

Data Validation Package

May 2011
Groundwater Sampling at the
Gunnison, Colorado, Disposal Site

August 2011



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

Site: Gunnison, Colorado, Disposal Site

Sampling Period: May 25, 2011

Groundwater sampling at the Gunnison, Colorado, Disposal Site is conducted every 5 years to monitor disposal cell performance. During this event, samples were collected from eight monitoring wells as specified in the 1997 *Long-Term Surveillance Plan for the Gunnison, Colorado, Disposal Site*. All sampled wells were re-developed prior to sampling. Sampling and analysis was conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated). A duplicate sample was collected from location 0720.

Water levels were measured at all monitoring wells that were sampled and nine additional wells. The hydrograph included in this report shows no significant changes in the local hydrologic conditions.

As shown in Table 1, uranium concentrations in the disposal site point of compliance (POC) wells remain below the action level of 0.013 mg/L, indicating adequate disposal cell performance.

Table 1. Gunnison Disposal Site Uranium Concentrations

Analyte	Action Level ^a	Location	Concentration ^a
Uranium	0.013	0609	0.004
		0716	0.002
		0720	0.005
		0721	0.001
		0722	0.002
		0723	0.003
		0724	0.001
		0725	0.003

^a Units are in mg/L.

Time-concentration graphs of sample results from background wells (0609 and 0716) are comparable to historical results and comparable to results from POC wells, which indicates no significant changes in general water quality.



Sam Campbell
Site Lead, S.M. Stoller Corporation

8-12-11

Date

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LEGEND LOCATION TO BE SAMPLED ● MONITOR WELL ● MONITOR WELL - WATER LEVEL ONLY - - SITE BOUNDARY	N SCALE IN FEET 1,000 500 0 1,000 		U.S. DEPARTMENT OF ENERGY <small>GRAND JUNCTION, COLORADO</small>	<small>Work Performed by</small> S.M. Stoller Corporation <small>Under DOE Contract No. DE-AM01-07LM00060</small>
	Planned Sampling Map Gunnison, CO, Disposal Site May 2011			
	<small>DATE PREPARED</small> April 8, 2011	<small>FILENAME</small> S0769200		

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Gunnison, Colorado, Disposal Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	<u>Gunnison, Colorado, Disposal Site</u>	Date(s) of Water Sampling	<u>May 25, 2011</u>
Date(s) of Verification	<u>August 1, 2011</u>	Name of Verifier	<u>Steve Donovan</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions.	<u>Yes</u>	<u>Work Order letter dated April 14, 2011.</u>
2. Were the sampling locations specified in the planning documents sampled?	<u>Yes</u>	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	<u>Yes</u>	<u>Pre-trip calibrations were performed May 23 and 24, 2011.</u>
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	<u>Yes</u>	<u>Two operational checks were performed on May 25, 2011.</u>
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	<u>Yes</u>	
6. Was the category of the well documented?	<u>Yes</u>	<u>All sampled wells were Category I wells.</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 stabilize prior to sampling?	<u>Yes</u>	
Was the flow rate less than 500 mL/min?	<u>Yes</u>	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	<u>NA</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?	NA	
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 from well 0720.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	Dedicated equipment was used for all sampling.
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	Location ID 2158 was used for the duplicate sample.
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	Sample filtration was not required.
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	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 11053801
Sample Event: May 25, 2011
Site(s): Gunnison, Colorado, Disposal Site
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1105427
Analysis: Metals
Validator: Steve Donovan
Review Date: August 1, 2011

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325), "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 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Metals: Calcium, Iron, Potassium, Magnesium, Manganese, Sodium	LMM-01	SW-846 3005A	SW-846 6010B
Metals: Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
Total Dissolved Solids	WCH-A-033	EPA 160.1	EPA 160.1

Data Qualifier Summary

The analytical results were qualified as listed in Table 3. Refer to the sections below for an explanation of the data qualifiers applied.

Table 3. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
1105427-1	0609	Iron	J	Negative calibration blank
1105427-1	0609	Magnesium	J	Serial dilution failure
1105427-9	0720 Duplicate	Iron	J	Negative calibration blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received nine water samples on May 27, 2011, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form and that signatures and dates were present, indicating

sample relinquishment and receipt. The sample submittal documents including the COC form, and the sample tickets had no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 5.6 °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.

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 160.1, Total Dissolved Solids

There are no initial or continuing calibration requirements associated with the determination of total dissolved solids.

Method SW-846 6010B, Metals

Calibrations were performed for manganese on June 15, 2011. The initial calibration was performed using three calibration standards resulting in a calibration curve with a correlation coefficient value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in 10 verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit (PQL). All check results were within the acceptance range.

Method SW-846 6020A, Uranium

Calibration was performed for uranium on June 16, 2011. The initial calibration was performed using four calibration standards resulting in a calibration curve with a correlation coefficient value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in nine verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the PQL. All check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method SW-846 9056, Chloride, Sulfate

Calibrations for chloride and sulfate were performed using five calibration standards on April 26, 2011. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency and all calibration checks met 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. All method blank and initial and continuing calibration blank results were below the PQLs. Many of the metals blanks were negative, with the absolute values greater than the method detection limit, but less than the PQL. Associated sample results that are less than 5 times the detection limit are qualified with a “J” flag as estimated values.

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

ICP interference check samples ICSA and ICSAB 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 pairs were analyzed for manganese and uranium as a measure of method performance in the sample matrix. The matrix spike and matrix spike duplicate recoveries met the acceptance criteria for all analytes.

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 five 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 laboratory control sample results were acceptable for all analysis.

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 PQL for method 6010 analytes, or 100 times the PQL for method 6020 analytes. The serial dilution data met the

acceptance criteria for all data evaluated with the exception of magnesium. The associated sample magnesium result is qualified with a “J” flag as an estimated value.

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.

Electronic Data Deliverable (EDD) File

The EDD file arrived on June 24, 2011. 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.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 11053801 Lab Code: PAR Validator: Steve Donovan Validation Date: 7/29/2011

Project: Gunnison Analysis Type: Metals General Chem Rad Organics

of Samples: 9 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: 11053801 Lab Code: PAR Date Due: 6/24/2011
 Matrix: Water Site Code: GUN Date Completed: 6/24/2011

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	06/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	96.0	95.0	99.0	2.0	102.0	1.0	99.0	
Iron	ICP/ES	06/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	94.0	94.0	95.0	1.0	106.0		95.0	
Magnesium	ICP/ES	06/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	97.0	95.0	96.0	1.0	103.0		104.0	
Manganese	ICP/ES	06/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	98.0	97.0	98.0	1.0	96.0		106.0	
Potassium	ICP/ES	06/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	98.0	111.0	110.0	0.0			78.0	
Sodium	ICP/ES	06/15/2011	0.0000	1.0000	OK	OK	OK	OK	OK	94.0	98.0	100.0	0.0		6.0	82.0	
Uranium	ICP/MS	06/16/2011	0.0000	1.0000	OK	OK	OK	OK	OK	105.0	108.0	104.0	3.0	102.0	3.0	120.0	

SAMPLE MANAGEMENT SYSTEM
Wet Chemistry Data Validation Worksheet

RIN: 11053801 Lab Code: PAR Date Due: 6/24/2011
 Matrix: Water Site Code: GUN Date Completed: 6/24/2011

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
CHLORIDE	06/07/2011	0.000	1.0000	OK	OK	OK	OK	OK	93.00				
SULFATE	06/07/2011	0.000	1.0000	OK	OK	OK	OK	OK	92.00				
TOTAL DISSOLVED SOLIDS	06/02/2011							OK	101.00			2.00	

Sampling Quality Control Assessment

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

Sampling Protocol

All monitoring wells were sampled using dedicated bladder pumps and were re-developed prior to sampling. Sample results were qualified with an “F” flag in the database indicating the wells were purged and sampled using the low-flow sampling method, meeting Category I criteria.

Equipment Blank Assessment

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. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. A duplicate sample was collected from location 0720. The duplicate results met these criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

Page 1 of 1

RIN: 11053801 Lab Code: PAR Project: Gunnison Validation Date: 7/29/2011

Duplicate: 2158

Sample: 0720

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Calcium	65000			1	64000			1	1.55		UG/L
CHLORIDE	13			1	14			1	7.41		MG/L
Iron	41	B		1	14	B		1			UG/L
Magnesium	6600			1	6500			1	1.53		UG/L
Manganese	24			1	22			1	8.70		UG/L
Potassium	10000			1	10000			1	0		UG/L
Sodium	57000			1	56000			1	1.77		UG/L
SULFATE	74			1	74			1	0		MG/L
TOTAL DISSOLVED SOLIDS	390			1	390			1	0		MG/L
Uranium	5			10	5			10	0		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
Steve Donivan

8-11-2011
Date

Data Validation Lead:

Steve Donivan
Steve Donivan

8-11-2011
Date

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 SEEPro database. The application compares the new data set 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.

Many of the iron and manganese results were identified as potential outliers. The wells sampled during this event were re-developed the day prior to sample collection and that re-development may have contributed to the elevated iron and manganese concentrations observed. The data for this event are acceptable as qualified.

