Data Validation Package

May 2013 Groundwater and Surface Water Sampling at the Rio Blanco, Colorado Site

October 2013

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Rio Blanco, Colorado, Site

Sampling Period: May 14–16, 2013

Annual sampling was conducted at the Rio Blanco, Colorado, site for the Long-Term Hydrologic Monitoring Program May 14–16, 2013, to monitor groundwater and surface water for potential radionuclide contamination. Sampling and analyses were conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites.* (LMS/PRO/S04351, continually updated). A duplicate sample was collected from location CER #1 Black Sulphur. Samples were analyzed for gamma-emitting radionuclides by high-resolution gamma spectrometry and for tritium using the conventional and enrichment methods.

All high-resolution gamma spectrometry results and all tritium results were below detectable concentrations. The results from this sampling event indicate that groundwater and surface water supplies in the area have not been impacted by detonation-related contaminants. Results of this monitoring at the Rio Blanco site demonstrate that groundwater and surface water outside the site boundaries have not been affected by project-related contaminants.

Rick Hutton
Site Lead, S.M. Stoller Corporation

10-24-13
Date

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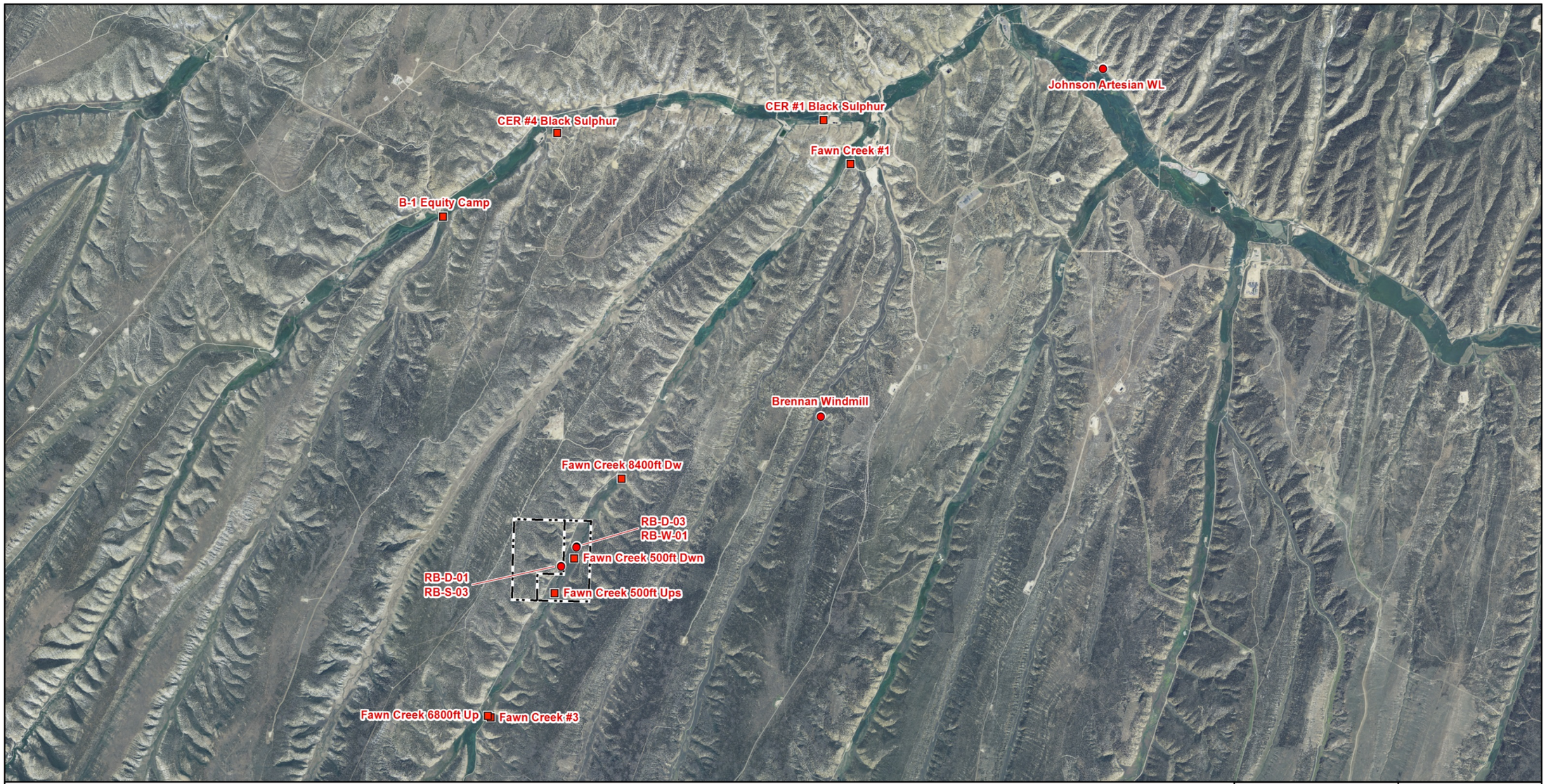

Rio Blanco, Colorado, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Rio Blanco, Colorado	**Date(s) of Water Sampling**	May 14–16, 2013
Date(s) of Verification	October 11, 2013	**Name of Verifier**	Stephen Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List any Program Directives or other documents, SOPs, instructions.		Work Order letter dated April 18, 2013.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Were calibrations conducted as specified in the above-named documents?	Yes	Calibrations were performed May 10, 2013.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Were wells categorized correctly?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected at location CER #1 Black Sulphur.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One equipment blank was collected.
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?	NA	Sample chilling was not required.
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	13055301
Sample Event:	May 14–17, 2013
Site(s):	Rio Blanco, Colorado, Site
Laboratory:	GEL Laboratories, Charleston, South Carolina
Work Order No.:	326194
Analysis:	Radiochemistry
Validator:	Stephen Donivan
Review Date:	October 10, 2013

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 1.

Table 1. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Gamma Spectrometry	GAM-A-001	EPA 901.1	EPA 901.1
Tritium	LSC-A-001	EPA 906.0m	EPA 906.0m
Tritium, Enrichment Method	LMR-17	DOE EML HASL 300	DOE EML HASL 300

Data Qualifier Summary

Analytical results were qualified as listed in Table 2. Refer to the attached validation worksheets and the sections below for an explanation of the data qualifiers applied.

Table 2. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
326194015	RB-D-01	Potassium-40	U	Less than the decision level concentration

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received 17 water samples on May 22, 2013, accompanied by a Chain of Custody form. The Chain of Custody was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody had no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact at ambient temperature, which complies with requirements. All samples were analyzed within the applicable holding times. All samples were received in the correct container types and had been preserved correctly for the requested analyses with one exception. The gamma bottle for sample RB-D-01 was received with a pH value of 8. The laboratory adjusted the pH of the sample to a value below 2 and allowed the sample to equilibrate prior to analysis.

Detection and Quantitation Limits

Radiochemical results are evaluated using the minimum detectable concentration (MDC), Decision Level Concentration (DLC), and Determination Limit (DL). The MDC is a measure of radiochemical method performance and was calculated and reported as specified in *Quality Systems for Analytical Services*. The DLC 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, and is estimated as 3 times the one-sigma total propagated uncertainty. Results that are greater than the MDC, but less than the DLC are qualified with a "U" flag (not detected). The DL for radiochemical results is the lowest concentration that can be reliably measured, and is defined as 3 times the MDC. Results not previously "U" qualified that are less than the DL are qualified with a "J" flag as estimated values.

