

Data Validation Package

May 2009
Groundwater and Surface Water
Sampling at the
Rio Blanco, Colorado, Site

February 2014



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Sampling Event Summary

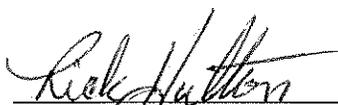
Site: Rio Blanco, Colorado, Site

Sampling Period: May 13-14, 2009

Annual sampling was conducted at the Rio Blanco, Colorado, site for the Long-Term Hydrologic Monitoring Program (LTHMP) on May 13-14, 2009, to monitor groundwater and surface water for potential radionuclide contamination. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351, continually updated). A duplicate sample was collected from location RB-S-03. Samples were analyzed by the U.S. Environmental Protection Agency (EPA) Radiation & Indoor Environments National Laboratory in Las Vegas, Nevada. Samples were analyzed for gamma-emitting radionuclides by high-resolution gamma spectroscopy, and for tritium using the conventional and enrichment methods. 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.

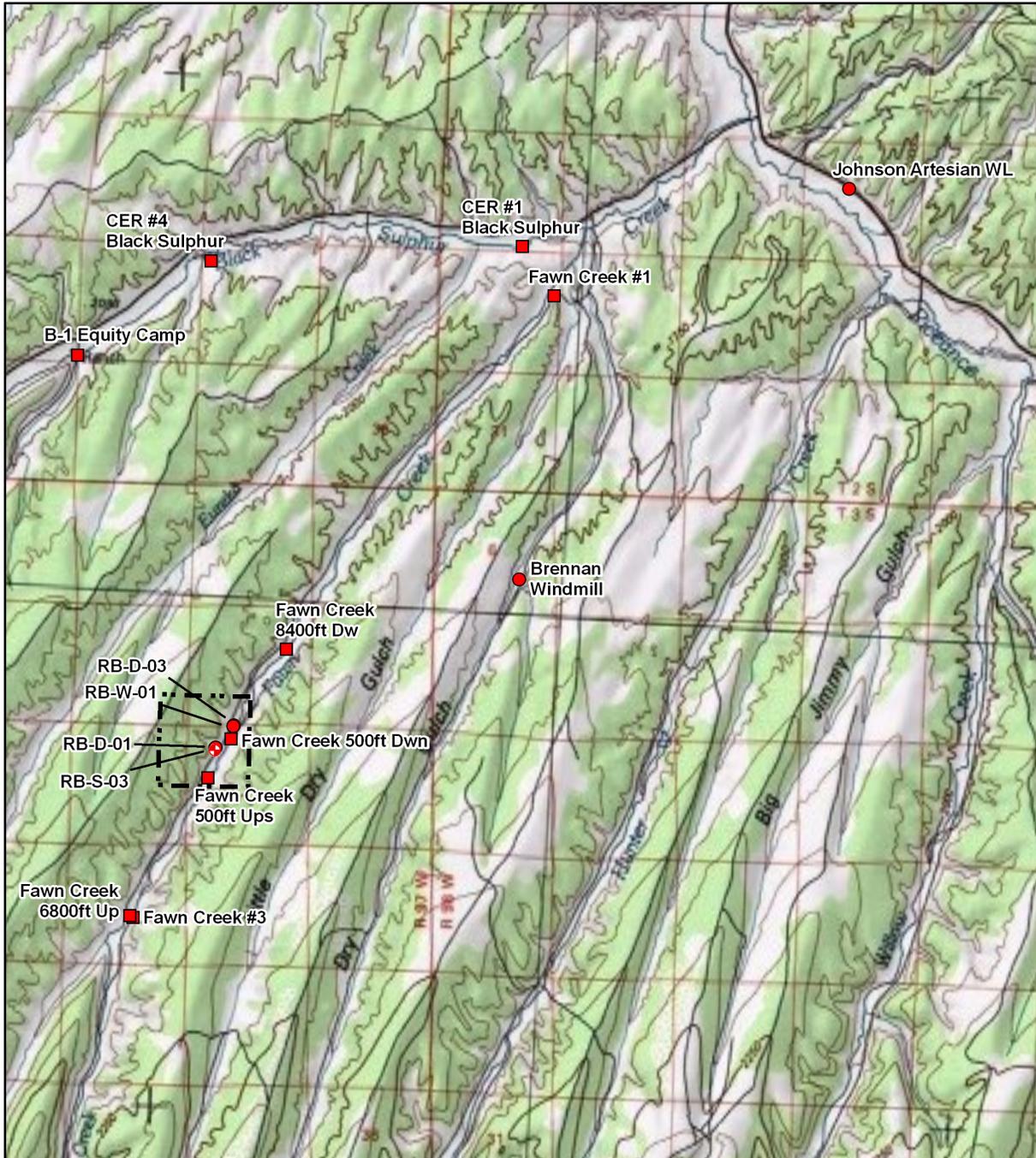
Two sampling locations, CER #1 Black Sulphur and B-1 Equity Camp, yielded a reportable value of tritium activity, using the electrolytic enrichment tritium analysis method, with values of 14.8 and 18.6 picocuries per liter (pCi/L) respectively. The time-concentration graph for tritium concentrations for these locations, obtained using the enrichment method, show declining concentrations. Conventional tritium analysis for these and all other locations resulted in no detectable activity. These results are consistent with background levels for tritium, well below the EPA drinking water standard for tritium of 20,000 pCi/L.