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Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 11053801

Report Date: 8/1/2011

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Qualifiers Lab	Data	Result	Qualifiers Lab	Data	Result	Qualifiers Lab	Data	N	N Below Detect	
GUN08	0609	N001	05/25/2011	Calcium	47		F	36.4			19		F	15	0	No
GUN08	0609	N001	05/25/2011	Magnesium	4.8	E	FJ	3.37			1.5		F	15	0	No
GUN08	0609	N001	05/25/2011	Sulfate	93		F	89.8			73			15	0	No
GUN08	0716	N001	05/25/2011	Iron	0.77		F	0.153		F	0.014	U	FQ	16	4	Yes
GUN08	0716	N001	05/25/2011	Manganese	0.6		F	0.354		F	0.052		FQ	10	0	Yes
GUN08	0720	N001	05/25/2011	Chloride	13		F	15.2			13.6			9	0	No
GUN08	0720	N001	05/25/2011	Iron	0.041	B	F	0.0199	B		0.001	U		9	4	Yes
GUN08	0720	N001	05/25/2011	Magnesium	6.6		F	6.46			5.99			9	0	No
GUN08	0720	N002	05/25/2011	Magnesium	6.5		F	6.46			5.99			9	0	No
GUN08	0721	N001	05/25/2011	Iron	0.059	B	F	0.018	B	F	0.001	U		11	7	Yes
GUN08	0721	N001	05/25/2011	Potassium	1.1		F	2.26			1.44			11	0	No
GUN08	0722	N001	05/25/2011	Iron	0.33		F	0.017	B	F	0.001	U		10	8	Yes
GUN08	0722	N001	05/25/2011	Manganese	0.016		F	0.0021	B		0.00023	U	FJ	10	7	Yes
GUN08	0723	N001	05/25/2011	Iron	0.04	B	F	0.0159	B	U	0.001	U		9	8	Yes
GUN08	0723	N001	05/25/2011	Manganese	0.0042	B	F	0.0023	B		0.00023	U	FJ	9	5	Yes
GUN08	0723	N001	05/25/2011	Potassium	2.4		F	5.67		L	2.61			9	0	No
GUN08	0724	N001	05/25/2011	Chloride	6		F	5.2		F	0.334	B	UL	10	1	No
GUN08	0724	N001	05/25/2011	Potassium	2.2		F	4.17		L	2.42		L	10	0	No

Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 11053801

Report Date: 8/1/2011

Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Current Qualifiers		Historical Maximum Qualifiers			Historical Minimum Qualifiers			Number of Data Points		Statistical Outlier
						Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
GUN08	0725	N001	05/25/2011	Calcium	42		F	41		F	31.8			9	0	No
GUN08	0725	N001	05/25/2011	Iron	0.063	B	F	0.014	U	F	0.001	U		9	7	Yes
GUN08	0725	N001	05/25/2011	Potassium	5.6		F	7.66			5.62			9	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 GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0609 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	136.09 - 146.09	47		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	136.09 - 146.09	17		F	#	0.2	
Iron	mg/L	05/25/2011	N001	136.09 - 146.09	0.0056	B	FJ	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	136.09 - 146.09	4.8	E	FJ	#	0.013	
Manganese	mg/L	05/25/2011	N001	136.09 - 146.09	0.0068	E	F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	136.09 - 146.09	45.4		F	#		
pH	s.u.	05/25/2011	N001	136.09 - 146.09	7.67		F	#		
Potassium	mg/L	05/25/2011	N001	136.09 - 146.09	11	E	F	#	0.11	
Sodium	mg/L	05/25/2011	N001	136.09 - 146.09	75		F	#	0.0066	
Specific Conductance	umhos/cm	05/25/2011	N001	136.09 - 146.09	606		F	#		
Sulfate	mg/L	05/25/2011	N001	136.09 - 146.09	93		F	#	0.5	
Temperature	C	05/25/2011	N001	136.09 - 146.09	10.29		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	136.09 - 146.09	390		F	#	20	
Turbidity	NTU	05/25/2011	N001	136.09 - 146.09	6.9		F	#		
Uranium	mg/L	05/25/2011	N001	136.09 - 146.09	0.0038		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0716 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	183.44 - 223.44	39		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	183.44 - 223.44	4.6		F	#	0.2	
Iron	mg/L	05/25/2011	N001	183.44 - 223.44	0.77		F	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	183.44 - 223.44	5.4		F	#	0.013	
Manganese	mg/L	05/25/2011	N001	183.44 - 223.44	0.6		F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	183.44 - 223.44	105.3		F	#		
pH	s.u.	05/25/2011	N001	183.44 - 223.44	7.66		F	#		
Potassium	mg/L	05/25/2011	N001	183.44 - 223.44	13		F	#	0.11	
Sodium	mg/L	05/25/2011	N001	183.44 - 223.44	32		F	#	0.0066	
Specific Conductance	umhos/cm	05/25/2011	N001	183.44 - 223.44	407		F	#		
Sulfate	mg/L	05/25/2011	N001	183.44 - 223.44	32		F	#	0.5	
Temperature	C	05/25/2011	N001	183.44 - 223.44	10.74		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	183.44 - 223.44	260		F	#	20	
Turbidity	NTU	05/25/2011	N001	183.44 - 223.44	6.94		F	#		
Uranium	mg/L	05/25/2011	N001	183.44 - 223.44	0.0022		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0720 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	126	- 136	65		F	#	0.012	
Calcium	mg/L	05/25/2011	N002	126	- 136	64		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	126	- 136	13		F	#	0.2	
Chloride	mg/L	05/25/2011	N002	126	- 136	14		F	#	0.2	
Iron	mg/L	05/25/2011	N001	126	- 136	0.041	B	F	#	0.0049	
Iron	mg/L	05/25/2011	N002	126	- 136	0.014	B	FJ	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	126	- 136	6.6		F	#	0.013	
Magnesium	mg/L	05/25/2011	N002	126	- 136	6.5		F	#	0.013	
Manganese	mg/L	05/25/2011	N001	126	- 136	0.024		F	#	0.00011	
Manganese	mg/L	05/25/2011	N002	126	- 136	0.022		F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	126	- 136	65		F	#		
pH	s.u.	05/25/2011	N001	126	- 136	7.45		F	#		
Potassium	mg/L	05/25/2011	N001	126	- 136	10		F	#	0.11	
Potassium	mg/L	05/25/2011	N002	126	- 136	10		F	#	0.11	
Sodium	mg/L	05/25/2011	N001	126	- 136	57		F	#	0.0066	
Sodium	mg/L	05/25/2011	N002	126	- 136	56		F	#	0.0066	
Specific Conductance	umhos /cm	05/25/2011	N001	126	- 136	592		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0720 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Sulfate	mg/L	05/25/2011	N001	126 - 136	74		F	#	0.5	
Sulfate	mg/L	05/25/2011	N002	126 - 136	74		F	#	0.5	
Temperature	C	05/25/2011	N001	126 - 136	10.32		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	126 - 136	390		F	#	20	
Total Dissolved Solids	mg/L	05/25/2011	N002	126 - 136	390		F	#	20	
Turbidity	NTU	05/25/2011	N001	126 - 136	5.12		F	#		
Uranium	mg/L	05/25/2011	N001	126 - 136	0.005		F	#	0.000029	
Uranium	mg/L	05/25/2011	N002	126 - 136	0.005		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0721 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	147.5 - 157.5	28		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	147.5 - 157.5	3.9		F	#	0.2	
Iron	mg/L	05/25/2011	N001	147.5 - 157.5	0.059	B	F	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	147.5 - 157.5	3.7		F	#	0.013	
Manganese	mg/L	05/25/2011	N001	147.5 - 157.5	0.0011	B	F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	147.5 - 157.5	20.3		F	#		
pH	s.u.	05/25/2011	N001	147.5 - 157.5	7.35		F	#		
Potassium	mg/L	05/25/2011	N001	147.5 - 157.5	1.1		F	#	0.11	
Sodium	mg/L	05/25/2011	N001	147.5 - 157.5	13		F	#	0.0066	
Specific Conductance	umhos/cm	05/25/2011	N001	147.5 - 157.5	227		F	#		
Sulfate	mg/L	05/25/2011	N001	147.5 - 157.5	7.4		F	#	0.5	
Temperature	C	05/25/2011	N001	147.5 - 157.5	10.34		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	147.5 - 157.5	170		F	#	20	
Turbidity	NTU	05/25/2011	N001	147.5 - 157.5	1.72		F	#		
Uranium	mg/L	05/25/2011	N001	147.5 - 157.5	0.001		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0722 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	157 - 167	36		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	157 - 167	5.1		F	#	0.2	
Iron	mg/L	05/25/2011	N001	157 - 167	0.33		F	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	157 - 167	4.4		F	#	0.013	
Manganese	mg/L	05/25/2011	N001	157 - 167	0.016		F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	157 - 167	74.5		F	#		
pH	s.u.	05/25/2011	N001	157 - 167	7.4		F	#		
Potassium	mg/L	05/25/2011	N001	157 - 167	3.4		F	#	0.11	
Sodium	mg/L	05/25/2011	N001	157 - 167	15		F	#	0.0066	
Specific Conductance	umhos/cm	05/25/2011	N001	157 - 167	306		F	#		
Sulfate	mg/L	05/25/2011	N001	157 - 167	11		F	#	0.5	
Temperature	C	05/25/2011	N001	157 - 167	9.64		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	157 - 167	200		F	#	20	
Turbidity	NTU	05/25/2011	N001	157 - 167	8.8		F	#		
Uranium	mg/L	05/25/2011	N001	157 - 167	0.0018		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0723 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	147	- 157	40		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	147	- 157	13		F	#	0.2	
Iron	mg/L	05/25/2011	N001	147	- 157	0.04	B	F	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	147	- 157	4.7		F	#	0.013	
Manganese	mg/L	05/25/2011	N001	147	- 157	0.0042	B	F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	147	- 157	71.5		F	#		
pH	s.u.	05/25/2011	N001	147	- 157	7.53		F	#		
Potassium	mg/L	05/25/2011	N001	147	- 157	2.4		F	#	0.11	
Sodium	mg/L	05/25/2011	N001	147	- 157	16		F	#	0.0066	
Specific Conductance	umhos/cm	05/25/2011	N001	147	- 157	343		F	#		
Sulfate	mg/L	05/25/2011	N001	147	- 157	23		F	#	0.5	
Temperature	C	05/25/2011	N001	147	- 157	10.54		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	147	- 157	220		F	#	20	
Turbidity	NTU	05/25/2011	N001	147	- 157	4.31		F	#		
Uranium	mg/L	05/25/2011	N001	147	- 157	0.0027		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0724 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	127	- 137	31		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	127	- 137	6		F	#	0.2	
Iron	mg/L	05/25/2011	N001	127	- 137	0.098	B	F	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	127	- 137	3.5		F	#	0.013	
Manganese	mg/L	05/25/2011	N001	127	- 137	0.014		F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	127	- 137	80.7		F	#		
pH	s.u.	05/25/2011	N001	127	- 137	7.32		F	#		
Potassium	mg/L	05/25/2011	N001	127	- 137	2.2		F	#	0.11	
Sodium	mg/L	05/25/2011	N001	127	- 137	15		F	#	0.0066	
Specific Conductance	umhos/cm	05/25/2011	N001	127	- 137	267		F	#		
Sulfate	mg/L	05/25/2011	N001	127	- 137	11		F	#	0.5	
Temperature	C	05/25/2011	N001	127	- 137	10.67		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	127	- 137	170		F	#	20	
Turbidity	NTU	05/25/2011	N001	127	- 137	2.37		F	#		
Uranium	mg/L	05/25/2011	N001	127	- 137	0.0012		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN08, Gunnison Disposal Site

REPORT DATE: 8/1/2011

Location: 0725 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	05/25/2011	N001	130 - 140	42		F	#	0.012	
Chloride	mg/L	05/25/2011	N001	130 - 140	9.9		F	#	0.2	
Iron	mg/L	05/25/2011	N001	130 - 140	0.063	B	F	#	0.0049	
Magnesium	mg/L	05/25/2011	N001	130 - 140	3.6		F	#	0.013	
Manganese	mg/L	05/25/2011	N001	130 - 140	0.061		F	#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	130 - 140	28.1		F	#		
pH	s.u.	05/25/2011	N001	130 - 140	7.57		F	#		
Potassium	mg/L	05/25/2011	N001	130 - 140	5.6		F	#	0.11	
Sodium	mg/L	05/25/2011	N001	130 - 140	32		F	#	0.0066	
Specific Conductance	umhos/cm	05/25/2011	N001	130 - 140	384		F	#		
Sulfate	mg/L	05/25/2011	N001	130 - 140	29		F	#	0.5	
Temperature	C	05/25/2011	N001	130 - 140	10.96		F	#		
Total Dissolved Solids	mg/L	05/25/2011	N001	130 - 140	250		F	#	20	
Turbidity	NTU	05/25/2011	N001	130 - 140	5.07		F	#		
Uranium	mg/L	05/25/2011	N001	130 - 140	0.0026		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.

Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE GUN08, Gunnison Disposal Site
REPORT DATE: 8/1/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0609	O	8012.64	05/24/2011	07:04:00	105.14	7907.5
0609	O	8012.64	05/25/2011	15:10:47	105.14	7907.5
0630	O	8010.58	05/23/2011	17:49:00	103.13	7907.45
0634	O	7977.87	05/23/2011	17:57:00	70.73	7907.14
0663	O	8068.33	05/24/2011	07:55:00	164	7904.33
0709	D	7928.68	05/23/2011	18:06:00	57.2	7871.48
0710	U	8071	05/23/2011	17:44:00	108.6	7962.4
0712	D	7972.9	05/23/2011	18:13:00	99.31	7873.59
0714	D	7890.96	05/24/2011	06:59:00	62.84	7828.12
0715	D	8022.91	05/24/2011	07:30:00	131.43	7891.48
0716	D	8087.22	05/24/2011	08:02:00	179.75	7907.47
0716	D	8087.22	05/25/2011	10:55:12	179.75	7907.47
0717	D	8049.57	05/25/2011	17:00:00	163.92	7885.65
0720	D	8026.54	05/24/2011	08:18:00	118.34	7908.2
0720	D	8026.54	05/25/2011	16:10:23	118.34	7908.2
0721	D	8047.15	05/24/2011	08:08:00	138.4	7908.75
0721	D	8047.15	05/25/2011	15:40:23	138.4	7908.75
0722	D	8051.96	05/24/2011	07:35:00	147.05	7904.91
0722	D	8051.96	05/25/2011	09:25:25	147.05	7904.91
0723	D	8040.49	05/24/2011	07:26:00	136.61	7903.88
0723	D	8040.49	05/25/2011	10:05:09	136.61	7903.88
0724	D	8028.21	05/24/2011	07:23:00	127.79	7900.42
0724	D	8028.21	05/25/2011	11:40:53	127.79	7900.42
0725	D	8015.47	05/24/2011	07:16:00	116.33	7899.14
0725	D	8015.47	05/25/2011	14:05:37	116.33	7899.14

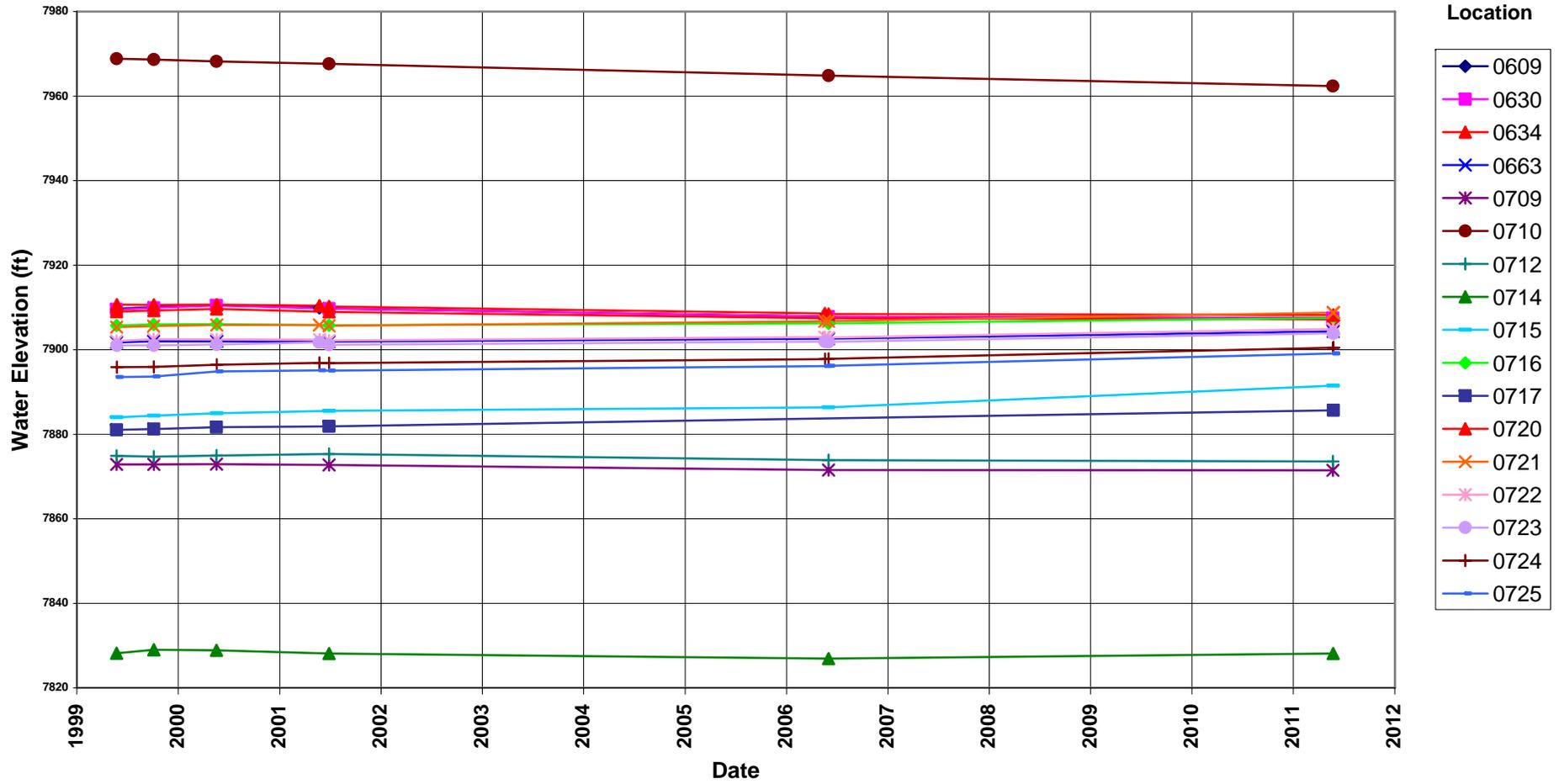
FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
 N UNKNOWN O ON SITE U UPGRADIENT

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Hydrograph

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Gunnison Disposal Site Hydrograph