The reported MDCs for radiochemical 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. 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.

Radiochemical Analysis

Tritium by Distillation
Instrument quench calibration curves were generated on August 1, 2012. Daily instrument checks performed on July 9, 2013, met the acceptance criteria.

Enriched Tritium
Instrument quench calibration curves were generated on August 1, 2013. Daily instrument checks performed on August 29 and September 2, 2013, met the acceptance criteria. The chemical recoveries were acceptable for all samples.

Gamma Spectrometry
The gamma spectrometry efficiency calibrations were performed within a year prior to sample analysis. All daily calibration and background check results met the acceptance criteria.

Method Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. All method blank results associated with the samples were below the DLC for all analytes.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate samples were analyzed for tritium as a measure of method performance in the sample matrix. All spike results were within the acceptance range.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative error ratio for radiochemical replicate results (calculated using the one-sigma total propagated uncertainty) was less than three, indicating acceptable precision.

Laboratory Control Sample

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

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 September 11, 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 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: 13055301 **Lab Code:** GEN **Validator:** Stephen Donivan **Validation Date:** 10/10/2013

Project: Rio Blanco Site **Analysis Type:** ☐ Metals ☐ General Chem ☑ Rad ☐ Organics

# of Samples: 17 **Matrix:** Water **Requested Analysis Completed:** Yes

Chain of Custody

Present: OK **Signed:** OK **Dated:** OK

Sample

Integrity: OK **Preservation:** OK **Temperature:** OK

Select Quality Parameters

☑ Holding Times	All analyses were completed within the applicable holding times.
☑ Detection Limits	The reported detection limits are equal to or below contract requirements.
☑ Field/Trip Blanks	There was 1 trip/equipment blank evaluated.
☑ Field Duplicates	There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 13055301 **Lab Code:** GEN **Date Due:** 08/19/2013

Matrix: Water **Site Code:** RBL01 **Date Completed:** 09/09/2013

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
2489	Actinium-228	07/05/2013						0.56
2489	Americium-241	07/05/2013						1.76
Blank_Spike	Americium-241	07/05/2013				109.00		
2489	Antimony-125	07/05/2013						0.38
2489	Cerium-144	07/05/2013						0.77
Blank_Spike	Cerium-144	07/05/2013						
2489	Cesium-134	07/05/2013						1.74
2489	Cesium-137	07/05/2013						0.40
Blank_Spike	Cesium-137	07/05/2013				100.00		
2489	Cobalt-60	07/05/2013						0.44
Blank_Spike	Cobalt-60	07/05/2013				99.10		
2489	Europium-152	07/05/2013						1.43
2489	Europium-154	07/05/2013						0.65
Blank_Spike	Europium-154	07/05/2013						
2489	Europium-155	07/05/2013						1.15
2489	Lead-212	07/05/2013						0.70
Blank_Spike	Lead-212	07/05/2013						
2489	Potassium-40	07/05/2013						0.15
2489	Promethium-144	07/05/2013						0.14
Blank_Spike	Promethium-144	07/05/2013						
2489	Promethium-146	07/05/2013						0.28
2489	Ruthenium-106	07/05/2013						1.15
Blank_Spike	Ruthenium-106	07/05/2013						
2489	Thorium-234	07/05/2013						2.15
2489	Tritium	07/09/2013						1.16
Blank	Tritium	07/09/2013	-20.8000	U				
Blank_Spike	Tritium	07/09/2013				90.40		
2489	Tritium	07/10/2013					111.0	
Johnson Artesian	Tritium	08/29/2013			69.0			
RB-D-03	Tritium	08/30/2013			69.0			
Blank	Tritium	08/30/2013	0	U	69.0			
RB-S-03	Tritium	09/02/2013			69.0			

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 13055301 **Lab Code:** GEN **Date Due:** 08/19/2013

Matrix: Water **Site Code:** RBL01 **Date Completed:** 09/09/2013

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
Blank_Spike	Tritium	09/02/2013			69.0	95.00		
2489	Uranium-235	07/05/2013						0.20
Blank_Spike	Uranium-235	07/05/2013						
2489	Uranium-238	07/05/2013						2.15
2489	Yttrium-88	07/05/2013						0.68
Blank_Spike	Yttrium-88	07/05/2013						

Sampling Quality Control Assessment

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

Sampling Protocol

Wells RB-D-01, RB-D-03, RB-S-03, and RB-W-01 were sampled using dedicated bladder pumps or a peristaltic pump with dedicated tubing. Data from these wells are qualified with an "F" flag in the database indicating the wells were purged and sampled using the low-flow sampling method. The data from well RB-W-01 were further qualified with a "Q" flag because this well was classified as Category II. All other sample locations were domestic wells or surface water locations.

Equipment Blank Assessment

Equipment blanks are prepared and analyzed to document contamination attributable to the sample collection process. One equipment blank was collected during this sampling event. There were no analytes detected in this blank.

Field Duplicate Analysis

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. A duplicate sample was collected from location CER #1 Black Sulphur. The relative error ratio for the sample and duplicate was less than 3, indicating acceptable precision.

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: Stephen Donivan — Stephen Donivan — 10-23-2013 — Date

Data Validation Lead: Stephen Donivan — Stephen Donivan — 10-23-2013 — 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 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.

There were no potential outliers identified, and the data for this event are acceptable as qualified.

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Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Brennan Windmill WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	N001	0	-	0	-2.63	U		#	16.1	9.31
Americium-241	pCi/L	05/16/2013	N001	0	-	0	-3.28	U		#	28.1	16.5
Antimony-125	pCi/L	05/16/2013	N001	0	-	0	-.599	U		#	9.69	5.65
Cerium-144	pCi/L	05/16/2013	N001	0	-	0	2.14	U		#	28.1	16.1
Cesium-134	pCi/L	05/16/2013	N001	0	-	0	-1.14	U		#	3.81	2.36
Cesium-137	pCi/L	05/16/2013	N001	0	-	0	-1.42	U		#	3.72	2.52
Cobalt-60	pCi/L	05/16/2013	N001	0	-	0	-2.78	U		#	3.67	2.72
Europium-152	pCi/L	05/16/2013	N001	0	-	0	-2.01	U		#	10.6	6.31
Europium-154	pCi/L	05/16/2013	N001	0	-	0	-4.29	U		#	12.3	8.39
Europium-155	pCi/L	05/16/2013	N001	0	-	0	-6.23	U		#	13.4	8.77
Lead-212	pCi/L	05/16/2013	N001	0	-	0	3.59	U		#	7.03	8.67
pH	s.u.	05/16/2013	N001	0	-	0	7.22			#		
Potassium-40	pCi/L	05/16/2013	N001	0	-	0	-9.83	U		#	50.9	30.9
Promethium-144	pCi/L	05/16/2013	N001	0	-	0	-.684	U		#	3.42	2.33
Promethium-146	pCi/L	05/16/2013	N001	0	-	0	0.217	U		#	4.87	2.66
Ruthenium-106	pCi/L	05/16/2013	N001	0	-	0	2.38	U		#	35.4	22.3
Specific Conductance	umhos /cm	05/16/2013	N001	0	-	0	2189			#		
Temperature	C	05/16/2013	N001	0	-	0	12.11			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Brennan Windmill WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	N001	0	-	0	-93.2	U		#	250	178
Tritium	pCi/L	05/16/2013	N001	0	-	0	125	U		#	295	175
Turbidity	NTU	05/16/2013	N001	0	-	0	8.02			#		
Uranium-235	pCi/L	05/16/2013	N001	0	-	0	0.886	U		#	26.1	18.1
Uranium-238	pCi/L	05/16/2013	N001	0	-	0	-93.2	U		#	250	178
Yttrium-88	pCi/L	05/16/2013	N001	0	-	0	2.94	U		#	5.99	2.94