All high-resolution gamma spectrometry results for gamma-emitting radionuclides were below detection limits. The results from this sampling event indicate that groundwater and surface water supplies in the area have not been impacted by detonation-related contaminants.



Rick Hutton
Site Lead, S.M. Stoller Corporation

2-25-14
Date



LEGEND Surface Ground Zero Well Sample Location Surface Sample Location Site Boundary	 SCALE IN FEET 4,000 2,000 0 4,000	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>
		LTHMP Sampling Locations Rio Blanco, CO, Site	

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Sampling Locations, Rio Blanco, Colorado, Site

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Rio Blanco, Colorado	Date(s) of Water Sampling	May 13-14, 2009
Date(s) of Verification	July 27, 2009	Name of Verifier	Steve Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions.	Yes	Work Order Letter dated April 2, 2009.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on May 11, 2009.
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	Yes	
	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the category of the well documented?	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 stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

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 from location RB-S-03.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	An equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	Location ID 2612 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 (FDSC) report?	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. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDSC)?	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?	NA	Sample chilling was not required.
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Requisition No. (RIN): 09052276
Sample Event: May 13-14, 2009
Site(s): Rio Blanco Site
Laboratory: Radiation and Indoor Environments National Laboratory
Las Vegas, NV
Analysis: Radiochemistry
Validator: Steve Donovan
Review Date: July 13, 2009

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325) "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 1, Data Deliverables Examination. 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	RQA-302	RQA-302
Tritium	LSC-A-001	RQA-604	RQA-604
Tritium (enriched)	LMR-15	RQA-602	RQA-602

Data Qualifier Summary

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

Table 2. Data Qualifier Summary

Sample	Location	Analyte	Flag	Reason
All	All	Tritium	U (Not Detected)	Less than the Minimum Detectable Concentration
735320	RB-D-01	Tritium, enriched	U (Not Detected)	Less than the Minimum Detectable Concentration
735321	RB-S-03	Tritium, enriched	U (Not Detected)	Less than the Minimum Detectable Concentration
735322	RB-W-01	Tritium, enriched	U (Not Detected)	Less than the Minimum Detectable Concentration
735325	RB-S-03 Duplicate	Tritium, enriched	U (Not Detected)	Less than the Minimum Detectable Concentration

Sample Shipping/Receiving

The Radiation and Indoor Environments National Laboratory in Las Vegas, Nevada, received 16 water samples on May 19, 2009, submitted for the determination of gamma emitting nuclides, tritium, and tritium (enrichment method). The analytical report was checked to confirm that all of the samples scheduled were received and analyzed.

