

Data Validation Package

May 2010
Groundwater and Surface Water
Sampling at the Rulison, Colorado, Site

December 2010



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

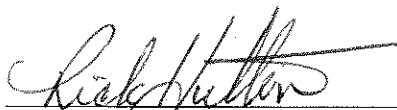
Site: Rulison, Colorado, Site

Sampling Period: May 10-11, 2010

Annual sampling was conducted at the Rulison, Colorado, site for the Long-Term Hydrologic Monitoring Program (LTHMP) on May 10-11, 2010, to monitor groundwater and surface water for potential radionuclide contamination. Sampling and analysis was conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. (LMS/PLN/S04351, continually updated). A duplicate sample was collected from location Patrick McCarty. 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 Rulison Site demonstrate that groundwater and surface water outside the site boundaries have not been affected by project-related contaminants.

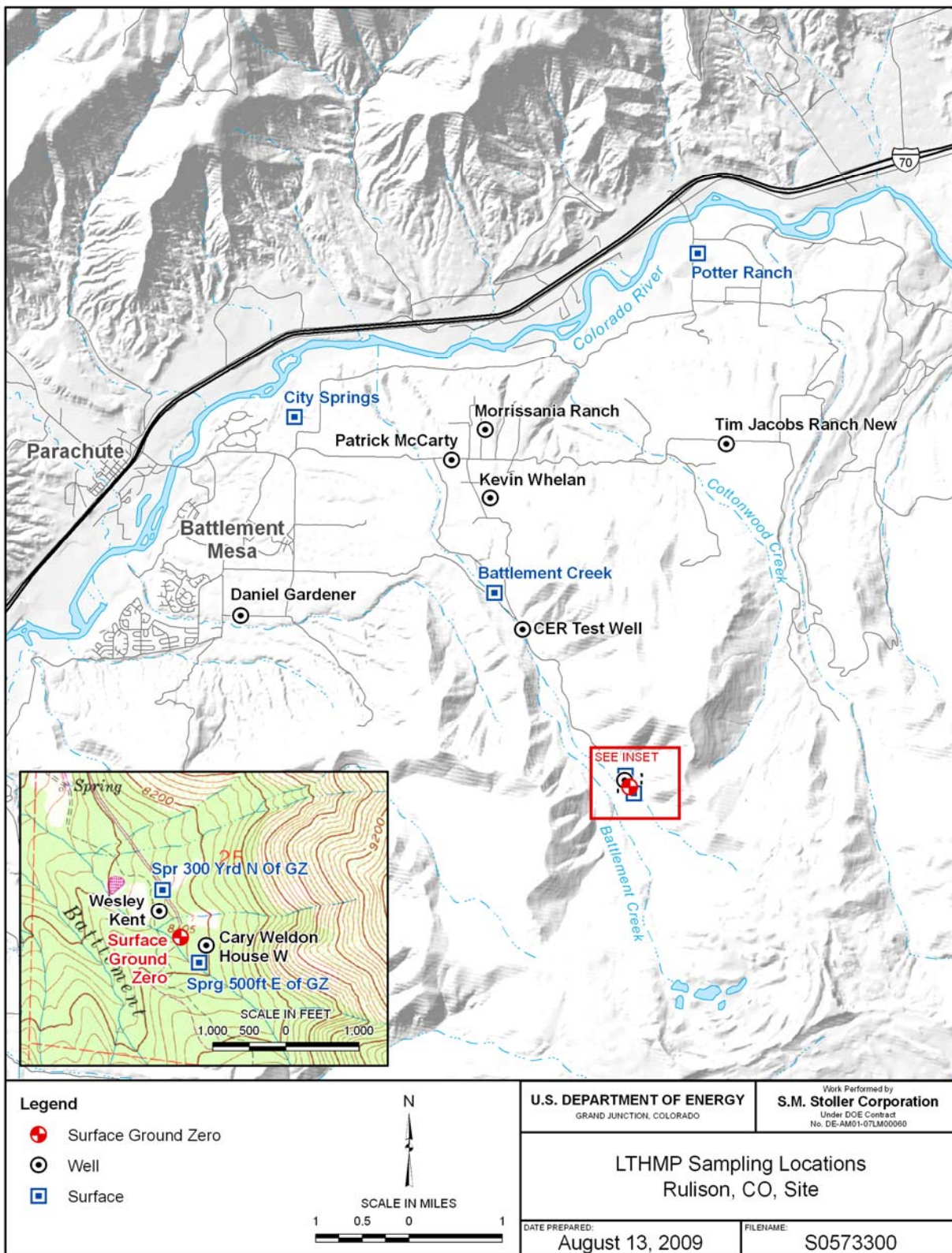
Four sampling locations yielded a reportable value of tritium activity using either the conventional or the electrolytic enrichment tritium analysis method. The values ranged from 22.9 to 156 picocuries per liter (pCi/L). These results are consistent with background levels for tritium, well below the EPA drinking water standard for tritium of 20,000 pCi/L. The time-concentration graph for tritium concentrations obtained using the enrichment method show declining concentrations.