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Johnson Artesian WL WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	N001	0	-	0	7.15	U		#	16.9	9.15
Americium-241	pCi/L	05/16/2013	N001	0	-	0	-.453	U		#	6.19	3.93
Antimony-125	pCi/L	05/16/2013	N001	0	-	0	1.17	U		#	9.12	4.91
Cerium-144	pCi/L	05/16/2013	N001	0	-	0	3.37	U		#	21.2	12.4
Cesium-134	pCi/L	05/16/2013	N001	0	-	0	0.783	U		#	4.34	2.29
Cesium-137	pCi/L	05/16/2013	N001	0	-	0	-.403	U		#	3.64	2.08
Cobalt-60	pCi/L	05/16/2013	N001	0	-	0	-1.38	U		#	3.59	2.17
Europium-152	pCi/L	05/16/2013	N001	0	-	0	1.45	U		#	10.8	7.02
Europium-154	pCi/L	05/16/2013	N001	0	-	0	-1.6	U		#	11.1	6.11
Europium-155	pCi/L	05/16/2013	N001	0	-	0	-2.89	U		#	9.16	5.64
Lead-212	pCi/L	05/16/2013	N001	0	-	0	0.364	U		#	6.92	5.13
pH	s.u.	05/16/2013	N001	0	-	0	8.15			#		
Potassium-40	pCi/L	05/16/2013	N001	0	-	0	31.3	U		#	53.1	32.3
Promethium-144	pCi/L	05/16/2013	N001	0	-	0	0.622	U		#	3.65	2.88
Promethium-146	pCi/L	05/16/2013	N001	0	-	0	0.733	U		#	4.33	2.34
Ruthenium-106	pCi/L	05/16/2013	N001	0	-	0	15.1	U		#	34.6	21.1
Specific Conductance	umhos /cm	05/16/2013	N001	0	-	0	2249			#		
Temperature	C	05/16/2013	N001	0	-	0	17.34			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Johnson Artesian WL WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	N001	0	-	0	8.99	U		#	90.1	54.1
Tritium	pCi/L	05/16/2013	N001	0	-	0	0	U		#	2.59	1.47
Turbidity	NTU	05/16/2013	N001	0	-	0	1.16			#		
Uranium-235	pCi/L	05/16/2013	N001	0	-	0	14.8	U		#	18.6	12.8
Uranium-238	pCi/L	05/16/2013	N001	0	-	0	8.99	U		#	90.1	54.1
Yttrium-88	pCi/L	05/16/2013	N001	0	-	0	1.3	U		#	6.47	3.21

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-D-01 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range		(Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-12	U	F	#	14	13.2
Americium-241	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-23.8	U	F	#	23.4	18.1
Antimony-125	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-.591	U	F	#	7.98	4.66
Cerium-144	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-11.6	U	F	#	18.9	14.2
Cesium-134	pCi/L	05/16/2013	N001	16628.77	-	16628.77	0.183	U	F	#	3.07	2.13
Cesium-137	pCi/L	05/16/2013	N001	16628.77	-	16628.77	1.03	U	F	#	3.2	2.03
Cobalt-60	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-.0272	U	F	#	3.5	1.92
Europium-152	pCi/L	05/16/2013	N001	16628.77	-	16628.77	4.92	U	F	#	8.31	5.38
Europium-154	pCi/L	05/16/2013	N001	16628.77	-	16628.77	0.0532	U	F	#	9.29	5.3
Europium-155	pCi/L	05/16/2013	N001	16628.77	-	16628.77	3.01	U	F	#	9.81	5.47
Lead-212	pCi/L	05/16/2013	N001	16628.77	-	16628.77	5.52	U	F	#	6.53	7.97
pH	s.u.	05/16/2013	N001	16628.77	-	16628.77	7.67		F	#		
Potassium-40	pCi/L	05/16/2013	N001	16628.77	-	16628.77	51.9		UF	#	30.6	43.5
Promethium-144	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-.262	U	F	#	3.32	1.88
Promethium-146	pCi/L	05/16/2013	N001	16628.77	-	16628.77	1.54	U	F	#	3.72	2.21
Ruthenium-106	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-6	U	F	#	29.4	16.9
Specific Conductance	umhos /cm	05/16/2013	N001	16628.77	-	16628.77	5876		F	#		
Temperature	C	05/16/2013	N001	16628.77	-	16628.77	14.2		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-D-01 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range		(Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-103	U	F	#	214	186
Tritium	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-40.2	U	F	#	304	168
Turbidity	NTU	05/16/2013	N001	16628.77	-	16628.77	3.3		F	#		
Uranium-235	pCi/L	05/16/2013	N001	16628.77	-	16628.77	11.6	U	F	#	20.1	19.9
Uranium-238	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-103	U	F	#	214	186
Yttrium-88	pCi/L	05/16/2013	N001	16628.77	-	16628.77	-1.48	U	F	#	4.49	2.71

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-D-03 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/14/2013	N001	0	-	0	8.65	U	F	#	11	16.1
Americium-241	pCi/L	05/14/2013	N001	0	-	0	-13.9	U	F	#	13.1	10.1
Antimony-125	pCi/L	05/14/2013	N001	0	-	0	3.19	U	F	#	9.25	5.2
Cerium-144	pCi/L	05/14/2013	N001	0	-	0	-7.8	U	F	#	22.6	13.7
Cesium-134	pCi/L	05/14/2013	N001	0	-	0	1.15	U	F	#	3.98	2.16
Cesium-137	pCi/L	05/14/2013	N001	0	-	0	1.26	U	F	#	3.48	2.13
Cobalt-60	pCi/L	05/14/2013	N001	0	-	0	0.215	U	F	#	3.55	1.88
Europium-152	pCi/L	05/14/2013	N001	0	-	0	7.13	U	F	#	9.75	6.83
Europium-154	pCi/L	05/14/2013	N001	0	-	0	0.94	U	F	#	9.06	4.71
Europium-155	pCi/L	05/14/2013	N001	0	-	0	-.699	U	F	#	11.5	7.47
Lead-212	pCi/L	05/14/2013	N001	0	-	0	0	U	F	#	7.28	6.58
pH	s.u.	05/14/2013	N001	0	-	0	8.8		F	#		
Potassium-40	pCi/L	05/14/2013	N001	0	-	0	10.8	U	F	#	45.5	25.4
Promethium-144	pCi/L	05/14/2013	N001	0	-	0	-.562	U	F	#	3.29	1.86
Promethium-146	pCi/L	05/14/2013	N001	0	-	0	-.36	U	F	#	3.98	2.27
Ruthenium-106	pCi/L	05/14/2013	N001	0	-	0	1.1	U	F	#	33	18.8
Specific Conductance	umhos /cm	05/14/2013	N001	0	-	0	842		F	#		
Temperature	C	05/14/2013	N001	0	-	0	9.46		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-D-03 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/14/2013	N001	0	-	0	-115	U	F	#	135	101
Tritium	pCi/L	05/14/2013	N001	0	-	0	0.637	U	F	#	2.67	1.56
Turbidity	NTU	05/14/2013	N001	0	-	0	4.41		F	#		
Uranium-235	pCi/L	05/14/2013	N001	0	-	0	7.54	U	F	#	19.9	17.4
Uranium-238	pCi/L	05/14/2013	N001	0	-	0	-115	U	F	#	135	101
Yttrium-88	pCi/L	05/14/2013	N001	0	-	0	-1.4	U	F	#	4.27	2.58

