oxidation Reduction Potential	mV	11/20/2013	N001	-34.2	-	-44.2	-29.9	F	#		
pH	s.u.	11/20/2013	N001	-34.2	-	-44.2	6.6	F	#		
Potassium	mg/L	11/20/2013	N001	-34.2	-	-44.2	8.1	F	#	0.11	
Selenium	mg/L	11/20/2013	N001	-34.2	-	-44.2	0.000071	B	F	#	0.000032
Sodium	mg/L	11/20/2013	N001	-34.2	-	-44.2	22	F	#	0.0066	
Specific Conductance	umhos/cm	11/20/2013	N001	-34.2	-	-44.2	1041	F	#		
Sulfate	mg/L	11/20/2013	N001	-34.2	-	-44.2	95	F	#	2.5	
Temperature	C	11/20/2013	N001	-34.2	-	-44.2	11.54	F	#		
Total Dissolved Solids	mg/L	11/20/2013	N001	-34.2	-	-44.2	630	F	#	20	
Turbidity	NTU	11/20/2013	N001	-34.2	-	-44.2	4.8	F	#		
Uranium	mg/L	11/20/2013	N001	-34.2	-	-44.2	0.00063	F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0520 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Calcium	mg/L	11/19/2013	N001	-103.8	-158.8	26		F	#	0.012	
Chloride	mg/L	11/19/2013	N001	-103.8	-158.8	16		F	#	0.2	
Dissolved Oxygen	mg/L	11/19/2013	N001	-103.8	-158.8	0.34		F	#		
Iron	mg/L	11/19/2013	N001	-103.8	-158.8	0.15		F	#	0.0049	
Lead	mg/L	11/19/2013	N001	-103.8	-158.8	0.00021	B	F	#	0.000068	
Magnesium	mg/L	11/19/2013	N001	-103.8	-158.8	9.9		F	#	0.013	
Manganese	mg/L	11/19/2013	N001	-103.8	-158.8	0.034		F	#	0.00011	
Molybdenum	mg/L	11/19/2013	N001	-103.8	-158.8	0.0013		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	-103.8	-158.8	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	11/19/2013	N001	-103.8	-158.8	-69.3		F	#		
pH	s.u.	11/19/2013	N001	-103.8	-158.8	7.46		F	#		
Potassium	mg/L	11/19/2013	N001	-103.8	-158.8	0.97	B	F	#	0.11	
Selenium	mg/L	11/19/2013	N001	-103.8	-158.8	0.000032	U	F	#	0.000032	
Sodium	mg/L	11/19/2013	N001	-103.8	-158.8	54		F	#	0.0066	
Specific Conductance	umhos/cm	11/19/2013	N001	-103.8	-158.8	468		F	#		
Sulfate	mg/L	11/19/2013	N001	-103.8	-158.8	21		F	#	0.5	
Temperature	C	11/19/2013	N001	-103.8	-158.8	11.19		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	-103.8	-158.8	260		F	#	20	
Turbidity	NTU	11/19/2013	N001	-103.8	-158.8	0.37		F	#		
Uranium	mg/L	11/19/2013	N001	-103.8	-158.8	0.000029	U	F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0522 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Calcium	mg/L	11/19/2013	N001	-103.5 - -156.7	0.66	B	F	#	0.012	
Calcium	mg/L	11/19/2013	N002	-103.5 - -156.7	0.67	B	F	#	0.012	
Chloride	mg/L	11/19/2013	N001	-103.5 - -156.7	7		F	#	0.2	
Chloride	mg/L	11/19/2013	N002	-103.5 - -156.7	6.8		F	#	0.2	
Dissolved Oxygen	mg/L	11/19/2013	N001	-103.5 - -156.7	0.28		F	#		
Iron	mg/L	11/19/2013	N001	-103.5 - -156.7	0.0086	B	UF	#	0.0049	
Iron	mg/L	11/19/2013	N002	-103.5 - -156.7	0.0063	B	UF	#	0.0049	
Lead	mg/L	11/19/2013	N001	-103.5 - -156.7	0.000068	U	F	#	0.000068	
Lead	mg/L	11/19/2013	N002	-103.5 - -156.7	0.000068	U	F	#	0.000068	
Magnesium	mg/L	11/19/2013	N001	-103.5 - -156.7	0.2	B	UF	#	0.013	
Magnesium	mg/L	11/19/2013	N002	-103.5 - -156.7	0.19	B	UF	#	0.013	
Manganese	mg/L	11/19/2013	N001	-103.5 - -156.7	0.00094	B	F	#	0.00011	
Manganese	mg/L	11/19/2013	N002	-103.5 - -156.7	0.0011	B	F	#	0.00011	
Molybdenum	mg/L	11/19/2013	N001	-103.5 - -156.7	0.00048	B	F	#	0.00032	
Molybdenum	mg/L	11/19/2013	N002	-103.5 - -156.7	0.00043	B	F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	-103.5 - -156.7	0.01	U	F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N002	-103.5 - -156.7	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	11/19/2013	N001	-103.5 - -156.7	-107.1		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0522 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
pH	s.u.	11/19/2013	N001	-103.5	-	-156.7	9.7		F	#		