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

10/27/10
Date



Water Sampling Locations at the Rulison, Colorado, Site

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	<u>Rulison, Colorado</u>	Date(s) of Water Sampling	<u>May 10–11, 2010</u>
Date(s) of Verification	<u>November 24, 2010</u>	Name of Verifier	<u>Steve Donovan</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions.	<u>Yes</u>	<u>Work Order Letter dated April 5, 2010.</u>
2. Were the sampling locations specified in the planning documents sampled?	<u>No</u>	<u>Locations “Spr 300 Yrd N of GZ” and “Spr 500 ft E of GZ” were not sampled because of access denial by the land owner.</u>
3. Was a pre-trip calibration conducted as specified in the above-named documents?	<u>Yes</u>	<u>Pre-trip calibration was performed on May 5, 2010.</u>
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	<u>Yes</u> <u>Yes</u>	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	<u>Yes</u>	
6. Was the category of the well documented?	<u>Yes</u>	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling? Was the flow rate less than 500 mL/min? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	<u>NA</u> <u>NA</u> <u>NA</u> <u>NA</u>	<u>There were no Category I wells.</u>

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	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 Patrick McCarty.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	An equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	Location ID 2611 was used for the duplicate sample.
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	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): 10053037
 Sample Event: May 10–11, 2010
 Site(s): Rulison, Colorado, Site
 Laboratory: Radiation and Indoor Environments National Laboratory
 Las Vegas, NV
 Analysis: Radiochemistry
 Validator: Steve Donovan
 Review Date: November 24, 2010

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), “Standard Practice for Validation of Laboratory Data.” The procedure was applied at Level 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
735495	Patrick McCarty	Tritium	U	Less than the Decision Level Concentration
735496	Morrissania Ranch	Tritium	U	Less than the Decision Level Concentration
735497	Daniel Gardener	Potassium-40	U	Less than the Decision Level Concentration
735497	Daniel Gardener	Lead-212	U	Less than the Decision Level Concentration
735497	Daniel Gardener	Tritium	J	Less than the Determination Limit
735499	City Springs	Thallium-208	U	Less than the Decision Level Concentration
735499	City Springs	Tritium	U	Less than the Decision Level Concentration
735500	Tim Jacobs Ranch New	Tritium	U	Less than the Decision Level Concentration
735501	Battlement Creek	Tritium	U	Less than the Decision Level Concentration
735502	CER Test Well	Tritium	U	Less than the Decision Level Concentration
735503	Patrick McCarty duplicate	Tritium	U	Less than the Decision Level Concentration
735504	Potter Ranch	Tritium	U	Less than the Decision Level Concentration
735505	Kevin Whelan	Tritium	U	Less than the Decision Level Concentration

Sample Shipping/Receiving

The Radiation and Indoor Environments National Laboratory in Las Vegas, Nevada, received 10 water samples on May 20, 2010, 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. 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 Determination Limit (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 Decision Level Concentration estimated as 3 times the one sigma total propagated uncertainty.

Completeness

The electronic data deliverable was the only deliverable received for this RIN.