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-S-03 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range		(Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/14/2013	N001	16628.75	-	16628.75	-3.44	U	F	#	10.8	7.3
Americium-241	pCi/L	05/14/2013	N001	16628.75	-	16628.75	12.8	U	F	#	16	14.5
Antimony-125	pCi/L	05/14/2013	N001	16628.75	-	16628.75	-2.63	U	F	#	8.27	5.07
Cerium-144	pCi/L	05/14/2013	N001	16628.75	-	16628.75	2.93	U	F	#	22.7	13.9
Cesium-134	pCi/L	05/14/2013	N001	16628.75	-	16628.75	1.01	U	F	#	3.39	1.81
Cesium-137	pCi/L	05/14/2013	N001	16628.75	-	16628.75	0.282	U	F	#	2.95	2.59
Cobalt-60	pCi/L	05/14/2013	N001	16628.75	-	16628.75	0.917	U	F	#	3.5	1.8
Europium-152	pCi/L	05/14/2013	N001	16628.75	-	16628.75	2.09	U	F	#	8.5	4.73
Europium-154	pCi/L	05/14/2013	N001	16628.75	-	16628.75	-6.72	U	F	#	7.32	5.73
Europium-155	pCi/L	05/14/2013	N001	16628.75	-	16628.75	0.38	U	F	#	10.9	6.29
Lead-212	pCi/L	05/14/2013	N001	16628.75	-	16628.75	5.62	U	F	#	7.01	6.84
pH	s.u.	05/14/2013	N001	16628.75	-	16628.75	8.32		F	#		
Potassium-40	pCi/L	05/14/2013	N001	16628.75	-	16628.75	-11.8	U	F	#	38.3	24
Promethium-144	pCi/L	05/14/2013	N001	16628.75	-	16628.75	0.828	U	F	#	3.04	1.63
Promethium-146	pCi/L	05/14/2013	N001	16628.75	-	16628.75	-.331	U	F	#	3.66	2.43
Ruthenium-106	pCi/L	05/14/2013	N001	16628.75	-	16628.75	2.01	U	F	#	29.6	16
Specific Conductance	umhos /cm	05/14/2013	N001	16628.75	-	16628.75	850		F	#		
Temperature	C	05/14/2013	N001	16628.75	-	16628.75	11.16		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-S-03 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range		(Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/14/2013	N001	16628.75	-	16628.75	118	U	F	#	135	188
Tritium	pCi/L	05/14/2013	N001	16628.75	-	16628.75	2.04	U	F	#	2.62	1.76
Turbidity	NTU	05/14/2013	N001	16628.75	-	16628.75	3.34		F	#		
Uranium-235	pCi/L	05/14/2013	N001	16628.75	-	16628.75	3.87	U	F	#	17.6	15.4
Uranium-238	pCi/L	05/14/2013	N001	16628.75	-	16628.75	118	U	F	#	135	188
Yttrium-88	pCi/L	05/14/2013	N001	16628.75	-	16628.75	-1.98	U	F	#	4.24	2.65

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-W-01 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/14/2013	0001	0	-	0	-.934	U	FQ	#	12.7	8.58
Americium-241	pCi/L	05/14/2013	0001	0	-	0	3.75	U	FQ	#	18.4	10.6
Antimony-125	pCi/L	05/14/2013	0001	0	-	0	-2.07	U	FQ	#	8.22	4.86
Cerium-144	pCi/L	05/14/2013	0001	0	-	0	6.16	U	FQ	#	23.4	13.8
Cesium-134	pCi/L	05/14/2013	0001	0	-	0	-1.63	U	FQ	#	2.87	1.86
Cesium-137	pCi/L	05/14/2013	0001	0	-	0	0.328	U	FQ	#	3.06	2.08
Cobalt-60	pCi/L	05/14/2013	0001	0	-	0	0.438	U	FQ	#	3.27	1.71
Europium-152	pCi/L	05/14/2013	0001	0	-	0	-.28	U	FQ	#	8.44	4.89
Europium-154	pCi/L	05/14/2013	0001	0	-	0	-.405	U	FQ	#	8.64	4.7
Europium-155	pCi/L	05/14/2013	0001	0	-	0	-1.16	U	FQ	#	11.2	6.64
Lead-212	pCi/L	05/14/2013	0001	0	-	0	4.43	U	FQ	#	7.13	6.47
pH	s.u.	05/14/2013	N001	0	-	0	8.41		FQ	#		
Potassium-40	pCi/L	05/14/2013	0001	0	-	0	-.626	U	FQ	#	41.6	23.7
Promethium-144	pCi/L	05/14/2013	0001	0	-	0	0.462	U	FQ	#	3.15	1.76
Promethium-146	pCi/L	05/14/2013	0001	0	-	0	-.0492	U	FQ	#	3.68	2.07
Ruthenium-106	pCi/L	05/14/2013	0001	0	-	0	4.26	U	FQ	#	26.4	14.5
Specific Conductance	umhos /cm	05/14/2013	N001	0	-	0	1427		FQ	#		
Temperature	C	05/14/2013	N001	0	-	0	11.33		FQ	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: RB-W-01 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/14/2013	0001	0	-	0	-66.1	U	FQ	#	170	115
Tritium	pCi/L	05/14/2013	N001	0	-	0	8.41	U	FQ	#	302	170
Turbidity	NTU	05/14/2013	N001	0	-	0	41.9		FQ	#		
Uranium-235	pCi/L	05/14/2013	0001	0	-	0	4.41	U	FQ	#	22.4	16.4
Uranium-238	pCi/L	05/14/2013	0001	0	-	0	-66.1	U	FQ	#	170	115
Yttrium-88	pCi/L	05/14/2013	0001	0	-	0	0.255	U	FQ	#	4.63	2.34

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

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 RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: B-1 Equity Camp SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/15/2013	N001	2.85	U		#	15.1	9.54
Americium-241	pCi/L	05/15/2013	N001	9.29	U		#	31.4	19
Antimony-125	pCi/L	05/15/2013	N001	1.27	U		#	10.2	5.57
Cerium-144	pCi/L	05/15/2013	N001	8.23	U		#	25.4	14.6
Cesium-134	pCi/L	05/15/2013	N001	0.252	U		#	3.1	1.56
Cesium-137	pCi/L	05/15/2013	N001	-1.95	U		#	2.86	1.95
Cobalt-60	pCi/L	05/15/2013	N001	-1.61	U		#	3.62	2.62
Europium-152	pCi/L	05/15/2013	N001	3.5	U		#	10.5	5.76
Europium-154	pCi/L	05/15/2013	N001	-1.55	U		#	8.94	4.78
Europium-155	pCi/L	05/15/2013	N001	3.94	U		#	12.6	7.15
Lead-212	pCi/L	05/15/2013	N001	-2.14	U		#	7.12	5.14
pH	s.u.	05/15/2013	N001	8.39			#		
Potassium-40	pCi/L	05/15/2013	N001	5.2	U		#	50.7	26.6
Promethium-144	pCi/L	05/15/2013	N001	-1.12	U		#	3.69	2.29
Promethium-146	pCi/L	05/15/2013	N001	0.249	U		#	3.92	2.13
Ruthenium-106	pCi/L	05/15/2013	N001	-7.74	U		#	30.4	18.3
Specific Conductance	umhos/cm	05/15/2013	N001	1022			#		
Temperature	C	05/15/2013	N001	18			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: B-1 Equity Camp SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/15/2013	N001	24.3	U		#	237	200
Tritium	pCi/L	05/15/2013	N001	-20.9	U		#	301	167
Turbidity	NTU	05/15/2013	N001	5.9			#		
Uranium-235	pCi/L	05/15/2013	N001	-6.28	U		#	21.6	16.1
Uranium-238	pCi/L	05/15/2013	N001	24.3	U		#	237	200
Yttrium-88	pCi/L	05/15/2013	N001	-2	U		#	4.87	3.03