Potassium	mg/L	11/19/2013	N001	-103.5	-	-156.7	2.1		F	#	0.11	
Potassium	mg/L	11/19/2013	N002	-103.5	-	-156.7	1.6		F	#	0.11	
Selenium	mg/L	11/19/2013	N001	-103.5	-	-156.7	0.000032	U	F	#	0.000032	
Selenium	mg/L	11/19/2013	N002	-103.5	-	-156.7	0.000032	U	F	#	0.000032	
Sodium	mg/L	11/19/2013	N001	-103.5	-	-156.7	160		F	#	0.033	
Sodium	mg/L	11/19/2013	N002	-103.5	-	-156.7	150		F	#	0.033	
Specific Conductance	umhos/cm	11/19/2013	N001	-103.5	-	-156.7	692		F	#		
Sulfate	mg/L	11/19/2013	N001	-103.5	-	-156.7	4.6		F	#	0.5	
Sulfate	mg/L	11/19/2013	N002	-103.5	-	-156.7	4.8		F	#	0.5	
Temperature	C	11/19/2013	N001	-103.5	-	-156.7	10.82		F	#		
Total Dissolved Solids	mg/L	11/19/2013	N001	-103.5	-	-156.7	400		F	#	20	
Total Dissolved Solids	mg/L	11/19/2013	N002	-103.5	-	-156.7	390		F	#	20	
Turbidity	NTU	11/19/2013	N001	-103.5	-	-156.7	0.93		F	#		
Uranium	mg/L	11/19/2013	N001	-103.5	-	-156.7	0.000029	U	F	#	0.000029	
Uranium	mg/L	11/19/2013	N002	-103.5	-	-156.7	0.000029	U	F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0523 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Calcium	mg/L	11/20/2013	N001	-107.5	-156	1.1		F	#	0.012	
Chloride	mg/L	11/20/2013	N001	-107.5	-156	4.4		F	#	0.2	
Iron	mg/L	11/20/2013	N001	-107.5	-156	0.022	B	UF	#	0.0049	
Lead	mg/L	11/20/2013	N001	-107.5	-156	0.000068	U	F	#	0.000068	
Magnesium	mg/L	11/20/2013	N001	-107.5	-156	0.3	B	UF	#	0.013	
Manganese	mg/L	11/20/2013	N001	-107.5	-156	0.013		F	#	0.00011	
Molybdenum	mg/L	11/20/2013	N001	-107.5	-156	0.0015		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/20/2013	N001	-107.5	-156	0.029		F	#	0.01	
Oxidation Reduction Potential	mV	11/20/2013	N001	-107.5	-156	-115.6		F	#		
pH	s.u.	11/20/2013	N001	-107.5	-156	9.22		F	#		
Potassium	mg/L	11/20/2013	N001	-107.5	-156	0.55	B	F	#	0.11	
Selenium	mg/L	11/20/2013	N001	-107.5	-156	0.00005	B	F	#	0.000032	
Sodium	mg/L	11/20/2013	N001	-107.5	-156	280		F	#	0.033	
Specific Conductance	umhos/cm	11/20/2013	N001	-107.5	-156	1132		F	#		
Sulfate	mg/L	11/20/2013	N001	-107.5	-156	0.5	U	F	#	0.5	
Temperature	C	11/20/2013	N001	-107.5	-156	10.69		F	#		
Total Dissolved Solids	mg/L	11/20/2013	N001	-107.5	-156	650		F	#	20	
Turbidity	NTU	11/20/2013	N001	-107.5	-156	0.55		F	#		
Uranium	mg/L	11/20/2013	N001	-107.5	-156	0.00022		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0524 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Calcium	mg/L	11/20/2013	N001	-103.7	-152.2	1.3		F	#	0.012	
Chloride	mg/L	11/20/2013	N001	-103.7	-152.2	19		F	#	1	
Iron	mg/L	11/20/2013	N001	-103.7	-152.2	0.026	B	UF	#	0.0049	
Lead	mg/L	11/20/2013	N001	-103.7	-152.2	0.00033	B	F	#	0.000068	
Magnesium	mg/L	11/20/2013	N001	-103.7	-152.2	0.25	B	UF	#	0.013	
Manganese	mg/L	11/20/2013	N001	-103.7	-152.2	0.0069		F	#	0.00011	
Molybdenum	mg/L	11/20/2013	N001	-103.7	-152.2	0.0014		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/20/2013	N001	-103.7	-152.2	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	11/20/2013	N001	-103.7	-152.2	-179		F	#		
pH	s.u.	11/20/2013	N001	-103.7	-152.2	9.22		F	#		
Potassium	mg/L	11/20/2013	N001	-103.7	-152.2	0.41	B	F	#	0.11	
Selenium	mg/L	11/20/2013	N001	-103.7	-152.2	0.000038	B	F	#	0.000032	
Sodium	mg/L	11/20/2013	N001	-103.7	-152.2	220		F	#	0.033	
Specific Conductance	umhos/cm	11/20/2013	N001	-103.7	-152.2	1029		F	#		
Sulfate	mg/L	11/20/2013	N001	-103.7	-152.2	130		F	#	2.5	
Temperature	C	11/20/2013	N001	-103.7	-152.2	11.65		F	#		
Total Dissolved Solids	mg/L	11/20/2013	N001	-103.7	-152.2	590		F	#	20	
Turbidity	NTU	11/20/2013	N001	-103.7	-152.2	1.44		F	#		
Uranium	mg/L	11/20/2013	N001	-103.7	-152.2	0.00012		F	#	0.000029	