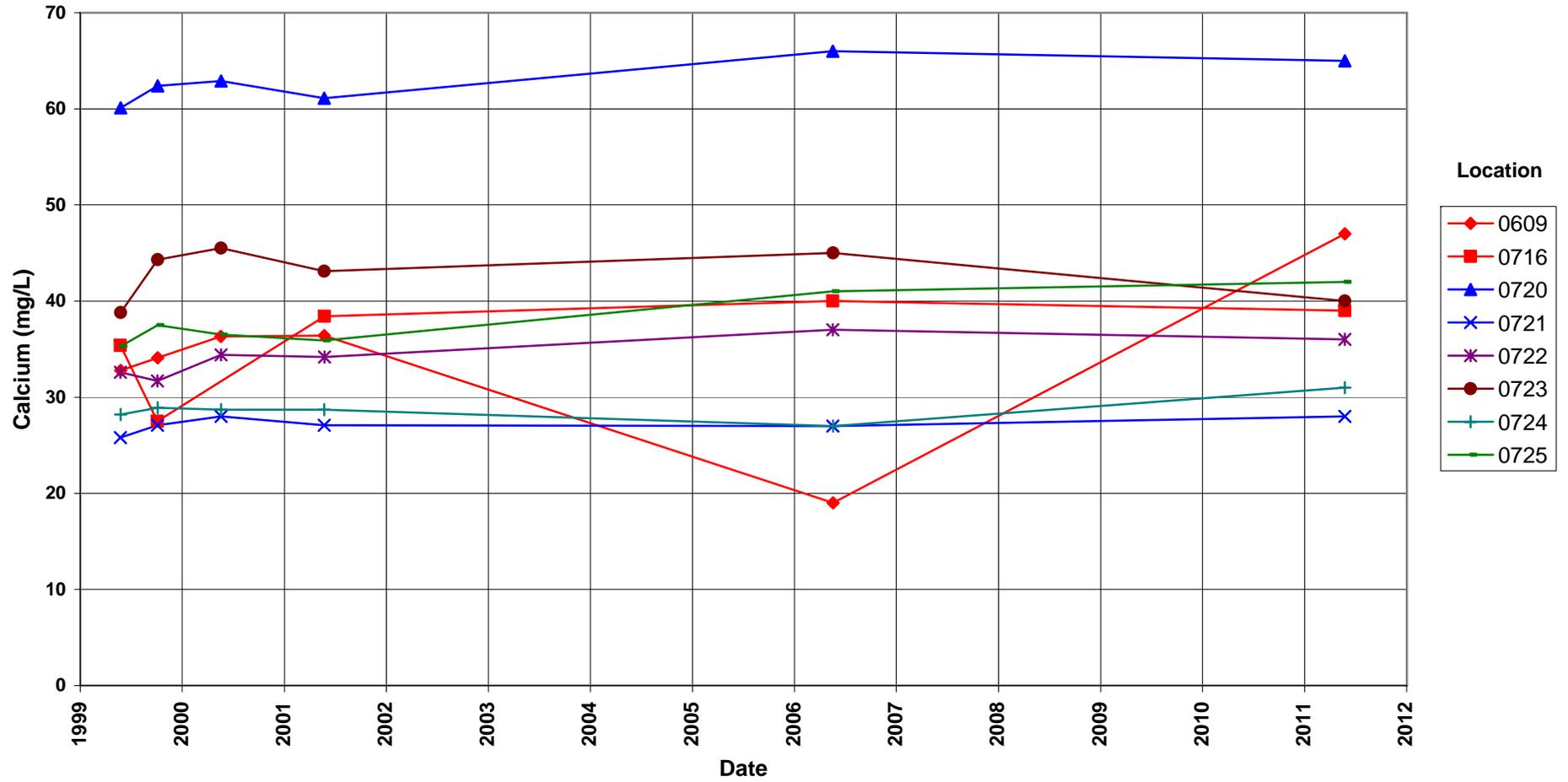


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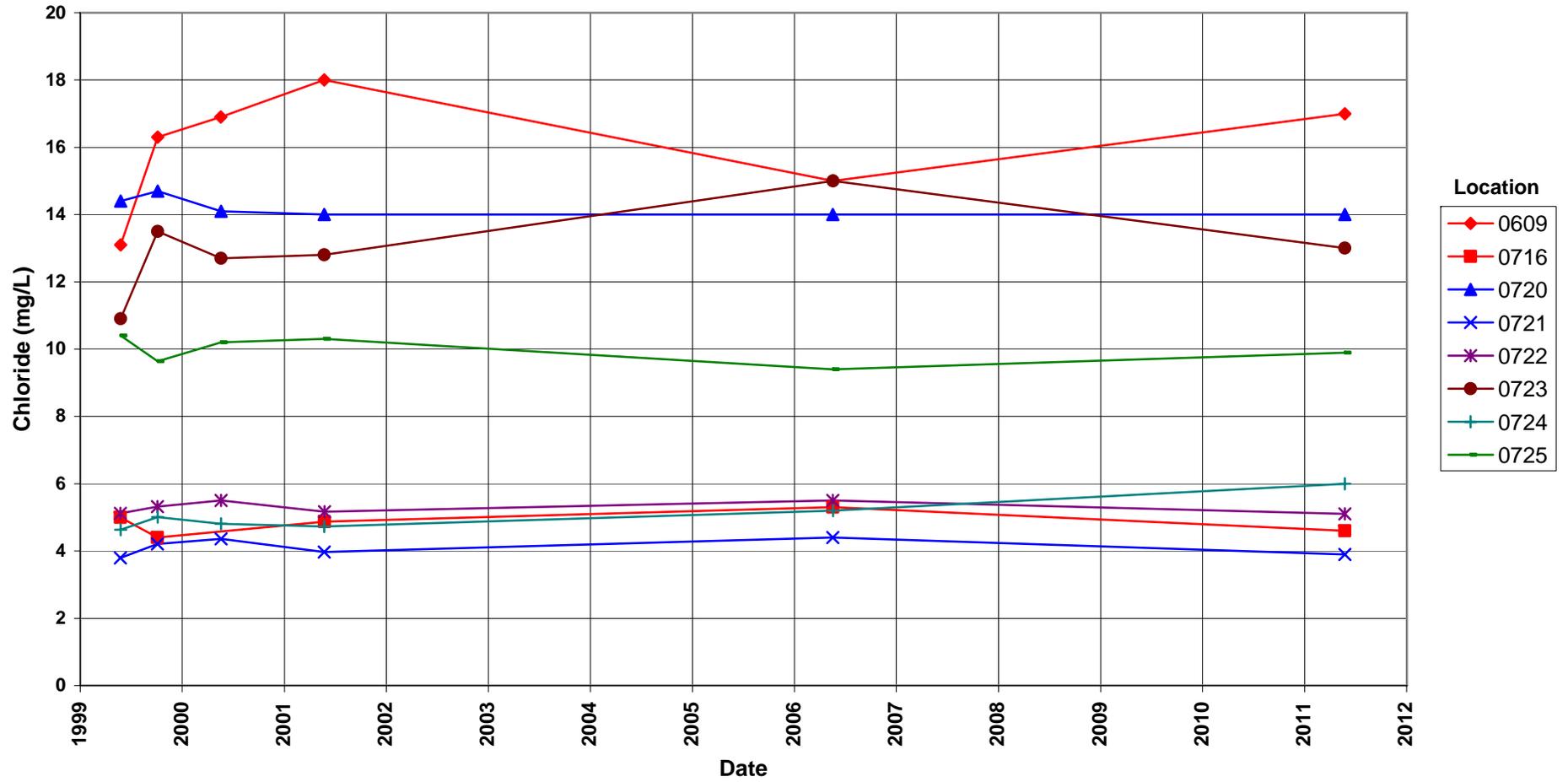
Time-Concentration Graphs

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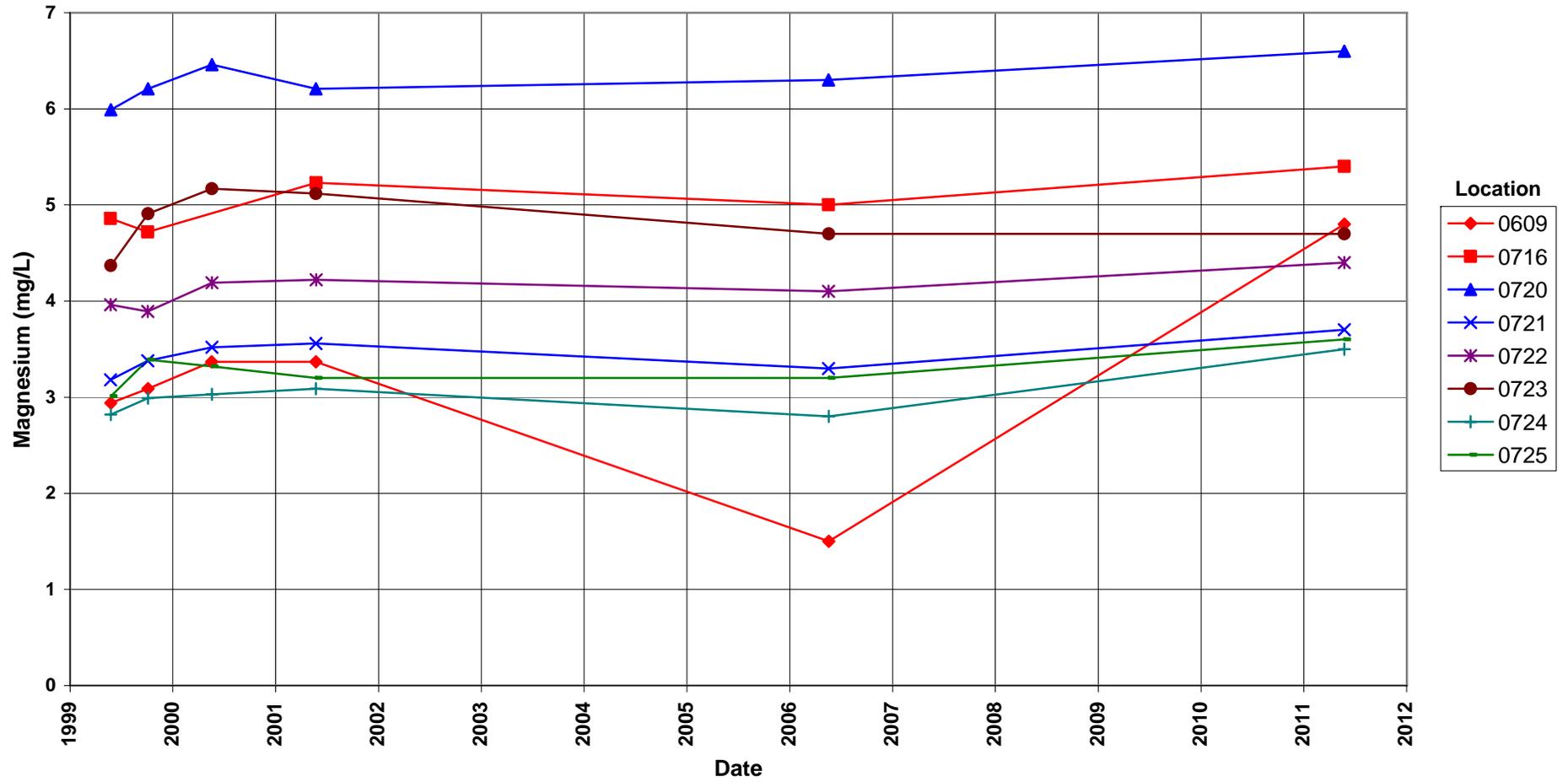
Gunnison Disposal Site Calcium Concentration



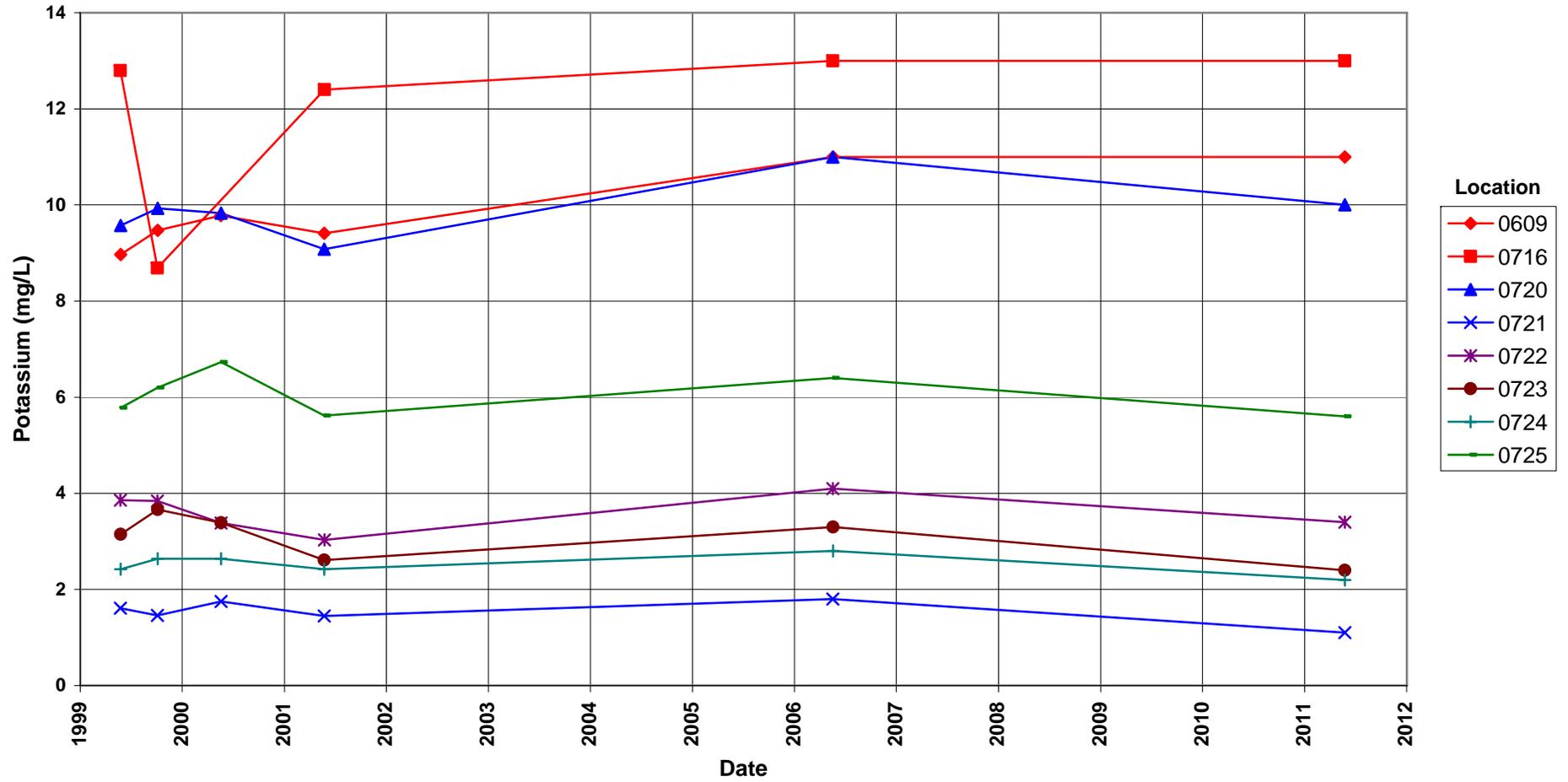
Gunnison Disposal Site Chloride Concentration