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: CER #1 Black Sulphur SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/15/2013	N001	-4.59	U		#	12.2	8.21
Actinium-228	pCi/L	05/15/2013	N002	5.3	U		#	17.2	11.5
Americium-241	pCi/L	05/15/2013	N001	12.8	U		#	23.3	14.4
Americium-241	pCi/L	05/15/2013	N002	4.33	U		#	24.4	14.9
Antimony-125	pCi/L	05/15/2013	N001	-.822	U		#	8.79	4.93
Antimony-125	pCi/L	05/15/2013	N002	0.203	U		#	10.7	6.08
Cerium-144	pCi/L	05/15/2013	N001	2.38	U		#	22.5	12.6
Cerium-144	pCi/L	05/15/2013	N002	-7.48	U		#	25.4	15.4
Cesium-134	pCi/L	05/15/2013	N001	1.79	U		#	3.72	2
Cesium-134	pCi/L	05/15/2013	N002	-1.2	U		#	3.85	2.32
Cesium-137	pCi/L	05/15/2013	N001	-.446	U		#	2.98	1.73
Cesium-137	pCi/L	05/15/2013	N002	1.48	U		#	3.72	3.23
Cobalt-60	pCi/L	05/15/2013	N001	0.199	U		#	3.34	1.69
Cobalt-60	pCi/L	05/15/2013	N002	0.00964	U		#	4.57	2.5
Europium-152	pCi/L	05/15/2013	N001	0.26	U		#	8.67	4.7
Europium-152	pCi/L	05/15/2013	N002	3.47	U		#	11.1	6.21
Europium-154	pCi/L	05/15/2013	N001	-.817	U		#	8.02	4.19
Europium-154	pCi/L	05/15/2013	N002	0.57	U		#	10.6	5.55

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: CER #1 Black Sulphur SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Europium-155	pCi/L	05/15/2013	N001	-2.16	U		#	10.8	6.19
Europium-155	pCi/L	05/15/2013	N002	-1.97	U		#	13.5	7.81
Lead-212	pCi/L	05/15/2013	N001	3.98	U		#	6.9	4.85
Lead-212	pCi/L	05/15/2013	N002	-1.65	U		#	7.4	4.75
pH	s.u.	05/15/2013	N001	8.03			#		
Potassium-40	pCi/L	05/15/2013	N001	-9.94	U		#	39.3	22.3
Potassium-40	pCi/L	05/15/2013	N002	-9.22	U		#	58.9	34.8
Promethium-144	pCi/L	05/15/2013	N001	-.758	U		#	3.19	1.81
Promethium-144	pCi/L	05/15/2013	N002	0.769	U		#	4.23	2.31
Promethium-146	pCi/L	05/15/2013	N001	-.407	U		#	3.86	2.17
Promethium-146	pCi/L	05/15/2013	N002	-.531	U		#	4.59	2.68
Ruthenium-106	pCi/L	05/15/2013	N001	5.02	U		#	30.6	16.7
Ruthenium-106	pCi/L	05/15/2013	N002	-8.83	U		#	32	18.7
Specific Conductance	umhos/cm	05/15/2013	N001	1439			#		
Temperature	C	05/15/2013	N001	12.85			#		
Thorium-234	pCi/L	05/15/2013	N001	0	U		#	174	195
Thorium-234	pCi/L	05/15/2013	N002	70	U		#	202	177
Tritium	pCi/L	05/15/2013	N001	-4.18	U		#	301	168

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: CER #1 Black Sulphur SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Tritium	pCi/L	05/15/2013	N002	133	U		#	252	152
Turbidity	NTU	05/15/2013	N001	7.2			#		
Uranium-235	pCi/L	05/15/2013	N001	-5.81	U		#	21.3	15.3
Uranium-235	pCi/L	05/15/2013	N002	6.76	U		#	24.1	21.3
Uranium-238	pCi/L	05/15/2013	N001	0	U		#	174	195
Uranium-238	pCi/L	05/15/2013	N002	70	U		#	202	177
Yttrium-88	pCi/L	05/15/2013	N001	0.213	U		#	4.53	2.26
Yttrium-88	pCi/L	05/15/2013	N002	2.81	U		#	6.69	3.9

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: CER #4 Black Sulphur SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/15/2013	N001	4.8	U		#	13.2	8.98
Americium-241	pCi/L	05/15/2013	N001	-2.55	U		#	17	9.51
Antimony-125	pCi/L	05/15/2013	N001	-1.72	U		#	8.3	4.8
Cerium-144	pCi/L	05/15/2013	N001	1.73	U		#	21.6	12.3
Cesium-134	pCi/L	05/15/2013	N001	0	U		#	3.77	2.71
Cesium-137	pCi/L	05/15/2013	N001	-2.05	U		#	2.7	2
Cobalt-60	pCi/L	05/15/2013	N001	-.826	U		#	2.96	1.99
Europium-152	pCi/L	05/15/2013	N001	-.561	U		#	9.07	5.04
Europium-154	pCi/L	05/15/2013	N001	-1.54	U		#	9.2	5.03
Europium-155	pCi/L	05/15/2013	N001	-2.6	U		#	11.4	6.66
Lead-212	pCi/L	05/15/2013	N001	-4.26	U		#	6.17	4.72
pH	s.u.	05/15/2013	N001	7.66			#		
Potassium-40	pCi/L	05/15/2013	N001	25.5	U		#	32.6	25.9
Promethium-144	pCi/L	05/15/2013	N001	2.11	U		#	3.71	2.07
Promethium-146	pCi/L	05/15/2013	N001	0.146	U		#	3.85	2.12
Ruthenium-106	pCi/L	05/15/2013	N001	0	U		#	31.5	33.6
Specific Conductance	umhos/cm	05/15/2013	N001	1342			#		
Temperature	C	05/15/2013	N001	11.97			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: CER #4 Black Sulphur SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/15/2013	N001	-47.4	U		#	162	106
Tritium	pCi/L	05/15/2013	N001	61.5	U		#	295	170
Turbidity	NTU	05/15/2013	N001	4.8			#		
Uranium-235	pCi/L	05/15/2013	N001	-4.3	U		#	19.8	13.5
Uranium-238	pCi/L	05/15/2013	N001	-47.4	U		#	162	106
Yttrium-88	pCi/L	05/15/2013	N001	0.792	U		#	5.24	2.64