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.

Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE CAN03, Burrell Disposal Site

REPORT DATE: 01/20/2014

Location: 0611 SURFACE LOCATION RESERVED JFRITZ, SUR SAMP, 7/26/90

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Calcium	mg/L	11/19/2013	N001	130			#	0.012	
Chloride	mg/L	11/19/2013	N001	19			#	1	
Iron	mg/L	11/19/2013	N001	15			#	0.0049	
Lead	mg/L	11/19/2013	N001	0.00061			#	0.000068	
Magnesium	mg/L	11/19/2013	N001	27			#	0.013	
Manganese	mg/L	11/19/2013	N001	2.8			#	0.00011	
Molybdenum	mg/L	11/19/2013	N001	0.0073			#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	11/19/2013	N001	0.01	U		#	0.01	
Oxidation Reduction Potential	mV	11/19/2013	N001	-96.9			#		
pH	s.u.	11/19/2013	N001	7.08			#		
Potassium	mg/L	11/19/2013	N001	5.7			#	0.11	
Selenium	mg/L	11/19/2013	N001	0.000077	B		#	0.000032	
Sodium	mg/L	11/19/2013	N001	17			#	0.0066	
Specific Conductance	umhos/cm	11/19/2013	N001	969			#		
Sulfate	mg/L	11/19/2013	N001	61			#	2.5	
Temperature	C	11/19/2013	N001	11.35			#		
Total Dissolved Solids	mg/L	11/19/2013	N001	550			#	20	
Turbidity	NTU	11/19/2013	N001	3.37			#		
Uranium	mg/L	11/19/2013	N001	0.00032			#	0.000029	

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.

Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 01/20/2014

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0420	U	984.95	11/19/2013	14:48:06	33.2	951.75
0422	C	984.56	11/19/2013	10:14:39	33.47	951.09
0423	D	981.92	11/20/2013	08:15:59	35.62	946.3
0424	D	980.71	11/20/2013	10:30:26	35.11	945.6
0520	U	985.35	11/19/2013	12:08:06	37.68	947.67
0522	C	985.09	11/19/2013	11:07:20	46.42	938.67
0523	D	982.08	11/20/2013	08:59:16	41.41	940.67
0524	D	980.08	11/20/2013	09:40:58	41.4	938.68