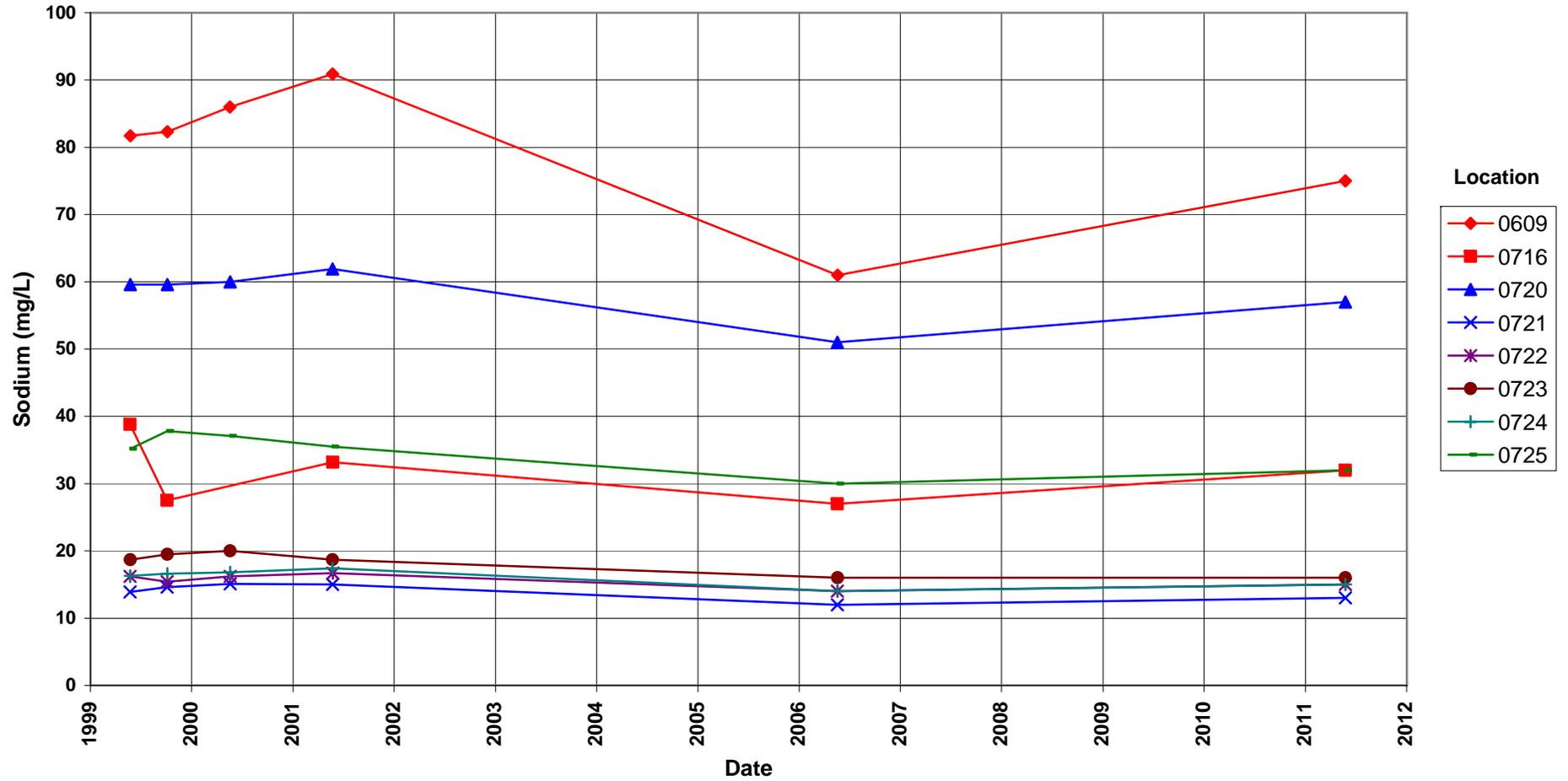
Gunnison Disposal Site Magnesium Concentration



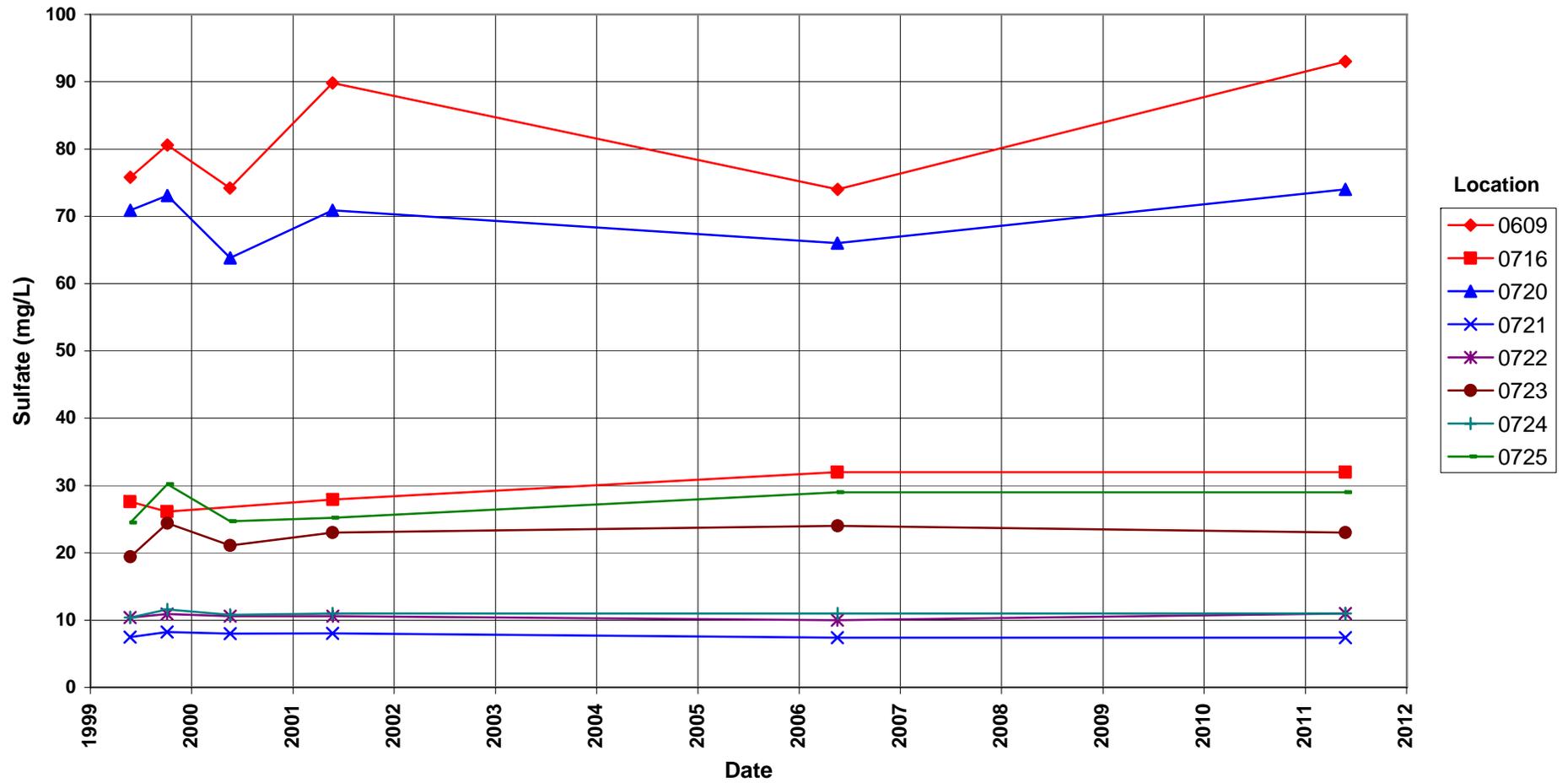
Gunnison Disposal Site Potassium Concentration