Preservation and Holding Times

The sample shipment was received intact with all samples in the correct container types preserved correctly for the requested analyses with the following exception. The sample bottle submitted for tritium, enrichment method, was broken in transit for sample CER #1 Black Sulphur. Tritium analysis was not performed on this sample using the enrichment method. All samples were analyzed within the applicable holding times.

Laboratory Instrument Calibration

Data for this RIN were reported at Analysis Service Level B (results only) and do not include calibration data.

Radiochemical Analysis

Radiochemical results are qualified with a “J” flag (estimated) when the result is greater than the minimum detectable concentration (MDC), but less than 3 times the MDC. Radiochemical results are qualified with a “U” flag (not detected) when the result is greater than the MDC, but less than the two sigma total propagated uncertainty.

Completeness

The electronic data deliverable (EDD) was the only deliverable received for this RIN. Cesium-137 was the only gamma emitting nuclide for which a result was reported.

EDD File

The EDD file arrived on July 10, 2009. 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.

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 a “F” flag in the database indicating the wells were purged and sampled using the low-flow sampling method. Data from well RB-W-01 are further qualified with a “Q” flag because this well was categorized as Category II due to water level draw-down. 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. An equipment blank was not collected during this sampling event.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. A duplicate sample was collected from location RB-S-01. There were no analytes detected in the sample or its duplicate.

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 Donovan
Steve Donovan

2-21-2014
Date

Data Validation Lead:

Steve Donovan
Steve Donovan

2-21-2014
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.

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: 7/27/2009

Location: Brennan Windmill WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/14/2009	N001	0	-	0	0	U		#	4.68	0
Oxidation Reduction Potential	mV	05/14/2009	N001	0	-	0	193			#		
pH	s.u.	05/14/2009	N001	0	-	0	7.8			#		
Specific Conductance	umhos /cm	05/14/2009	N001	0	-	0	1975			#		
Temperature	C	05/14/2009	N001	0	-	0	14.6			#		
Tritium	pCi/L	05/14/2009	N001	0	-	0	19.5		U	#	151	92.2
Turbidity	NTU	05/14/2009	N001	0	-	0	9.71			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: Johnson Artesian WL WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/13/2009	N001	0	-	0	0	U		#	4.74	0
Oxidation Reduction Potential	mV	05/13/2009	N001	0	-	0	150			#		
pH	s.u.	05/13/2009	N001	0	-	0	8.07			#		