FLOW CODES: B BACKGROUND
 N UNKNOWN

C CROSS GRADIENT
 O ON SITE

D DOWN GRADIENT
 U UPGRADIENT

F OFF SITE

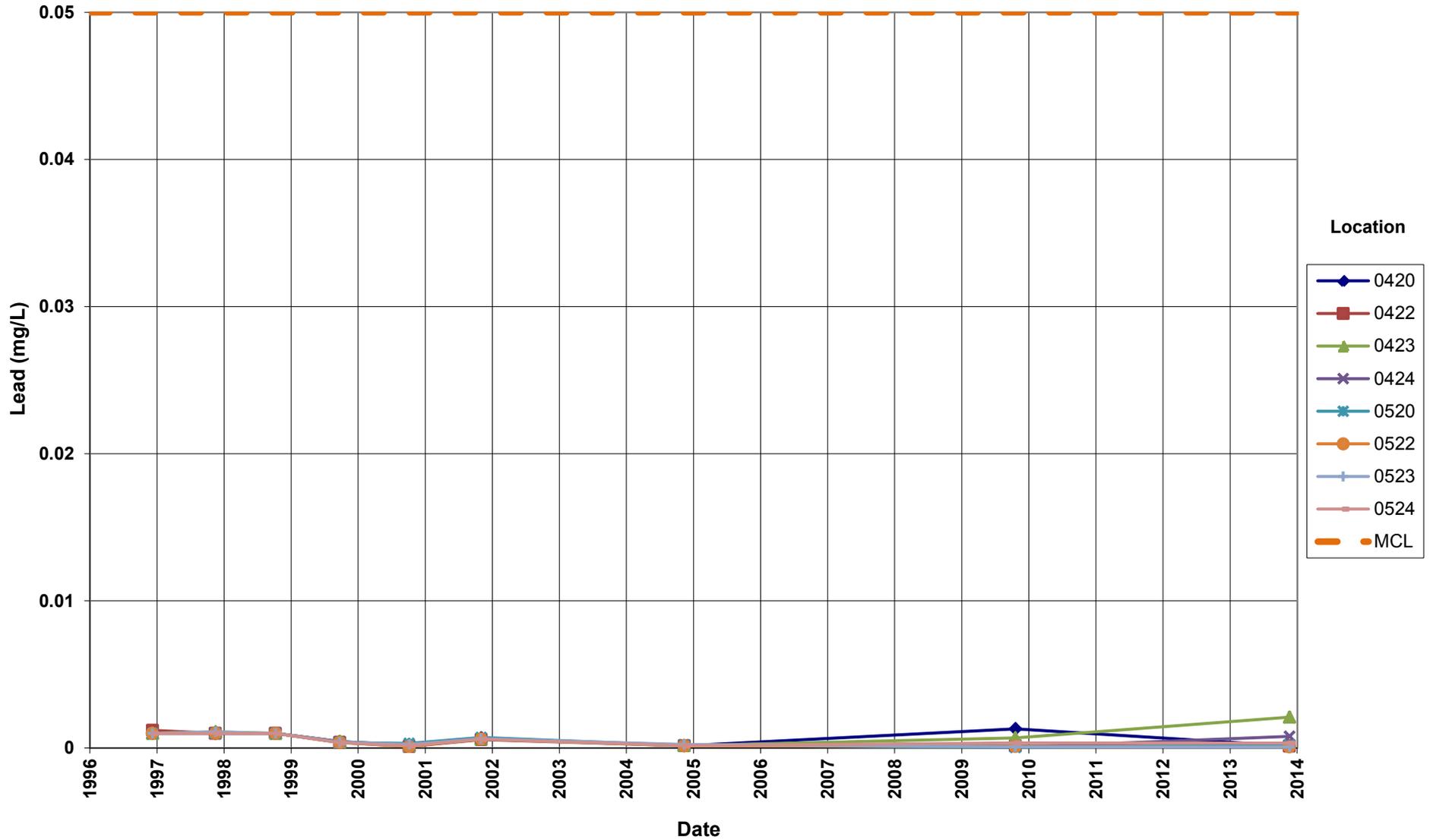
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Time-Concentration Graphs