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek #1 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/15/2013	N001	-1.18	U		#	16.5	11.1
Americium-241	pCi/L	05/15/2013	N001	-8.58	U		#	12.3	8.66
Antimony-125	pCi/L	05/15/2013	N001	2.12	U		#	9.79	6.34
Cerium-144	pCi/L	05/15/2013	N001	4.54	U		#	24.1	13.5
Cesium-134	pCi/L	05/15/2013	N001	1.89	U		#	3.99	2.19
Cesium-137	pCi/L	05/15/2013	N001	1.27	U		#	3.55	1.93
Cobalt-60	pCi/L	05/15/2013	N001	-1.13	U		#	3.49	2.29
Europium-152	pCi/L	05/15/2013	N001	1.67	U		#	10.1	5.76
Europium-154	pCi/L	05/15/2013	N001	-1.52	U		#	9.61	5.32
Europium-155	pCi/L	05/15/2013	N001	3.22	U		#	11.8	6.91
Lead-212	pCi/L	05/15/2013	N001	1.46	U		#	6.84	4.98
pH	s.u.	05/15/2013	N001	7.76			#		
Potassium-40	pCi/L	05/15/2013	N001	-8.21	U		#	43.9	23.7
Promethium-144	pCi/L	05/15/2013	N001	-.207	U		#	3.68	2.39
Promethium-146	pCi/L	05/15/2013	N001	-.825	U		#	3.97	2.26
Ruthenium-106	pCi/L	05/15/2013	N001	13.7	U		#	31.9	17.4
Specific Conductance	umhos/cm	05/15/2013	N001	1494			#		
Temperature	C	05/15/2013	N001	11			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek #1 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/15/2013	N001	34.8	U		#	134	92.2
Tritium	pCi/L	05/15/2013	N001	-96.4	U		#	295	158
Turbidity	NTU	05/15/2013	N001	2.49			#		
Uranium-235	pCi/L	05/15/2013	N001	0.766	U		#	22.3	15.2
Uranium-238	pCi/L	05/15/2013	N001	34.8	U		#	134	92.2
Yttrium-88	pCi/L	05/15/2013	N001	1.81	U		#	5.4	2.68

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek #3 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	N001	1.9	U		#	15.5	10.8
Americium-241	pCi/L	05/16/2013	N001	-23.9	U		#	12.2	13.4
Antimony-125	pCi/L	05/16/2013	N001	-.549	U		#	8.91	5.05
Cerium-144	pCi/L	05/16/2013	N001	-8.82	U		#	22.2	14.2
Cesium-134	pCi/L	05/16/2013	N001	1.12	U		#	3.63	2.07
Cesium-137	pCi/L	05/16/2013	N001	-.269	U		#	3.59	1.99
Cobalt-60	pCi/L	05/16/2013	N001	0.299	U		#	3.27	1.91
Europium-152	pCi/L	05/16/2013	N001	0.627	U		#	9.48	6.78
Europium-154	pCi/L	05/16/2013	N001	0.609	U		#	9.95	5.27
Europium-155	pCi/L	05/16/2013	N001	1.18	U		#	11.4	6.44
Lead-212	pCi/L	05/16/2013	N001	0	U		#	5.81	7.23
pH	s.u.	05/16/2013	N001	7.92			#		
Potassium-40	pCi/L	05/16/2013	N001	19.3	U		#	32.9	32
Promethium-144	pCi/L	05/16/2013	N001	0.456	U		#	3.55	1.93
Promethium-146	pCi/L	05/16/2013	N001	-.434	U		#	3.83	2.54
Ruthenium-106	pCi/L	05/16/2013	N001	-15.8	U		#	27.6	18.6
Specific Conductance	umhos/cm	05/16/2013	N001	1461			#		
Temperature	C	05/16/2013	N001	12.84			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek #3 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	N001	-70.4	U		#	137	89.9
Tritium	pCi/L	05/16/2013	N001	14.6	U		#	299	168
Turbidity	NTU	05/16/2013	N001	3.95			#		
Uranium-235	pCi/L	05/16/2013	N001	-3.51	U		#	21.9	15.4
Uranium-238	pCi/L	05/16/2013	N001	-70.4	U		#	137	89.9
Yttrium-88	pCi/L	05/16/2013	N001	0	U		#	6.27	5.08

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 500ft Dwn SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	0001	5.15	U		#	13.7	9.7
Americium-241	pCi/L	05/16/2013	0001	-2.01	U		#	14.4	9.63
Antimony-125	pCi/L	05/16/2013	0001	-2.67	U		#	7.1	4.44
Cerium-144	pCi/L	05/16/2013	0001	-5.61	U		#	20.2	11.8
Cesium-134	pCi/L	05/16/2013	0001	-1.07	U		#	3.16	1.9
Cesium-137	pCi/L	05/16/2013	0001	2.75	U		#	3.68	2.19
Cobalt-60	pCi/L	05/16/2013	0001	0.202	U		#	3.44	1.79
Europium-152	pCi/L	05/16/2013	0001	1.57	U		#	9	5.06
Europium-154	pCi/L	05/16/2013	0001	-.266	U		#	8.48	4.46
Europium-155	pCi/L	05/16/2013	0001	2.24	U		#	11.2	6.61
Lead-212	pCi/L	05/16/2013	0001	-2.35	U		#	6.42	4.32
pH	s.u.	05/16/2013	N001	8.46			#		
Potassium-40	pCi/L	05/16/2013	0001	-15.5	U		#	42.9	26.5
Promethium-144	pCi/L	05/16/2013	0001	0.726	U		#	3.36	1.82
Promethium-146	pCi/L	05/16/2013	0001	-.0567	U		#	3.66	2.09
Ruthenium-106	pCi/L	05/16/2013	0001	13.7	U		#	28.2	15.9
Specific Conductance	umhos/cm	05/16/2013	N001	1536			#		
Temperature	C	05/16/2013	N001	19.08			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 500ft Dwn SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	0001	21.6	U		#	149	105
Tritium	pCi/L	05/16/2013	N001	68.9	U		#	300	173
Turbidity	NTU	05/16/2013	N001	16.7			#		
Uranium-235	pCi/L	05/16/2013	0001	-9.73	U		#	19.3	13.7
Uranium-238	pCi/L	05/16/2013	0001	21.6	U		#	149	105
Yttrium-88	pCi/L	05/16/2013	0001	-1.7	U		#	4.28	2.65