Specific Conductance	umhos /cm	05/13/2009	N001	0	-	0	2240			#		
Temperature	C	05/13/2009	N001	0	-	0	16.2			#		
Tritium	pCi/L	05/13/2009	N001	0	-	0	6.5		U	#	151	91.9
Turbidity	NTU	05/13/2009	N001	0	-	0	2.98			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: RB-D-01 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/14/2009	N001	16628.77 - 16628.77	0	U	F	#	4.96	0
Enriched Tritium	pCi/L	05/14/2009	N001	16628.77 - 16628.77	-1.29		UF	#	4.14	2.48
Oxidation Reduction Potential	mV	05/14/2009	N001	16628.77 - 16628.77	-110		F	#		
pH	s.u.	05/14/2009	N001	16628.77 - 16628.77	7.5		F	#		
Specific Conductance	umhos/cm	05/14/2009	N001	16628.77 - 16628.77	28900		F	#		
Temperature	C	05/14/2009	N001	16628.77 - 16628.77	17.4		F	#		
Tritium	pCi/L	05/14/2009	N001	16628.77 - 16628.77	-74.7		UF	#	151	90
Turbidity	NTU	05/14/2009	N001	16628.77 - 16628.77	2.39		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: RB-D-03 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/13/2009	N001	0	-	0	0	U	F	#	4.99	0
Oxidation Reduction Potential	mV	05/13/2009	N001	0	-	0	135		F	#		
pH	s.u.	05/13/2009	N001	0	-	0	8.55		F	#		
Specific Conductance	umhos /cm	05/13/2009	N001	0	-	0	850		F	#		
Temperature	C	05/13/2009	N001	0	-	0	9.6		F	#		
Tritium	pCi/L	05/13/2009	N001	0	-	0	-74.7		UF	#	151	90
Turbidity	NTU	05/13/2009	N001	0	-	0	7.46		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: RB-S-03 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/14/2009	N001	16628.75 - 16628.75	0	U	F	#	4.97	0
Cesium-137	pCi/L	05/14/2009	N002	16628.75 - 16628.75	0	U	F	#	4.89	0
Enriched Tritium	pCi/L	05/14/2009	N001	16628.75 - 16628.75	1.39		UF	#	4.44	2.73
Enriched Tritium	pCi/L	05/14/2009	N002	16628.75 - 16628.75	-0.836		UF	#	3.65	2.2
Oxidation Reduction Potential	mV	05/14/2009	N001	16628.75 - 16628.75	-47		F	#		
pH	s.u.	05/14/2009	N001	16628.75 - 16628.75	7.86		F	#		
Specific Conductance	umhos/cm	05/14/2009	N001	16628.75 - 16628.75	860		F	#		
Temperature	C	05/14/2009	N001	16628.75 - 16628.75	12.7		F	#		
Tritium	pCi/L	05/14/2009	N001	16628.75 - 16628.75	78		UF	#	151	93.6
Tritium	pCi/L	05/14/2009	N002	16628.75 - 16628.75	-19.5		UF	#	151	91.3
Turbidity	NTU	05/14/2009	N001	16628.75 - 16628.75	3.34		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: RB-W-01 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers		Detection Limit	Uncertainty
									Data	QA		
Cesium-137	pCi/L	05/13/2009	N001	0	-	0	0	U	FQ	#	4.48	0
Enriched Tritium	pCi/L	05/13/2009	N001	0	-	0	1.62		UFQ	#	3.72	2.29
Oxidation Reduction Potential	mV	05/13/2009	N001	0	-	0	138		FQ	#		
pH	s.u.	05/13/2009	N001	0	-	0	8.12		FQ	#		
Specific Conductance	umhos/cm	05/13/2009	N001	0	-	0	1440		FQ	#		
Temperature	C	05/13/2009	N001	0	-	0	10.4		FQ	#		
Tritium	pCi/L	05/13/2009	N001	0	-	0	19.5		UFQ	#	151	92.2
Turbidity	NTU	05/13/2009	N001	0	-	0	33.9		FQ	#		