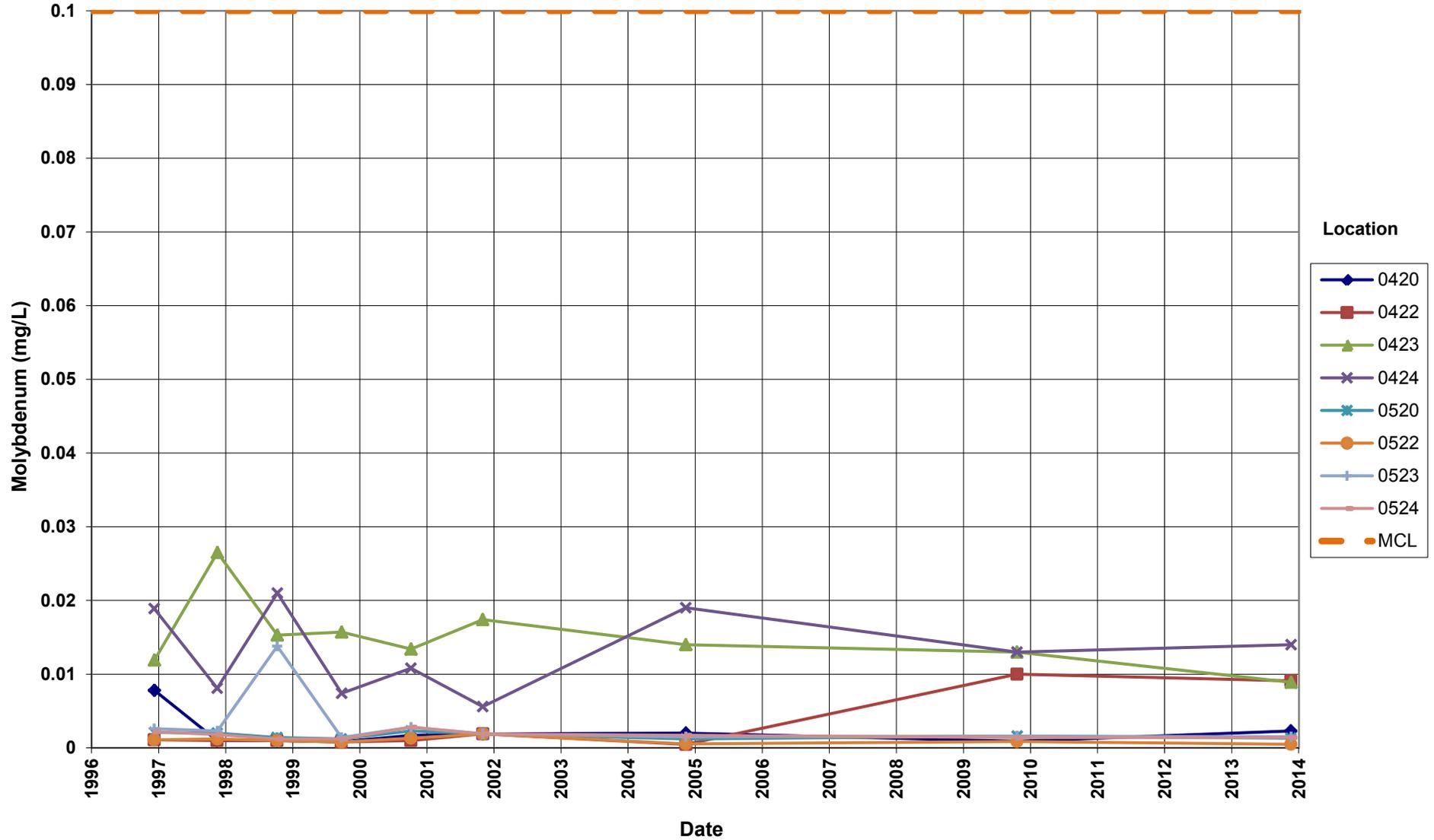
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Burrell Disposal Site Lead Concentration