Electronic Data Deliverable (EDD) File

The EDD file arrived on October 27, 2010. 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.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 10053037 Lab Code: RIE Validator: Steve Donovan Validation Date: 11/24/2010
Project: Rulison Site Analysis Type: Metals General Chem Rad Organics
of Samples: 10 Matrix: WATER Requested Analysis Completed: Yes

Chain of Custody

Present: OK Signed: OK Dated: OK

Sample

Integrity: OK Preservation: OK Temperature: OK

Select Quality Parameters

- Holding Times
- Detection Limits
- Field/Trip Blanks
- Field Duplicates

All analyses were completed within the applicable holding times.

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

There was 1 duplicate evaluated.

Sampling Quality Control Assessment

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

Sampling Protocol

Location CER Test Well was sampled using a dedicated bladder pump. Data from this Category II well are qualified with an “FQ” flag in the database indicating the well was purged and sampled using the low-flow sampling method. 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 required for 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 Patrick McCarty. The radiochemical relative error ratio (calculated using the one-sigma total propagated uncertainty) was less than three for all duplicates, indicating acceptable precision.

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

RIN: 10053037 Lab Code: RIE Project: Rulison Site Validation Date: 11/24/2010

Duplicate: 2611

Sample: Patrick McCarty

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Cs-137	0.00E+00	U	0.00E+00	1	0.00E+00	U	0.00E+00	1			pCi/L
H-3	4.30E+01		8.99E+01	1	1.19E+02		9.17E+01	1		1.2	pCi/L

Certification

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

Laboratory Coordinator: Steve Donivan 12-23-2010
Steve Donivan Date

Data Validation Lead: Steve Donivan 12-23-2010
Steve Donivan 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 RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: CER Test Well WELL CER Test Well

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/10/2010	N001	0	-	0	0	U	FQ	#	2.3	0
Enriched Tritium	pCi/L	05/10/2010	N001	0	-	0	25.6		FQ	#	3.75	2.83
Oxidation Reduction Potential	mV	05/10/2010	N001	0	-	0	-60		FQ	#		
pH	s.u.	05/10/2010	N001	0	-	0	7.96		FQ	#		
Specific Conductance	umhos/cm	05/10/2010	N001	0	-	0	383		FQ	#		
Temperature	C	05/10/2010	N001	0	-	0	11.73		FQ	#		
Tritium	pCi/L	05/10/2010	N001	0	-	0	13.2		UFQ	#	146	89.1
Turbidity	NTU	05/10/2010	N001	0	-	0	19.5		FQ	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: Daniel Gardener WELL A Gardner Ranch loc 40 ft to Sou

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/10/2010	N001	0	-	0	0	U		#	2.3	0
Lead-212	pCi/L	05/10/2010	N001	0	-	0	2.17		U	#	0	2.7
Oxidation Reduction Potential	mV	05/10/2010	N001	0	-	0	8.8			#		
pH	s.u.	05/10/2010	N001	0	-	0	7.58			#		
Potassium-40	pCi/L	05/10/2010	N001	0	-	0	8.41		U	#	0	12
Specific Conductance	umhos /cm	05/10/2010	N001	0	-	0	845			#		
Temperature	C	05/10/2010	N001	0	-	0	12.09			#		
Tritium	pCi/L	05/10/2010	N001	0	-	0	156		J	#	146	92.6
Turbidity	NTU	05/10/2010	N001	0	-	0	3.04			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: Kevin Whelan WELL Whelan Ranch Loc

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/10/2010	N001	0	-	0	0	U		#	2.1	0
Oxidation Reduction Potential	mV	05/10/2010	N001	0	-	0	23.8			#		
pH	s.u.	05/10/2010	N001	0	-	0	7.85			#		
Specific Conductance	umhos/cm	05/10/2010	N001	0	-	0	844			#		
Temperature	C	05/10/2010	N001	0	-	0	11.32			#		
Tritium	pCi/L	05/10/2010	N001	0	-	0	26.5		U	#	146	89.5
Turbidity	NTU	05/10/2010	N001	0	-	0	2.45			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: Morrissania Ranch WELL Formerly Glen Schwab Ranch/Robert Searcy Ranch; Sauter Douglas; Rothgery, Wayne an Debra; Douglas K. Sauter AP