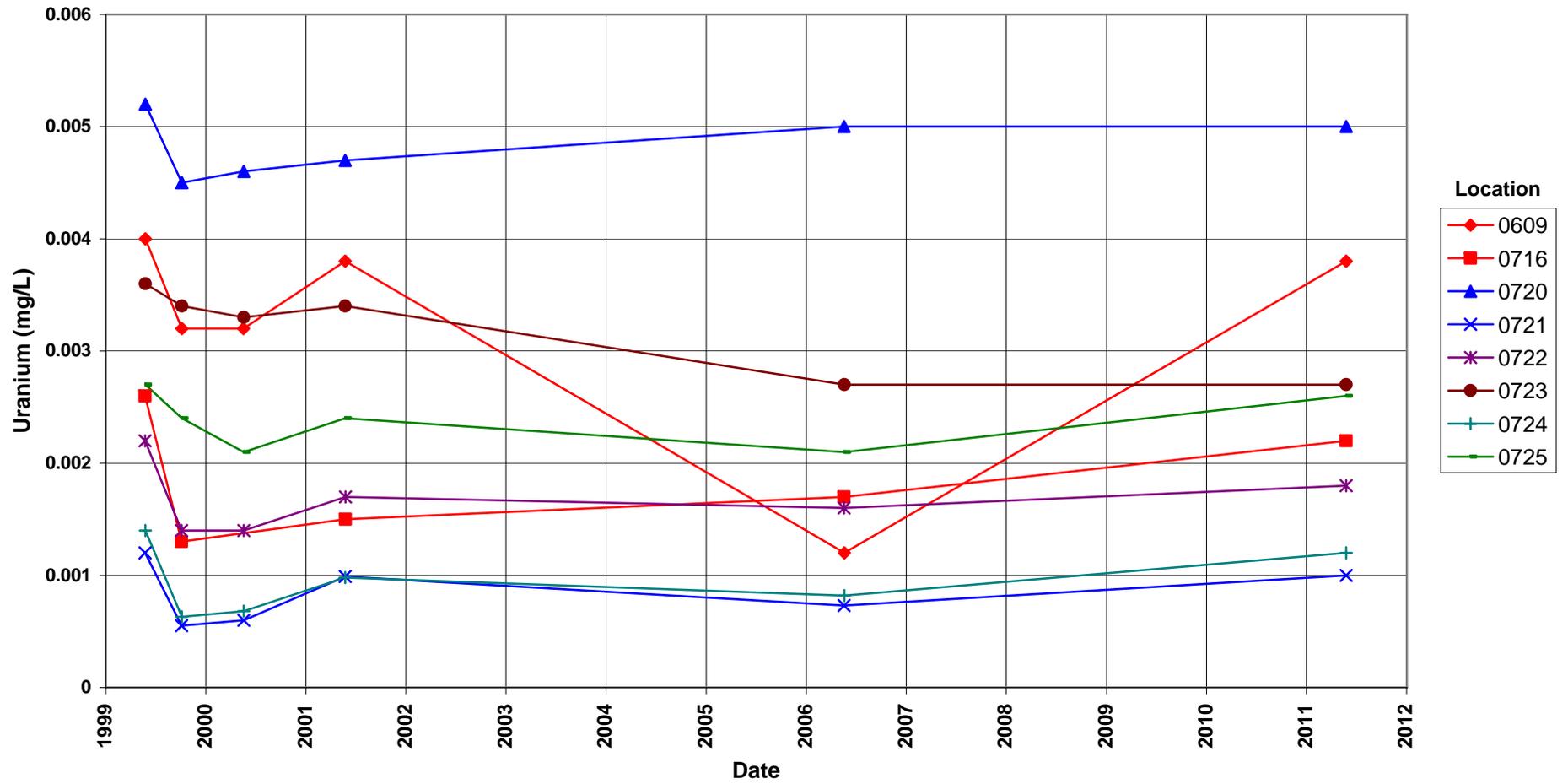
Gunnison Disposal Site Sodium Concentration



Gunnison Disposal Site Sulfate Concentration



Gunnison Disposal Site Uranium Concentration



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Attachment 3
Sampling and Analysis Work Order

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established 1959

Task Order LM-501
Control Number: 11-0564

April 14, 2011

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

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
May 2011 Environmental Sampling at the Gunnison, Colorado, Disposal Site

REFERENCE: Task Order LM00-501-02-108-402, Gunnison, CO, Disposal Site

Dear Mr. Desormeau:

The purpose of this letter is to inform you of the upcoming sampling at Gunnison, CO. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Gunnison, CO, 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 May 23, 2011.

The following list shows the monitoring wells (with zone of completion) scheduled to be sampled during this event.

Disposal Site (GUN08) Monitoring Wells*

609 Gc	720 Tg	721 Tg	722 Tg	723 Tg	724 Tg	725 Tg
716 Gc						

*NOTE: Gc = Clayey gravel; Tg = Tertiary gravels

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.

Please call me at (970) 248-6654 if you have any questions.

Sincerely,

Sam Campbell
Site Lead

Joseph Desormeau
Control Number 11-0564
Page 2

SC/lcg/lb

Enclosures (3)

cc: (electronic)

Cheri Bahrke, Stoller
Sam Campbell, Stoller
Steve Donovan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Michelle Morton, Stoller
EDD Delivery
rc-grand.junction
File: GUN410.02 (A)

Sampling Frequencies for Locations at Gunnison, Colorado

Location ID	Quarterly	Semiannually	Annually	Every 5 years	Not Sampled	Notes
Monitoring Wells						
<i>GUN08</i>						
609				X after 5/15		BKGD; next in 2011
630					X	WLs ONLY; next in 2011
634					X	WLs ONLY; next in 2011
663					X	WLs ONLY; next in 2011
709					X	WLs ONLY; next in 2011
710					X	WLs ONLY; next in 2011
712					X	WLs ONLY; next in 2011
714					X	WLs ONLY; next in 2011
715					X	WLs ONLY; next in 2011
716				X after 5/15		BKGD; next in 2011
720				X after 5/15		POC; next in 2011
721				X after 5/15		POC; next in 2011
722				X after 5/15		POC; next in 2011
723				X after 5/15		POC; next in 2011
724				X after 5/15		POC; next in 2011
725				X after 5/15		POC; next in 2011

GUN08 sampling at the disposal cell must not be conducted before May 15th due to CDOW requirements regarding access to this site during Sage Grouse mating.

Constituent Sampling Breakdown

		Gunnison		
Analyte	Groundwater	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	38			
Field Measurements				
Alkalinity				
Dissolved Oxygen				
Redox Potential	X			
pH	X			
Specific Conductance	X			
Turbidity	X			
Temperature	X			
Laboratory Measurements		GUN08		
Aluminum				
Ammonia as N (NH3-N)				
Calcium	X	5	SW-846 6010	LMM-01
Chloride	X	0.5	SW-846 9056	WCH-A-039
Chromium				
Gross Alpha				
Gross Beta				
Iron	X	0.05	SW-846 6020	LMM-02
Lead				
Magnesium	X	5	SW-846 6010	LMM-01
Manganese	X	0.005	SW-846 6010	LMM-01
Molybdenum				
Nickel				
Nickel-63				
Nitrate + Nitrite as N (NO ₃ +NO ₂)-N				
Potassium	X	1	SW-846 6010	LMM-01
Radium-226				
Radium-228				
Selenium				
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	10			

Note: The total number of analytes does not include field parameters.

Attachment 4

Trip Report

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Memorandum

Control Number N/A

DATE: June 3, 2011
TO: Sam Campbell
FROM: Jeff Price
SUBJECT: Trip Report

Site: Gunnison, Colorado, Disposal Site.

Dates of Sampling Event: May 23-26, 2011

Team Member: Dan Sellers and Jeff Price.

Number of Locations Sampled: Eight wells at the disposal cell; one domestic well (0477) at the processing site.

Locations Not Sampled/Reason: Domestic well 0476 (processing site) was not sampled; the property owners are seasonal residents and have not moved in for the summer.

Location Specific Information: Collected 0476 from kitchen faucet. Wells 0609, 0716, 0720, 0721, 0722, 0723, 0724, and 0725 were re-developed prior to sampling.

Field Variance: None.

Quality Control Sample Cross Reference: The following is the false identification assigned to the quality control sample:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2158	0720	Duplicate	Groundwater	JGR 407

Requisition Numbers Assigned: Samples were assigned to requisition identification numbers (RIN) 11053801 (disposal cell) and 11053820 (processing site). Samples were shipped on May 26, 2011, to ALS Laboratory.

Water Level Measurements: Site wide water levels were collected at the disposal site.

Well Inspection Summary: All wells are in satisfactory condition; surface protective casings were painted and labeled.

Equipment: All equipment functioned properly.

Regulatory: None.

Institutional Controls

Fences, Gates, Locks: Ok; graphite lubricant was applied to all locks.

Signs: Ok.

Trespassing/Site Disturbances: None.

Site Issues: None.

Disposal Cell/Drainage Structure Integrity: Ok.

Vegetation/Noxious Weed Concerns: None.

Maintenance Requirements: None.

Site Issues: None.

Access Issues: None.

Corrective Action Required/Taken: None.

(JEP/lcg)

cc: (electronic)
Joe Desormeau, DOE
Steve Donovan, Stoller
Bev Gallagher, Stoller
EDD Delivery

Attachment 5
Sample Collection Forms

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Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0609 Category: I
 Arrival Time 14:25 RIN # 11053801 TICKET # JGR 399
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 105.14 Casing Diameter (in): 2-inch Depth of Well (ft): 150 One Pump/Tubing Volume (L): 1.78

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight ()
 Dedicated Bladder Pump (X) Dedicated Poly Tubing (X) Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Purge Data Purge Start: 05/25/2011 14:26 Purge Stop: 05/25/2011 15:05
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
14:35	2.2	105.5	10.24	577		8.07	42.5	9.92
14:38	3	105.5	10.14	572		8.08	42.8	8.95
14:41	3.8	105.5	10.07	573		8.06	43.3	39.8
14:44	4.6	105.5	10.14	600		7.66	45.2	30.8
14:54	7.2	105.5	10.13	601		7.66	45.2	30.6
15:00	8.7	105.5	9.98	600		7.65	45.3	11.1
15:05	10	105.5	10.29	606		7.67	45.4	6.90

Flow Rate (ml/min): 256

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 15:10 Storage: Ice in cooler? (Yes)

Weather [Precipitation : clear], [Wind : light], [Temperature (°F) : 60 to 70]

Date Signed 5/26/2011 Sampler(s) Dan Sellers, Jeff Price

Comments: Develop well on 5/24; surge w/air, purge 20 gallons w/2" grundfos pump, not very turbid, some bio-slime build-up on pump.

Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0716 Category: I
 Arrival Time 10:25 RIN # 11053801 TICKET # JGR 400
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 179.75 Casing Diameter (in): 4-inch Depth of Well (ft): 229 One Pump/Tubing Volume (L): 2.58

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight ()
 Dedicated Bladder Pump (X) Dedicated Poly Tubing (X) Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Purge Data Purge Start: 05/25/2011 10:28 Purge Stop: 05/25/2011 10:52
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
10:40	2.75	185.39	11.60	408		7.66	106.3	9.46
10:47	3.75	184.7	11.41	408		7.66	105.5	7.14
10:52	4.5	184.7	10.74	407		7.66	105.3	6.94

Flow Rate (ml/min): 188

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 10:55 Storage: Ice in cooler? (Yes)

Weather [Precipitation : clear], [Temperature (°F) : 50 to 60]

Date Signed 5/26/2011 Sampler(s) Dan Sellers, Jeff Price

Comments: Develop well on 5/25; surge w/air, purge 15 with 2" Grundfos pump, turbidity > 100, purge 3 gallons w/dedicated bladder pump; minor amount of bio-film on pump.

Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0720 Category: I
 Arrival Time 15:53 RIN # 11053801 TICKET # JGR 401
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 118.34 Casing Diameter (in): 4-inch Depth of Well (ft): 140.50 One Pump/Tubing Volume (L): 1.68

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight ()
 Dedicated Bladder Pump (X) Dedicated Poly Tubing (X) Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Sample Type	False ID/Location	Ticket #	Filtered	Sample Time
Duplicate	2158	JGR 407	No	15:50

Purge Data Purge Start: 05/25/2011 15:55 Purge Stop: 05/25/2011 16:08
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
16:02	2	118.8	10.46	588		7.45	64.3	4.26
16:05	2.75	118.8	10.37	591		7.45	64.8	4.77
16:08	3.5	118.8	10.32	592		7.45	65.0	5.12

Flow Rate (ml/min): 269

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 16:10 Storage: Ice in cooler? (Yes)

Weather [Precipitation : clear], [Wind : light], [Temperature (°F) : 60 to 70]

Date Signed 5/26/2011 Sampler(s) Dan Sellers, Jeff Price

Comments: Develop well on 5/24; surge w/air, purge 25 gallons w/2" Grundfos pump, turbidity > 100; minor amount of bio-slime on pump.

Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0721 Category: I
 Arrival Time 15:21 RIN # 11053801 TICKET # JGR 402
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 138.4 Casing Diameter (in): 4-inch Depth of Well (ft): 162 One Pump/Tubing Volume (L): 1.89

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight ()
 Dedicated Bladder Pump (X) Dedicated Poly Tubing (X) Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Purge Data Purge Start: 05/25/2011 15:23 Purge Stop: 05/25/2011 15:38
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
15:32	2.2	139.1	10.41	227		7.35	17.4	0.93
15:35	3	139.05	10.43	227		7.35	18.7	1.32
15:38	3.8	139.05	10.34	227		7.35	20.3	1.72

Flow Rate (ml/min): 253

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 15:40 Storage: Ice in cooler? (Yes)

Weather [Precipitation : clear], [Wind : light], [Temperature (°F) : 60 to 70]

Date Signed 5/26/2011 Sampler(s) Dan Sellers, Jeff Price

Comments: Developed well on 5/24/2011: Start @1700 using grunfos. Surged 5 times before purging 60 gal @3.0 liters/min. Finished @1830. NTU <10.

Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0722 Category: I
 Arrival Time 08:58 RIN # 11053801 TICKET # JGR 403
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 147.05 Casing Diameter (in): 4-inch Depth of Well (ft): 172 One Pump/Tubing Volume (L): 2.04

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight ()
 Dedicated Bladder Pump (X) Dedicated Poly Tubing (X) Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Purge Data Purge Start: 05/25/2011 09:01 Purge Stop: 05/25/2011 09:23
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
09:13	2.5	147.65	10.59	317		7.38	77.8	9.7
09:18	3.5	147.65	10.07	307		7.38	75.7	8.9
09:23	4.5	147.65	9.64	306		7.40	74.5	8.8

Flow Rate (ml/min): 205

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 09:25 Storage: Ice in cooler? (Yes)

Weather [Precipitation : clear], [Wind : light], [Temperature (°F) : 40 to 50]

Date Signed 5/26/2011 Sampler(s) Jeff Price, Dan Sellers

Comments: Develope well on 5/24; surge w/air, purge 30 gallons with 2" Grundfos, tubidty > 100; no bio-slime on pump.

Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0723 Category: I
 Arrival Time 09:43 RIN # 11053801 TICKET # JGR 404
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 136.61 Casing Diameter (in): 4-inch Depth of Well (ft): 162 One Pump/Tubing Volume (L): 1.92

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight (X)
 Dedicated Bladder Pump (X) Dedicated Poly Tubing () Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Purge Data Purge Start: 05/25/2011 09:46 Purge Stop: 05/25/2011 10:04
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
09:54	2.0	137.33	9.86	345		7.53	70.4	8.52
09:59	3	137.33	10.41	343		7.53	70.8	6.67
10:04	4	137.33	10.54	343		7.53	71.5	4.31

Flow Rate (ml/min): 222

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 10:05 Storage: Ice in cooler? (Yes)

Weather [Precipitation : clear], [Wind : light], [Temperature (°F) : 50 to 60]

Date Signed 5/26/2011 Sampler(s) Dan Sellers, Jeff Price

Comments: Developed well on 5/24/2011. Start time 1230. Stop time 1620. Air surge for 20 min then started pumping with Grunfos - pumped 3 liters before purging stopped due to insufficient water and pump rate to fast (2.5 L/min) . Finished with bladder pump - purged 13 gallons.

Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0724 Category: I
 Arrival Time 11:17 RIN # 11053801 TICKET # JGR 405
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 127.79 Casing Diameter (in): 4-inch Depth of Well (ft): 142 One Pump/Tubing Volume (L): 1.70

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight ()
 Dedicated Bladder Pump (X) Dedicated Poly Tubing (X) Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Purge Data Purge Start: 05/25/2011 11:19 Purge Stop: 05/25/2011 11:36
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
11:31	2.5	128.5	10.74	268		7.32	79.7	3.66
11:33	3	128.5	10.52	268		7.32	80.3	2.64
11:36	3.75	128.5	10.67	267		7.32	80.7	2.37

Flow Rate (ml/min): 221

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 11:40 Storage: Ice in cooler? (Yes)

Weather [Precipitation : overcast], [Wind : windy], [Temperature (°F) : 50 to 60]

Date Signed 5/26/2011 Sampler(s) Dan Sellers, Jeff Price

Comments: Develop well on 5/24; surge w/air, purge 35 gallons w/2" Grundfos pump, turb. > 200; no bio-slime on pump.

Water Sampling Field Data

Date 5/25/2011 Project Location GUN08 Well/Location No. 0725 Category: I
 Arrival Time 13:41 RIN # 11053801 TICKET # JGR 406
 Well Purging Information Well Condition: Acceptable (X) See Comments: (X)
 Water Level (ft): 116.33 Casing Diameter (in): 4-inch Depth of Well (ft): 144.50 One Pump/Tubing Volume (L): 1.73

Sampling Equipment

Peristaltic Pump () Portable Bladder Pump () Portable Submersible Pump () Tubing Reel with weight ()
 Dedicated Bladder Pump (X) Dedicated Poly Tubing (X) Dedicated Submersible Pump () Container Immersion ()
 Bailer () Tap () Other ()

Measurement Equipment Operational Check Time 08:13

Equipment Type	Manufacturer	Model #	Property #	Serial #
Turbidimeter	Hach	s-16916	s-16916	
Measurement Equipment	YSI	6920	Sonde "A"	

Purge Data Purge Start: 05/25/2011 13:45 Purge Stop: 05/25/2011 14:00
 Measured From: Open Container () Air Exclusion (X) In-situ ()

Time	Total Volume Purged (L)	Water Level (ft)	Temp. (°C)	Spec Cond. (µS/cm)	DO (mg/L)	pH (s.u.)	ORP (mV)	Turbidity (NTU)
13:53	2.2	117.2	11.08	383		7.56	27.4	6.2
13:56	3	117.2	11.08	384		7.56	27.5	8.77
14:00	4	117.2	10.96	384		7.57	28.1	5.07

Flow Rate (ml/min): 267

Filtration Number of filters used: 0 Pore Size: N/A

Sample Time: 05/25/2011 14:05 Storage: Ice in cooler? (Yes)

Weather [Precipitation : clear], [Wind : none], [Temperature (°F) : 60 to 70]

Date Signed 5/26/2011 Sampler(s) Dan Sellers, Jeff Price

Comments: Developed well: Start @1430 using grunfos. Surged 5 times before purging 15 gal @.75 liters/min. Finished @1630.

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Attachment 6
Laboratory Results Forms

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1105427
Client Name: Stoller-Grand Junction Team
ClientProject ID: Gunnison RIN# 11053801

Field ID: 0609
Lab ID: 1105427-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

Analysis ReqCode: MET-A-020

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	47000	1000	12		
7439-89-6	IRON	1	5.6	100	4.9	B	
7439-95-4	MAGNESIUM	1	4800	1000	13		E
7439-96-5	MANGANESE	1	6.8	5	0.11		E
7440-09-7	POTASSIUM	1	11000	1000	110		E
7440-23-5	SODIUM	1	75000	1000	6.6		

Data Package ID: IT1105427-1

Date Printed: Thursday, June 23, 2011

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1105427
Client Name: Stoller-Grand Junction Team
ClientProject ID: Gunnison RIN# 11053801

Field ID: 0716
Lab ID: 1105427-2

Analysis ReqCode: MET-A-020

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	39000	1000	12		
7439-89-6	IRON	1	770	100	4.9		
7439-95-4	MAGNESIUM	1	5400	1000	13		
7439-96-5	MANGANESE	1	600	5	0.11		
7440-09-7	POTASSIUM	1	13000	1000	110		
7440-23-5	SODIUM	1	32000	1000	6.6		

Data Package ID: IT1105427-1

Date Printed: Thursday, June 23, 2011

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1105427
Client Name: Stoller-Grand Junction Team
ClientProject ID: Gunnison RIN# 11053801

Field ID: 0720
Lab ID: 1105427-3

Analysis ReqCode: MET-A-020

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	65000	1000	12		
7439-89-6	IRON	1	41	100	4.9	B	
7439-95-4	MAGNESIUM	1	6600	1000	13		
7439-96-5	MANGANESE	1	24	5	0.11		
7440-09-7	POTASSIUM	1	10000	1000	110		
7440-23-5	SODIUM	1	57000	1000	6.6		

Data Package ID: IT1105427-1

Date Printed: Thursday, June 23, 2011

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
 Work Order Number: 1105427
 Client Name: Stoller-Grand Junction Team
 ClientProject ID: Gunnison RIN# 11053801

Field ID: 0721
Lab ID: 1105427-4

Sample Matrix: WATER
 % Moisture: N/A
 Date Collected: 25-May-11
 Date Extracted: 14-Jun-11
 Date Analyzed: 15-Jun-11
 Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
 QC Batch ID: IP110614-3-1
 Run ID: IT110615-2A2
 Cleanup: NONE
 Basis: As Received
 File Name: 110615A.