40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.05 mg/L

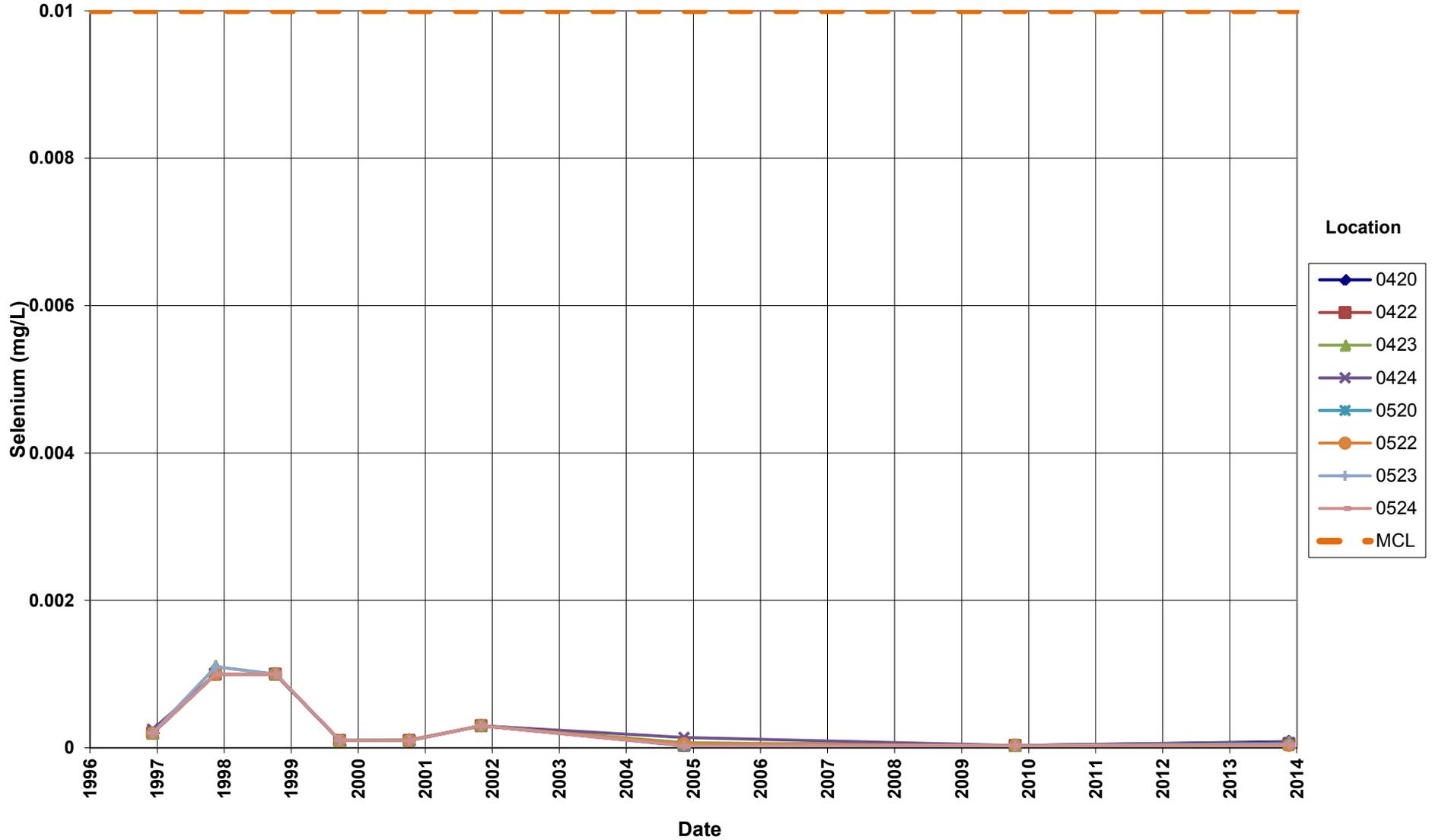


Burrell Disposal Site
Molybdenum Concentration
40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.10 mg/L