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 500ft Ups SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	N001	2.82	U		#	15	10.5
Americium-241	pCi/L	05/16/2013	N001	10.2	U		#	19.5	12.7
Antimony-125	pCi/L	05/16/2013	N001	0.954	U		#	9.22	5.06
Cerium-144	pCi/L	05/16/2013	N001	-5.71	U		#	23.7	15.3
Cesium-134	pCi/L	05/16/2013	N001	0.197	U		#	3.33	2.11
Cesium-137	pCi/L	05/16/2013	N001	0.818	U		#	4.32	2.94
Cobalt-60	pCi/L	05/16/2013	N001	-.232	U		#	3.33	1.81
Europium-152	pCi/L	05/16/2013	N001	-.35	U		#	9.88	5.65
Europium-154	pCi/L	05/16/2013	N001	0.494	U		#	9.84	5.21
Europium-155	pCi/L	05/16/2013	N001	-1.55	U		#	13.1	7.59
Lead-212	pCi/L	05/16/2013	N001	-1.43	U		#	7.33	4.58
pH	s.u.	05/16/2013	N001	8.53			#		
Potassium-40	pCi/L	05/16/2013	N001	-16.1	U		#	42.2	26.8
Promethium-144	pCi/L	05/16/2013	N001	-2.42	U		#	3.44	3.17
Promethium-146	pCi/L	05/16/2013	N001	-.271	U		#	4.46	2.51
Ruthenium-106	pCi/L	05/16/2013	N001	-14	U		#	31.5	20
Specific Conductance	umhos/cm	05/16/2013	N001	1387			#		
Temperature	C	05/16/2013	N001	20.3			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 500ft Ups SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	N001	29.2	U		#	183	122
Tritium	pCi/L	05/16/2013	N001	126	U		#	298	177
Turbidity	NTU	05/16/2013	N001	9.69			#		
Uranium-235	pCi/L	05/16/2013	N001	12.7	U		#	24.4	19.3
Uranium-238	pCi/L	05/16/2013	N001	29.2	U		#	183	122
Yttrium-88	pCi/L	05/16/2013	N001	1.83	U		#	5.57	2.73

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 6800ft Up SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	N001	2.06	U		#	13.2	8.58
Americium-241	pCi/L	05/16/2013	N001	1.03	U		#	17.2	10.5
Antimony-125	pCi/L	05/16/2013	N001	3.53	U		#	8.34	4.58
Cerium-144	pCi/L	05/16/2013	N001	-.596	U		#	21.9	12.5
Cesium-134	pCi/L	05/16/2013	N001	-.911	U		#	2.86	1.68
Cesium-137	pCi/L	05/16/2013	N001	0.534	U		#	3.23	1.77
Cobalt-60	pCi/L	05/16/2013	N001	0.372	U		#	3.58	1.83
Europium-152	pCi/L	05/16/2013	N001	-1.38	U		#	9.15	5.18
Europium-154	pCi/L	05/16/2013	N001	-.417	U		#	8.84	4.62
Europium-155	pCi/L	05/16/2013	N001	0.00125	U		#	11.2	7.02
Lead-212	pCi/L	05/16/2013	N001	0.148	U		#	6.56	4.97
pH	s.u.	05/16/2013	N001	7.64			#		
Potassium-40	pCi/L	05/16/2013	N001	3.64	U		#	45.6	24.1
Promethium-144	pCi/L	05/16/2013	N001	1.47	U		#	3.66	1.97
Promethium-146	pCi/L	05/16/2013	N001	-.194	U		#	3.87	2.17
Ruthenium-106	pCi/L	05/16/2013	N001	2.42	U		#	30.8	17.1
Specific Conductance	umhos/cm	05/16/2013	N001	1304			#		
Temperature	C	05/16/2013	N001	13.12			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 6800ft Up SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	N001	56.5	U		#	144	105
Tritium	pCi/L	05/16/2013	N001	-14.5	U		#	299	166
Turbidity	NTU	05/16/2013	N001	5.96			#		
Uranium-235	pCi/L	05/16/2013	N001	4.8	U		#	20.8	16.9
Uranium-238	pCi/L	05/16/2013	N001	56.5	U		#	144	105
Yttrium-88	pCi/L	05/16/2013	N001	-.164	U		#	4.85	2.55

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 8400ft Dw SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Actinium-228	pCi/L	05/16/2013	N001	-.693	U		#	13.6	8.21
Americium-241	pCi/L	05/16/2013	N001	-.66	U		#	11	7.36
Antimony-125	pCi/L	05/16/2013	N001	-2.86	U		#	7.79	4.9
Cerium-144	pCi/L	05/16/2013	N001	9.57	U		#	22.7	13.2
Cesium-134	pCi/L	05/16/2013	N001	0.321	U		#	3.43	2.15
Cesium-137	pCi/L	05/16/2013	N001	0.57	U		#	3.25	1.76
Cobalt-60	pCi/L	05/16/2013	N001	0.488	U		#	3.57	2.07
Europium-152	pCi/L	05/16/2013	N001	-6.3	U		#	8.28	5.96
Europium-154	pCi/L	05/16/2013	N001	2.38	U		#	8.63	4.9
Europium-155	pCi/L	05/16/2013	N001	-.78	U		#	10.2	5.75
Lead-212	pCi/L	05/16/2013	N001	6.16	U		#	6.87	5.68
pH	s.u.	05/16/2013	N001	8.47			#		
Potassium-40	pCi/L	05/16/2013	N001	-1.57	U		#	43.1	22.6
Promethium-144	pCi/L	05/16/2013	N001	0.616	U		#	3.01	1.62
Promethium-146	pCi/L	05/16/2013	N001	-.36	U		#	3.62	2
Ruthenium-106	pCi/L	05/16/2013	N001	6.98	U		#	30.7	16.7
Specific Conductance	umhos/cm	05/16/2013	N001	1444			#		
Temperature	C	05/16/2013	N001	17.23			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site
REPORT DATE: 10/11/2013
Location: Fawn Creek 8400ft Dw SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Thorium-234	pCi/L	05/16/2013	N001	55.3	U		#	126	124
Tritium	pCi/L	05/16/2013	N001	-4.18	U		#	300	168
Turbidity	NTU	05/16/2013	N001	25.8			#		
Uranium-235	pCi/L	05/16/2013	N001	1.81	U		#	20.9	14.2
Uranium-238	pCi/L	05/16/2013	N001	55.3	U		#	126	124
Yttrium-88	pCi/L	05/16/2013	N001	-.691	U		#	4.07	2.27

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

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

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Equipment Blank Data

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BLANKS REPORT

LAB: GENERAL ENGINEERING (Charleston, SC)
RIN: 13055301
Report Date: 10/11/2013

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Actinium-228	RBL01	0999	05/17/2013	N001	pCi/L	-1.12	U		16.3	9.87	E
Americium-241	RBL01	0999	05/17/2013	N001	pCi/L	0.677	U		31.3	19.9	E
Antimony-125	RBL01	0999	05/17/2013	N001	pCi/L	-.298	U		8.94	5.01	E
Cerium-144	RBL01	0999	05/17/2013	N001	pCi/L	-4.84	U		24.2	15.4	E
Cesium-134	RBL01	0999	05/17/2013	N001	pCi/L	1.94	U		4.26	2.28	E
Cesium-137	RBL01	0999	05/17/2013	N001	pCi/L	0.701	U		3.45	1.79	E
Cobalt-60	RBL01	0999	05/17/2013	N001	pCi/L	0.0568	U		3.52	1.79	E
Europium-152	RBL01	0999	05/17/2013	N001	pCi/L	0.359	U		9.99	5.54	E
Europium-154	RBL01	0999	05/17/2013	N001	pCi/L	-3.92	U		10	6.27	E
Europium-155	RBL01	0999	05/17/2013	N001	pCi/L	3.49	U		13.5	7.81	E
Lead-212	RBL01	0999	05/17/2013	N001	pCi/L	-1.5	U		8.12	4.77	E
Potassium-40	RBL01	0999	05/17/2013	N001	pCi/L	-11.8	U		46.3	27.8	E
Promethium-144	RBL01	0999	05/17/2013	N001	pCi/L	0.913	U		3.65	1.92	E
Promethium-146	RBL01	0999	05/17/2013	N001	pCi/L	1.33	U		4.41	2.51	E
Ruthenium-106	RBL01	0999	05/17/2013	N001	pCi/L	22.6	U		35.4	23.7	E
Thorium-234	RBL01	0999	05/17/2013	N001	pCi/L	0	U		234	378	E
Tritium	RBL01	0999	05/17/2013	N001	pCi/L	-80.4	U		296	160	E
Uranium-235	RBL01	0999	05/17/2013	N001	pCi/L	4.64	U		23.1	17.9	E
Uranium-238	RBL01	0999	05/17/2013	N001	pCi/L	0	U		234	378	E
Yttrium-88	RBL01	0999	05/17/2013	N001	pCi/L	0.485	U		5.58	2.8	E

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.		