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: 7/27/2009

Location: B-1 Equity Camp SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/14/2009	N001	0	U		#	4.97	0
Enriched Tritium	pCi/L	05/14/2009	N001	18.6			#	4.14	2.91
Oxidation Reduction Potential	mV	05/14/2009	N001	75			#		
pH	s.u.	05/14/2009	N001	7.32			#		
Specific Conductance	umhos/cm	05/14/2009	N001	1080			#		
Temperature	C	05/14/2009	N001	9.2			#		
Tritium	pCi/L	05/14/2009	N001	-52		U	#	151	90.5
Turbidity	NTU	05/14/2009	N001	1.67			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: CER #1 Black Sulphur SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/14/2009	N001	0	U		#	4.84	0
Enriched Tritium	pCi/L	05/14/2009	N001	14.8			#	3.71	2.57
Oxidation Reduction Potential	mV	05/14/2009	N001	98			#		
pH	s.u.	05/14/2009	N001	7.29			#		
Specific Conductance	umhos/cm	05/14/2009	N001	1450			#		
Temperature	C	05/14/2009	N001	9.7			#		
Tritium	pCi/L	05/14/2009	N001	6.5		U	#	151	91.9
Turbidity	NTU	05/14/2009	N001	1.32			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: CER #4 Black Sulphur SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/14/2009	N001	0	U		#	4.95	0
Oxidation Reduction Potential	mV	05/14/2009	N001	98			#		
pH	s.u.	05/14/2009	N001	7.27			#		
Specific Conductance	umhos/cm	05/14/2009	N001	1370			#		
Temperature	C	05/14/2009	N001	9.5			#		
Tritium	pCi/L	05/14/2009	N001	-42.2		U	#	151	90.7
Turbidity	NTU	05/14/2009	N001	1.77			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: Fawn Creek #1 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/14/2009	N001	0	U		#	4.98	0
Oxidation Reduction Potential	mV	05/14/2009	N001	62			#		
pH	s.u.	05/14/2009	N001	7.27			#		
Specific Conductance	umhos/cm	05/14/2009	N001	1590			#		
Temperature	C	05/14/2009	N001	11.5			#		
Tritium	pCi/L	05/14/2009	N001	48.7		U	#	151	92.9
Turbidity	NTU	05/14/2009	N001	2.49			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: Fawn Creek #3 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/13/2009	N001	0	U		#	4.98	0
Oxidation Reduction Potential	mV	05/13/2009	N001	188			#		
pH	s.u.	05/13/2009	N001	6.94			#		
Specific Conductance	umhos/cm	05/13/2009	N001	1360			#		
Temperature	C	05/13/2009	N001	8.7			#		
Tritium	pCi/L	05/13/2009	N001	84.5		U	#	151	93.7
Turbidity	NTU	05/13/2009	N001	1.9			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: Fawn Creek 500ft Dwn SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/13/2009	0001	0	U		#	4.71	0
Oxidation Reduction Potential	mV	05/13/2009	N001	170			#		
pH	s.u.	05/13/2009	N001	8.02			#		
Specific Conductance	umhos/cm	05/13/2009	N001	1255			#		
Temperature	C	05/13/2009	N001	17.2			#		
Tritium	pCi/L	05/13/2009	0001	-19.5		U	#	151	91.3
Turbidity	NTU	05/13/2009	N001	42.7			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: Fawn Creek 500ft Ups SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/13/2009	0001	0	U		#	4.35	0
Oxidation Reduction Potential	mV	05/13/2009	N001	180			#		
pH	s.u.	05/13/2009	N001	8.07			#		
Specific Conductance	umhos/cm	05/13/2009	N001	1240			#		
Temperature	C	05/13/2009	N001	17.1			#		
Tritium	pCi/L	05/13/2009	0001	-9.75		U	#	151	91.5
Turbidity	NTU	05/13/2009	N001	23.4			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: Fawn Creek 6800ft Up SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/13/2009	0001	0	U		#	4.96	0
Oxidation Reduction Potential	mV	05/13/2009	N001	144			#		
pH	s.u.	05/13/2009	N001	8.53			#		
Specific Conductance	umhos/cm	05/13/2009	N001	1040			#		
Temperature	C	05/13/2009	N001	15.3			#		
Tritium	pCi/L	05/13/2009	0001	3.25		U	#	151	91.8
Turbidity	NTU	05/13/2009	N001	91.8			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RBL01, Rio Blanco Site

REPORT DATE: 7/27/2009

Location: Fawn Creek 8400ft Dw SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Cesium-137	pCi/L	05/14/2009	0001	0	U	#	4.62	0
Oxidation Reduction Potential	mV	05/14/2009	N001	115		#		
pH	s.u.	05/14/2009	N001	8.07		#		
Specific Conductance	umhos/cm	05/14/2009	N001	1260		#		
Temperature	C	05/14/2009	N001	11.7		#		
Tritium	pCi/L	05/14/2009	0001	-13	U	#	151	91.4
Turbidity	NTU	05/14/2009	N001	55.3		#		

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:

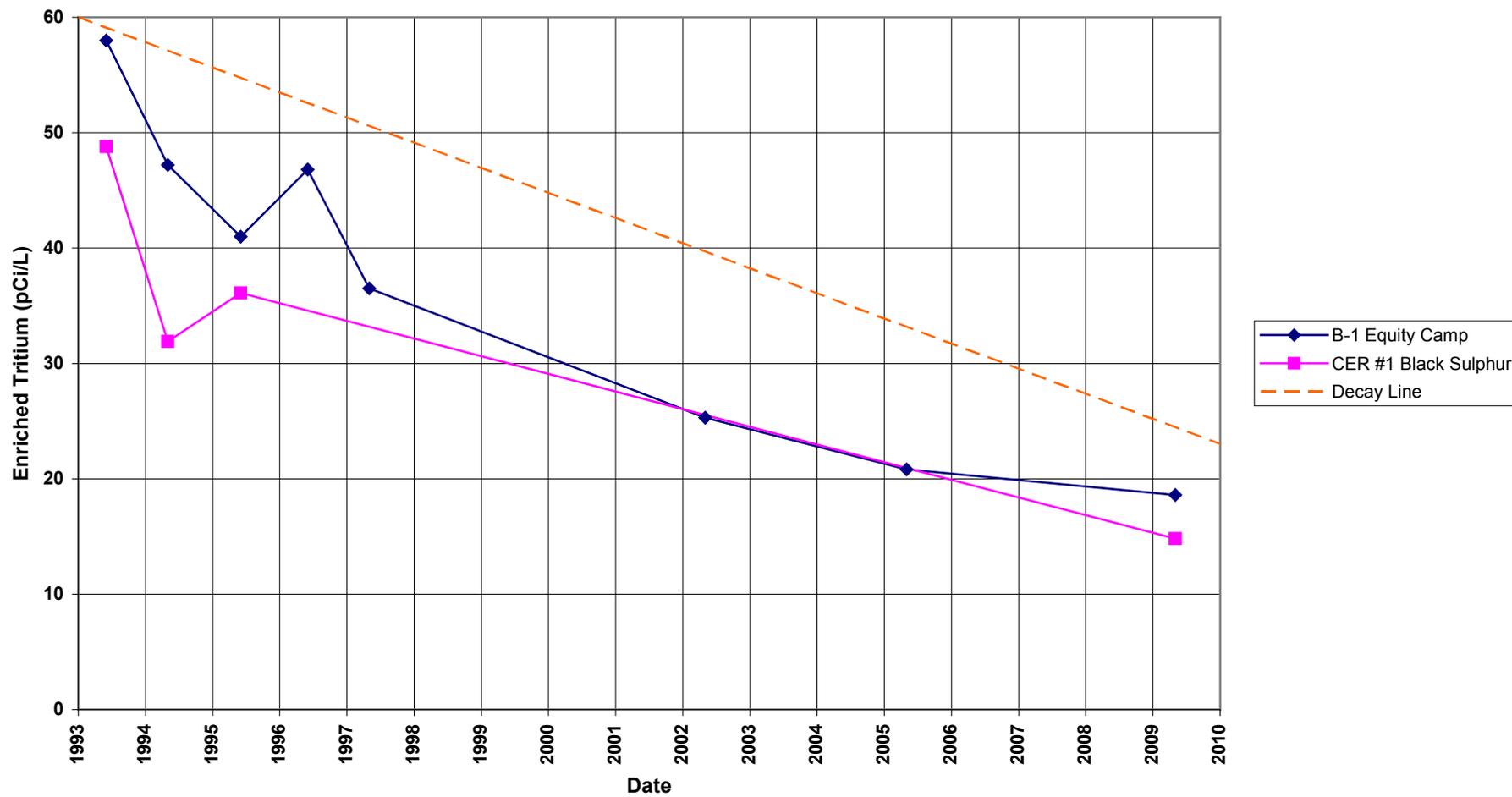
- # Validated according to quality assurance guidelines

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Time-Concentration Graphs

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Rio Blanco Site
Tritium Concentration (Enrichment Method)



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Attachment 3
Sampling and Analysis Work Order

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established 1959

Task Order LM00-502
Control Number 09-0665

April 2, 2009

U.S. Department of Energy
Office of Legacy Management/MS
ATTN: Jack Craig
3600 Collins Ferry Rd.
Morgantown, WV 26505

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
May 2009 Environmental Sampling at the Rio Blanco, Colorado, Site

Reference: Task Order LM00-502-07-618-402, Rio Blanco, CO, Site

Dear Mr. Craig:

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 monitor wells, a municipal water supply well, and surface locations at this site as part of the routine environmental sampling scheduled to begin the week of May 11, 2009.