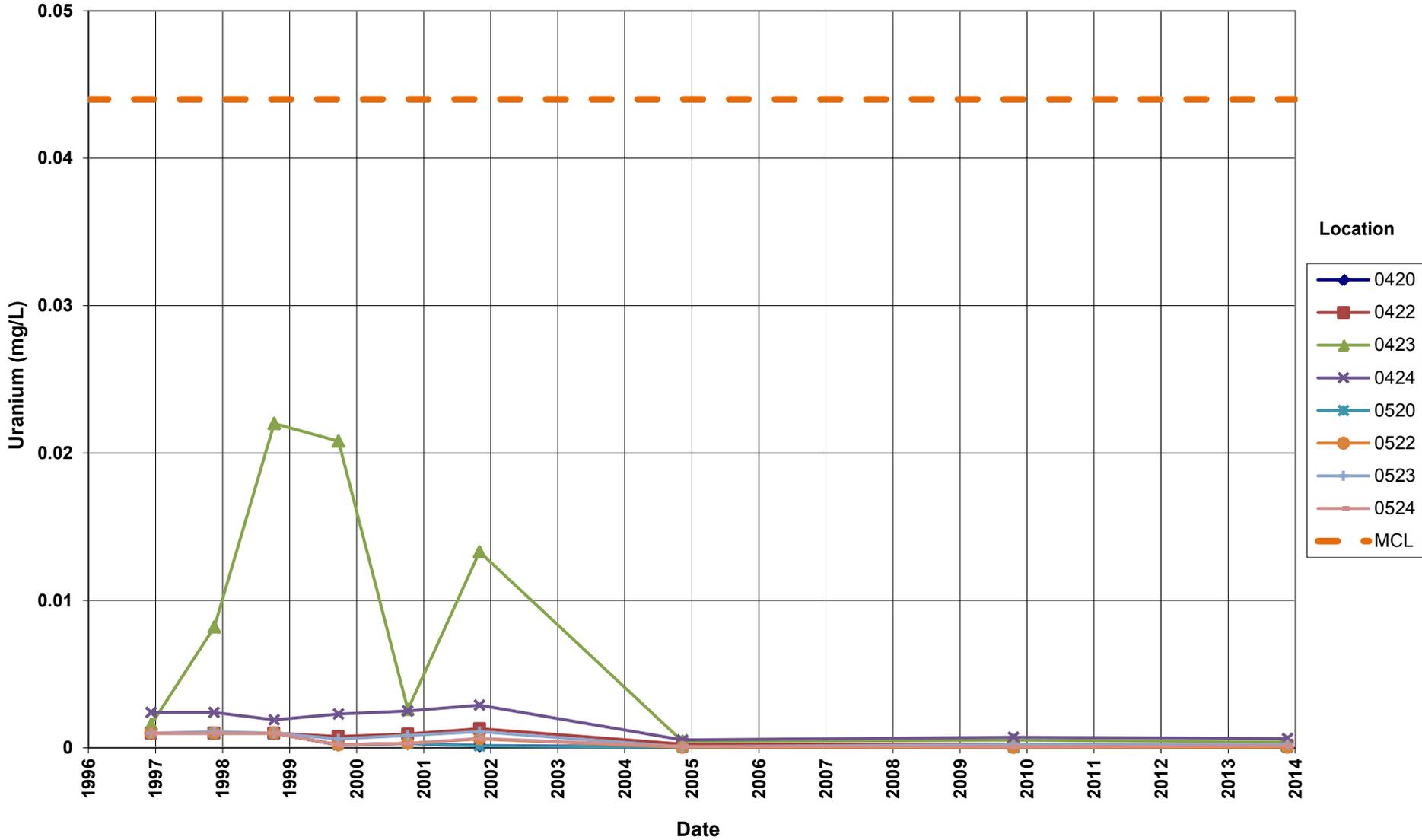
Burrell Disposal Site Selenium Concentration

40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.01 mg/L



Burrell Disposal Site Uranium Concentration

40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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established 1959

Task Order LM-501
Control Number 13-0838

September 25, 2013

U.S. Department of Energy
Office of Legacy Management
ATTN: Clifford Carpenter
Site Manager
99 Research Park Rd.
Morgantown, WV 26505

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
October 2013 Environmental Sampling at the Burrell, Pennsylvania,
Disposal Site

REFERENCE: Task Order LM00-501-02-103-402, Burrell, Pennsylvania, Disposal Site

Dear Mr. Carpenter:

The purpose of this letter is to inform you of the upcoming sampling event at Burrell, Pennsylvania. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Burrell site. Water quality data will be collected from monitoring wells and surface locations at this site as part of the routine environmental sampling currently scheduled to begin the week of October 14, 2013.

The following lists show the monitoring wells (along with associated zone of completion) and surface locations scheduled for sampling during this event.

Monitoring Wells*

420 Al 423 Al 424 Al 520 Cs 522 Cs 523 Cs 524 Cs
422 Al

*NOTE: Al = Alluvium; Cs = Castleman Formation

Surface Locations*

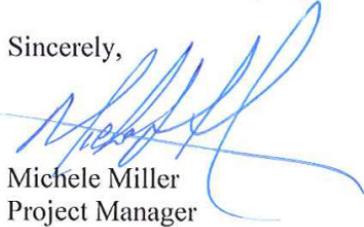
611 612

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.

Clifford Carpenter
Control Number 13-0838
Page 2

Please contact me at (412) 818-7015 if you have any questions.