Sample Aliquot: 50 g
 Final Volume: 50 g
 Result Units: UG/L
 Clean DF: 1

Analysis ReqCode: MET-A-020

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	28000	1000	12		
7439-89-6	IRON	1	59	100	4.9	B	
7439-95-4	MAGNESIUM	1	3700	1000	13		
7439-96-5	MANGANESE	1	1.1	5	0.11	B	
7440-09-7	POTASSIUM	1	1100	1000	110		
7440-23-5	SODIUM	1	13000	1000	6.6		

Data Package ID: IT1105427-1

Date Printed: Thursday, June 23, 2011

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LIMS Version: 6.497

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1105427
Client Name: Stoller-Grand Junction Team
ClientProject ID: Gunnison RIN# 11053801

Field ID: 0722
Lab ID: 1105427-5

Analysis ReqCode: MET-A-020

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	36000	1000	12		
7439-89-6	IRON	1	330	100	4.9		
7439-95-4	MAGNESIUM	1	4400	1000	13		
7439-96-5	MANGANESE	1	16	5	0.11		
7440-09-7	POTASSIUM	1	3400	1000	110		
7440-23-5	SODIUM	1	15000	1000	6.6		

Data Package ID: IT1105427-1

Date Printed: Thursday, June 23, 2011

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1105427
Client Name: Stoller-Grand Junction Team
ClientProject ID: Gunnison RIN# 11053801

Field ID: 0723
Lab ID: 1105427-6

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

Analysis ReqCode: MET-A-020

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	40000	1000	12		
7439-89-6	IRON	1	40	100	4.9	B	
7439-95-4	MAGNESIUM	1	4700	1000	13		
7439-96-5	MANGANESE	1	4.2	5	0.11	B	
7440-09-7	POTASSIUM	1	2400	1000	110		
7440-23-5	SODIUM	1	16000	1000	6.6		

Data Package ID: IT1105427-1

Date Printed: Thursday, June 23, 2011

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1105427
Client Name: Stoller-Grand Junction Team
ClientProject ID: Gunnison RIN# 11053801

Field ID: 0724
Lab ID: 1105427-7

Analysis ReqCode: MET-A-020

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	31000	1000	12		
7439-89-6	IRON	1	98	100	4.9	B	
7439-95-4	MAGNESIUM	1	3500	1000	13		
7439-96-5	MANGANESE	1	14	5	0.11		
7440-09-7	POTASSIUM	1	2200	1000	110		
7440-23-5	SODIUM	1	15000	1000	6.6		

Data Package ID: IT1105427-1

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Total Recoverable ICP Metals

Method SW6010B

Sample Results

Lab Name: ALS Environmental -- FC

Work Order Number: 1105427

Client Name: Stoller-Grand Junction Team

ClientProject ID: Gunnison RIN# 11053801

Field ID: 0725
Lab ID: 1105427-8

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

Analysis ReqCode: MET-A-020

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	42000	1000	12		
7439-89-6	IRON	1	63	100	4.9	B	
7439-95-4	MAGNESIUM	1	3600	1000	13		
7439-96-5	MANGANESE	1	61	5	0.11		
7440-09-7	POTASSIUM	1	5600	1000	110		
7440-23-5	SODIUM	1	32000	1000	6.6		

Data Package ID: IT1105427-1

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Total Recoverable ICP Metals

Method SW6010B Sample Results

Lab Name: ALS Environmental -- FC
Work Order Number: 1105427
Client Name: Stoller-Grand Junction Team
ClientProject ID: Gunnison RIN# 11053801

Field ID: 2158
Lab ID: 1105427-9

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 25-May-11
Date Extracted: 14-Jun-11
Date Analyzed: 15-Jun-11
Prep Method: SW3005 Rev A

Prep Batch: IP110614-3
QC Batch ID: IP110614-3-1
Run ID: IT110615-2A2
Cleanup: NONE
Basis: As Received
File Name: 110615A.

Sample Aliquot: 50 g
Final Volume: 50 g
Result Units: UG/L
Clean DF: 1

Analysis ReqCode: MET-A-020

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	IDL	Result Qualifier	EPA Qualifier
7440-70-2	CALCIUM	1	64000	1000	12		
7439-89-6	IRON	1	14	100	4.9	B	
7439-95-4	MAGNESIUM	1	6500	1000	13		
7439-96-5	MANGANESE	1	22	5	0.11		
7440-09-7	POTASSIUM	1	10000	1000	110		
7440-23-5	SODIUM	1	56000	1000	6.6		

Data Package ID: IT1105427-1

Date Printed: Thursday, June 23, 2011

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Total Recoverable URANIUM

Method SW6020A

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: Stoller-Grand Junction Team
Client Project ID: Gunnison RIN# 11053801
Work Order Number: 1105427
Reporting Basis: As Received

Final Volume: 50 g
Matrix: WATER
Result Units: ug/l

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	IDL	Flag	Sample Aliquot
0609	1105427-1	5/25/2011	6/14/2011	06/16/2011	N/A	10	3.8	0.1	0.029		50 g
0716	1105427-2	5/25/2011	6/14/2011	06/16/2011	N/A	10	2.2	0.1	0.029		50 g
0720	1105427-3	5/25/2011	6/14/2011	06/16/2011	N/A	10	5	0.1	0.029		50 g
0721	1105427-4	5/25/2011	6/14/2011	06/16/2011	N/A	10	1	0.1	0.029		50 g
0722	1105427-5	5/25/2011	6/14/2011	06/16/2011	N/A	10	1.8	0.1	0.029		50 g
0723	1105427-6	5/25/2011	6/14/2011	06/16/2011	N/A	10	2.7	0.1	0.029		50 g
0724	1105427-7	5/25/2011	6/14/2011	06/16/2011	N/A	10	1.2	0.1	0.029		50 g
0725	1105427-8	5/25/2011	6/14/2011	06/16/2011	N/A	10	2.6	0.1	0.029		50 g
2158	1105427-9	5/25/2011	6/14/2011	06/16/2011	N/A	10	5	0.1	0.029		50 g

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

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CHLORIDE
Method SW9056
Sample Results

Lab Name: ALS Environmental -- FC
 Client Name: Stoller-Grand Junction Team
 Client Project ID: Gunnison RIN# 11053801
 Work Order Number: 1105427
 Reporting Basis: As Received
 Prep Method: NONE

Final Volume: 5 ml
 Matrix: WATER
 Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
0609	1105427-1	05/25/2011	06/07/2011	06/07/2011	N/A	1	17	0.2		5 ml
0716	1105427-2	05/25/2011	06/07/2011	06/07/2011	N/A	1	4.6	0.2		5 ml
0720	1105427-3	05/25/2011	06/07/2011	06/07/2011	N/A	1	13	0.2		5 ml
0721	1105427-4	05/25/2011	06/07/2011	06/07/2011	N/A	1	3.9	0.2		5 ml
0722	1105427-5	05/25/2011	06/07/2011	06/07/2011	N/A	1	5.1	0.2		5 ml
0723	1105427-6	05/25/2011	06/07/2011	06/07/2011	N/A	1	13	0.2		5 ml
0724	1105427-7	05/25/2011	06/07/2011	06/07/2011	N/A	1	6	0.2		5 ml
0725	1105427-8	05/25/2011	06/07/2011	06/07/2011	N/A	1	9.9	0.2		5 ml
2158	1105427-9	05/25/2011	06/07/2011	06/07/2011	N/A	1	14	0.2		5 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ic1105427-1*

Date Printed: Wednesday, June 15, 2011

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SULFATE
Method SW9056
Sample Results

Lab Name: ALS Environmental -- FC
 Client Name: Stoller-Grand Junction Team
 Client Project ID: Gunnison RIN# 11053801
 Work Order Number: 1105427
 Reporting Basis: As Received
 Prep Method: NONE

Final Volume: 5 ml
 Matrix: WATER
 Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
0609	1105427-1	05/25/2011	06/07/2011	06/07/2011	N/A	1	93	0.5		5 ml
0716	1105427-2	05/25/2011	06/07/2011	06/07/2011	N/A	1	32	0.5		5 ml
0720	1105427-3	05/25/2011	06/07/2011	06/07/2011	N/A	1	74	0.5		5 ml
0721	1105427-4	05/25/2011	06/07/2011	06/07/2011	N/A	1	7.4	0.5		5 ml
0722	1105427-5	05/25/2011	06/07/2011	06/07/2011	N/A	1	11	0.5		5 ml
0723	1105427-6	05/25/2011	06/07/2011	06/07/2011	N/A	1	23	0.5		5 ml
0724	1105427-7	05/25/2011	06/07/2011	06/07/2011	N/A	1	11	0.5		5 ml
0725	1105427-8	05/25/2011	06/07/2011	06/07/2011	N/A	1	29	0.5		5 ml
2158	1105427-9	05/25/2011	06/07/2011	06/07/2011	N/A	1	74	0.5		5 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *ic1105427-1*

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TOTAL DISSOLVED SOLIDS

Method EPA160.1

Sample Results

Lab Name: ALS Environmental -- FC
Client Name: Stoller-Grand Junction Team
Client Project ID: Gunnison RIN# 11053801
Work Order Number: 1105427
Reporting Basis: As Received
Prep Method: METHOD

Final Volume: 100 ml
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
0609	1105427-1	05/25/2011	06/01/2011	06/02/2011	N/A	1	390	20		100 ml
0716	1105427-2	05/25/2011	06/01/2011	06/02/2011	N/A	1	260	20		100 ml
0720	1105427-3	05/25/2011	06/01/2011	06/02/2011	N/A	1	390	20		100 ml
0721	1105427-4	05/25/2011	06/01/2011	06/02/2011	N/A	1	170	20		100 ml
0722	1105427-5	05/25/2011	06/01/2011	06/02/2011	N/A	1	200	20		100 ml
0723	1105427-6	05/25/2011	06/01/2011	06/02/2011	N/A	1	220	20		100 ml
0724	1105427-7	05/25/2011	06/01/2011	06/02/2011	N/A	1	170	20		100 ml
0725	1105427-8	05/25/2011	06/01/2011	06/02/2011	N/A	1	250	20		100 ml
2158	1105427-9	05/25/2011	06/01/2011	06/02/2011	N/A	1	390	20		100 ml

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *td1105427-1*

Date Printed: Wednesday, June 15, 2011

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