SAMPLE TYPES:

E	Equipment Blank.

Attachment 3
Sampling and Analysis Work Order

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Stoller

established 1959

Task Order LM00-502
Control Number 13-0505

April 18, 2013

U. S. Department of Energy
Office of Legacy Management
ATTN: Mr. Art Kleinrath
Site Lead
2597 Legacy Way
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S. M. Stoller Corporation (Stoller)
Task Order LM00-502 – Other Defense Activities – Other Sites
May 2013 Environmental Sampling at Rio Blanco, Colorado

REFERENCE: LM-502-07-618 Rio Blanco, Colorado

Dear Mr. Kleinrath:

The purpose of this letter is to inform you of the upcoming sampling event at Rio Blanco, Colorado. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Rio Blanco site. Water quality data will be collected from monitoring wells and surface locations at this site as part of the routine environmental sampling scheduled to begin the week of May 13, 2013.

The following lists show the locations scheduled for sampling during this event.

Monitoring Wells

On-site

RB-D-01	RB-D-03	RB-S-03	RB-W-01

Off-site

Johnson Artesian WL	Brennan Windmill

Surface Water

On-Site

Fawn Creek 500ft Dwn	Fawn Creek 500ft Ups

Off-Site

B-1 Equity Camp	CER #1 Black Sulphur	CER #4 Black Sulphur	Fawn Creek #1
Fawn Creek #3	Fawn Creek 6800ft Up	Fawn Creek 8400ft Dw	

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Notification for access to locations on private property will be conducted prior to the beginning of fieldwork.

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

Please contact me at (970) 248-6477 if you have any questions or concerns.

Sincerely,

Rick Hutton

Digitally signed by Rick Hutton
DN: c=us, o=u.s. government, ou=department of energy, ou=Energy IT Services, ou=Legacy Management, ou=People, cn=Rick Hutton
Date: 2013.04.19 10:07:16 -06'00'

Rick Hutton
Site lead

RH/lcg/dc
Enclosures (3)

cc: (electronic)
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
rc-grand.junction
File: RBL 410.02(A)

Sampling Frequencies for Locations at Rio Blanco, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
On-Site						
RB-D-01			X			
RB-D-03			X			
RB-S-03			X			
RB-W-01			X			
Off-Site						
Johnson Artesian WL			X			
Brennan Windmill			X			
Surface Locations						
On-Site						
Fawn Creek 500ft Dwn			X			
Fawn Creek 500ft Ups			X			
Off-Site						
B-1 Equity Camp			X			
CER #1 Black Sulphur			X			
CER #4 Black Sulphur			X			
Fawn Creek #1			X			
Fawn Creek #3			X			
Fawn Creek 6800ft Up			X			
Fawn Creek 8400ft Dw			X			

Sampling conducted in May

Constituent Sampling Breakdown					
Site	**Rio Blanco**				
Analyte	**Groundwater**	**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	6	9			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential					
pH	X	X			
Specific Conductance	X	X			
Turbidity	X				
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Calcium					
Chloride					
Chromium					
Gamma Spec	X	X	10 pCi/L	Gamma Spectrometry	GAM-A-001
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium					
Selenium					
Silica					
Sodium					
Total Dissolved Solids					
Tritium	X	X	400 pCi/L	Liquid Scintillation	LSC-A-001
Tritium, enriched	25% of the samples	25% of the samples	10 pCi/L	Liquid Scintillation	LMR-15
Uranium					
Vanadium					
Zinc					
Total No. of Analytes	3	3			
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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Stoller
established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: June 17, 2013

TO: Rick Hutton

FROM: Dan Sellers

SUBJECT: Trip Report (LTHMP Sampling) (REVISED)

Site: Rio Blanco, CO

Dates of Sampling Event: May 14-16, 2013.

Team Members: Kent Moe and Dan Sellers

Number of Locations Sampled: 2 on-site wells, 4 private wells, and 9 surface locations. All samples will be analyzed for tritium and gamma spec; a select set of samples will also be analyzed for enriched tritium (RB-D-03, RB-S-03, and Johnson Artesian WL).

Sampling Method: Information about how samples were collected at each location can be viewed electronically from the FDCS found \\crow\SMS\13055301\FieldData. Samples were collected according to the *Sampling and Analysis Plan for the U. S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351).

Site Specific Information: Small bladder pump (~200ml) in well RB-D-01 had to be replaced. On May15, 2013 a larger bladder pump (~300 ml) was placed in well and would not pump water (leak in O-ring). The sampling event was stopped due to lighting and heavy rains. On May 16, 2013 a new small bladder pump was installed and well was sampled.

Locations Not Sampled/Reason: 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
2612		Equipment Blank	Surface water	LGS 921
2489	CER #1 Black Sulphur	Duplicate	Groundwater	LGS 922

RIN Number Assigned: Samples were assigned to RIN 13055301.

Sample Shipment: Samples were shipped overnight FedEx from Grand Junction, Colorado, to GEL Laboratories in Charleston, SC., on May 21, 2013.

Water Level Measurements: Water levels are presented in the following table.

Site Code	Well ID	Date	Time	DTW (ft)	Comments
RBL01	RB-W-01	5/14/2013	1454	18.59	Peristaltic.
RBL01	RB-D-03	5/14/2013	1519	4.4	Peristaltic.
RBL01	RB-S-03	5/14/2013	1404	39.6	Dedicated bladder pump.
RBL01	RB-D-01	5/16/3013	1030	56.45	Dedicated bladder pump & drop tube.

DTW = Depth to Water (all measurements obtained from north top of casing)
Ft = Feet
ID = Identification

The water level measurements were recorded in FDCS and uploaded to SEE-Pro database

Well Inspection Summary: All wells sampled were in good condition.

Institutional Controls:

Fences, Gates, Locks: None.
Signs: None
Trespassing/Site Disturbances: N/A

Site Issues:

Disposal Cell/Drainage Structure Integrity: N/A
Vegetation/Noxious Weed Concerns: N/A
Maintenance Requirements: Well RB-D-01 needs a larger bladder pump (~300ml) installed.
Access Issues: None
Safety Issues: None.

A 5-year deficiency-based inspection of all real property assets in compliance with DOE Order 430.1B was conducted concurrently with the annual sampling trip. No maintenance or deferred maintenance needs of real property assets were identified.

Monitoring Wells –The visible portions of all wells were in good condition, and no maintenance or deferred maintenance needs were identified for these real property assets.

Site Marker – DOE owns a permanent site marker on the property. It consists of a brass plaque mounted on a concrete base. No maintenance or deferred maintenance needs were identified for this real property asset.

(DS/lcg)

cc: (electronic)
Art Kleinrath, DOE
Steve Donivan, Stoller
Rick Findlay, Stoller
Bev Gallagher, Stoller
Rex Hodges, Stoller
Rick Hutton, Stoller
EDD Delivery