Sincerely,



Michele Miller
Project Manager

MM/lcg/lb

Enclosures (3)

cc: (electronic)

Christina Pennal, DOE
Steve Donovan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Michele Miller, Stoller
EDD Delivery
rc-grand.junction
File: BUR 410.02(A)

Sampling Frequencies for Locations at Burrell, Pennsylvania

Location ID	Quarterly	Semiannually	Annually	Biennially	Every 5 Years	Notes
Monitoring Wells						
420					X	Next in October 2013
422					X	Next in October 2013
423					X	Next in October 2013
424					X	Next in October 2013
520					X	Next in October 2013
522					X	Next in October 2013
523					X	Next in October 2013
524					X	Next in October 2013
Surface Locations						
611					X	SEEP on cell; next in 10/13
612					X	SEEP on cell; next in 10/13

Sampling conducted in October
Based on LTSP dated April 2000

Constituent Sampling Breakdown

Site	Burrell		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Approx. No. Samples/yr	8	2			
<i>Field Measurements</i>					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X	X			
Temperature	X	X			
<i>Laboratory Measurements</i>					
Aluminum					
Ammonia as N (NH3-N)					
Calcium	X	X	5	SW-846 6010	LMM-02
Chloride	X	X	0.5	SW-846 9056	MIS-A-039
Chromium					
Gross Alpha					
Gross Beta					
Iron	X	X	0.05	SW-846 6020	LMM-02
Lead	X	X	0.002	SW-846 6020	LMM-02
Magnesium	X	X	5	SW-846 6010	LMM-01
Manganese	X	X	0.005	SW-846 6010	LMM-01
Molybdenum	X	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO ₃ +NO ₂)-N	X	X	0.05	EPA 353.1	WCH-A-022
Potassium	X	X	1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium	X	X	0.0001	SW-846 6020	LMM-02
Silica					
Sodium	X	X	1	SW-846 6010	LMM-01
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	X	X	10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	14	14			

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

**Attachment 4
Trip Report**

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Memorandum

Control Number N/A

DATE: January 6, 2014

TO: Ken Broberg

FROM: Mike Stott

SUBJECT: Trip Report

Site: Burrell, PA

Dates of Sampling Event: November 19 and 20, 2013

Team Members: Mike Stott, Roy Mowen, Bill Gutzwiller

Number of Locations Sampled: 8 monitoring wells, 1 surface water sample, and one duplicate sample.

Table 1. Locations Sampled

Ticket Number	Location	Sample Date	Well Type	Comments	Water Levels
LKX 062	0420	11/19/13	CAT I	N/A	33.20
LKX 063	0422	11/19/13	CAT I	N/A	33.47
LKX 064	0423	11/20/13	CAT I	Duplicate Collected	35.62
LKX 065	0424	11/20/13	CAT I	N/A	35.11
LKX 066	0520	11/19/13	CAT I	N/A	37.68
LKX 067	0522	11/19/13	CAT I	N/A	46.42
LKX 068	0523	11/20/13	CAT I	N/A	41.41
LKX 069	0524	11/20/13	CAT I	N/A	41.40
LKX 071	0611	11/19/13	Surface water	N/A	N/A

RIN Number Assigned: 13095638

Sample Shipment: Samples were shipped overnight by FedEx to ALS Laboratory Group, Fort Collins, Colorado, on November 21 2013.

Locations Not Sampled/Reason: Surface water location 612 is a seep that is currently not producing water.

Field Variance: None

Quality Control Sample Cross Reference: One duplicate sample was collected for this event. Table 3 lists the false identification number assigned to the sample collected for quality control.

Table 2. QC Sample Cross-Reference

False ID	True ID	Sample Type	Date Sampled	Notes
2820	0522	Duplicate	10/19/09	N/A

Water Level Measurements: Water levels were collected from all sampled monitoring wells.

Sampling Method: Monitoring wells were sampled using dedicated bladder pumps using the low flow purge method. The surface water sample was collected by container immersion.

Well Inspection Summary: Well inspections were performed at all sampled wells. Well 423 has a cracked pad and the pin holding the lid in place is bent. All other wells are in good condition.

Equipment: The Fernald Laptop computer with the Field Data Collection System, A Fernald YSI meter and turbidity meter were used. All other equipment and supplies were also from Fernald.

Site Issues: A section of the fence line that runs parallel to the river has been damaged from a falling limb or tree. The object that caused the damage was not evident as it must have been removed by someone prior to our trip.

The padlock for the entrance gate was cut off to allow us entry into the site. A non LM keyed padlock was purchased locally to replace it. It will be replaced with an LM keyed padlock during the next site inspection.

The stakes marking the location of the seeps were not there. Reflector style markers were purchased locally and the seep location numbers written on them as they were placed to mark the seeps.

Notes for the Next Trip: None.