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

Monitor 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

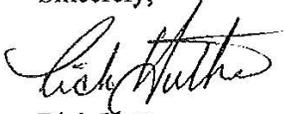
B-1 Equity Camp CER #1 Black Sulphur CER #4 Black Sulphur Fawn Creek #1
Fawn Creek #3 Fawn Creek 6800ft Up Fawn Creek 8400ft Dw

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.

Jack Craig
Control Number 09-0665
Page 2

If you have any questions, please call me at (970) 248-6477 or Rick Findlay at (970) 248-6419.

Sincerely,



Rick Hutton
Site lead

RH/lcg/lb

Enclosures (3)

cc: (electronic)

Cheri Bahrke, Stoller
Steve Donovan, Stoller
Jack Duray, Stoller
Rick Findlay, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction

Constituent Sampling Breakdown

Site	Rio Blanco		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Approx. No. Samples/yr	6	9			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential					
pH	X	X			
Specific Conductance	X	X			
Turbidity					
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					
Strontium					
Sulfate					
Sulfide					
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 analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

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Attachment 4 Trip Report

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Memorandum

Control Number N/A

DATE: May 21, 2009
 TO: Rick Hutton
 FROM: Jeff Price
 SUBJECT: Trip Report (LTHMP Sampling)

Site: Rio Blanco, CO

Dates of Sampling Event: May 13-14, 2009

Team Members: Kent Moe and Jeff Price.

Number of Locations Sampled: 2 on-site wells, 4 private wells, and 9 surface locations.

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	RB-S-03	Duplicate	Groundwater	HGY 268

RIN Number Assigned: Samples were assigned to RIN 09052276 (EPA Lab).

Sample Shipment: Samples were shipped on May 18, 2009.

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

Site Code	Well ID	Date	Time	DTW (ft)	Comments
RBL01	RB-W-01	5/13/2009	14:45	18.07	Peristaltic.
RBL01	RB-D-03	5/13/2009	14:30	4.29	Peristaltic.
RBL01	RB-S-03	5/14/2009	13:30	39.76	Dedicated bladder pump.
RBL01	RB-D-01	5/14/2009	08:00	56.49	Dedicated bladder pump & drop tube.

DTW = Depth to Water (all measurements obtained from north top of casing)

Ft = Feet

ID = Identification

Introduction

Stoller personnel Kent Moe and Jeff Price drove from the Grand Junction office to the Rio

Blanco site and began sampling on May 13. The sampling crew, accompanied by Mark Plessinger, returned on May 14 and completed the sampling. Results from last year's sampling effort were given to property owners Johnson, Brennan, and Vaughn.

Sample Locations

RB-D-01 (On-site well)	B-1 Equity Camp (Surface Location)
RB-S-03 (On-site well)	CER #1 Black Sulphur (Surface Location)
RB-D-03 (Private well)	CER #4 Black Sulphur (Surface Location)
RB-W-01 (Private well)	Fawn Creek #1 (Surface Location)
Johnson Artesian Well (Private well)	Fawn Creek #3 (Surface Location)
Brennan Windmill (Private well)	Fawn Creek 6800ft Up (Surface Location)
Fawn Creek 500ft Dwn (Surface Location)	Fawn Creek 8400ft Dw (Surface Location)
Fawn Creek 500ft Ups (Surface Location)	

All locations were analyzed for tritium and gamma spec; a select set of locations were analyzed for enriched tritium. All samples were submitted for analysis by the EPA lab in Las Vegas. A duplicate sample was collected from well RB-S-03 (sample identified as 2612). Copies of the sample collection logs and chain of custody documentation are maintained at the Grand Junction office.

(JP/lcg)

cc: Jack Craig, DOE
Cheri Bahrke, Stoller
Steve Donovan, Stoller
Jack Duray, Stoller
Rick Findlay, Stoller
Rex Hodges, Stoller
Mark Plessinger, Stoller
EDD Delivery