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/10/2010	N001	16512 - 16512	0	U		#	2.3	0
Enriched Tritium	pCi/L	05/10/2010	N001	16512 - 16512	22.9			#	4.02	2.95
Oxidation Reduction Potential	mV	05/10/2010	N001	16512 - 16512	52.2			#		
pH	s.u.	05/10/2010	N001	16512 - 16512	8.02			#		
Specific Conductance	umhos/cm	05/10/2010	N001	16512 - 16512	517			#		
Temperature	C	05/10/2010	N001	16512 - 16512	9.54			#		
Tritium	pCi/L	05/10/2010	N001	16512 - 16512	19.9		U	#	146	89.3
Turbidity	NTU	05/10/2010	N001	16512 - 16512	3.14			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: Patrick McCarty WELL McCarty Genetics 100 ft South (

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/10/2010	N001	0	-	0	0	U		#	2.3	0
Cesium-137	pCi/L	05/10/2010	N002	0	-	0	0	U		#	2.6	0
Enriched Tritium	pCi/L	05/10/2010	N001	0	-	0	32.4			#	3.5	2.81
Oxidation Reduction Potential	mV	05/10/2010	N001	0	-	0	18.3			#		
pH	s.u.	05/10/2010	N001	0	-	0	8.01			#		
Specific Conductance	umhos/cm	05/10/2010	N001	0	-	0	684			#		
Temperature	C	05/10/2010	N001	0	-	0	11.42			#		
Tritium	pCi/L	05/10/2010	N001	0	-	0	43		U	#	146	89.9
Tritium	pCi/L	05/10/2010	N002	0	-	0	119		U	#	146	91.7
Turbidity	NTU	05/10/2010	N001	0	-	0	1.84			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: Tim Jacobs Ranch New WELL Jacobs Residence loc is 100 ft S

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID			Lab	Data QA		
Cesium-137	pCi/L	05/10/2010	N001	0 - 0	0	U	#	2.2	0
Oxidation Reduction Potential	mV	05/10/2010	N001	0 - 0	49.2		#		
pH	s.u.	05/10/2010	N001	0 - 0	8.07		#		
Specific Conductance	umhos /cm	05/10/2010	N001	0 - 0	395		#		
Temperature	C	05/10/2010	N001	0 - 0	10.43		#		
Tritium	pCi/L	05/10/2010	N001	0 - 0	92.7		U #	146	91.1
Turbidity	NTU	05/10/2010	N001	0 - 0	1.68		#		

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.

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 RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: Battlement Creek SURFACE LOCATION Battlement Creek Loc.

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Cesium-137	pCi/L	05/10/2010	N001	0	U	#	2.2	0	
Oxidation Reduction Potential	mV	05/10/2010	N001	22.4		#			
pH	s.u.	05/10/2010	N001	8.18		#			
Specific Conductance	umhos/cm	05/10/2010	N001	233		#			
Temperature	C	05/10/2010	N001	7.79		#			
Tritium	pCi/L	05/10/2010	N001	26.5	U	#	146	89.5	
Turbidity	NTU	05/10/2010	N001	7.58		#			

Surface Water Quality Data by Location (USEE102) FOR SITE RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: City Springs SURFACE LOCATION Parachute Springs Loc in Bldg

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Cesium-137	pCi/L	05/11/2010	N001	0	U		#	2.5	0
Oxidation Reduction Potential	mV	05/11/2010	N001	399.8			#		
pH	s.u.	05/11/2010	N001	7.63			#		
Specific Conductance	umhos/cm	05/11/2010	N001	549			#		
Temperature	C	05/11/2010	N001	14.33			#		
Thallium-208	pCi/L	05/11/2010	N001	1.12		U	#	0	1.3
Tritium	pCi/L	05/11/2010	N001	89.3		U	#	146	91
Turbidity	NTU	05/11/2010	N001	1.4			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RUL01, Rulison Site

REPORT DATE: 12/8/2010

Location: Potter Ranch SURFACE LOCATION Potter Ranch loc is 100 ft E

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Cesium-137	pCi/L	05/10/2010	N001	0	U	#	2.3	0
pH	s.u.	05/10/2010	N001	7.69		#		
Specific Conductance	umhos/cm	05/10/2010	N001	549		#		
Temperature	C	05/10/2010	N001	12.13		#		
Tritium	pCi/L	05/10/2010	N001	103	U	#	146	91.3
Turbidity	NTU	05/10/2010	N001	1.61		#		

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

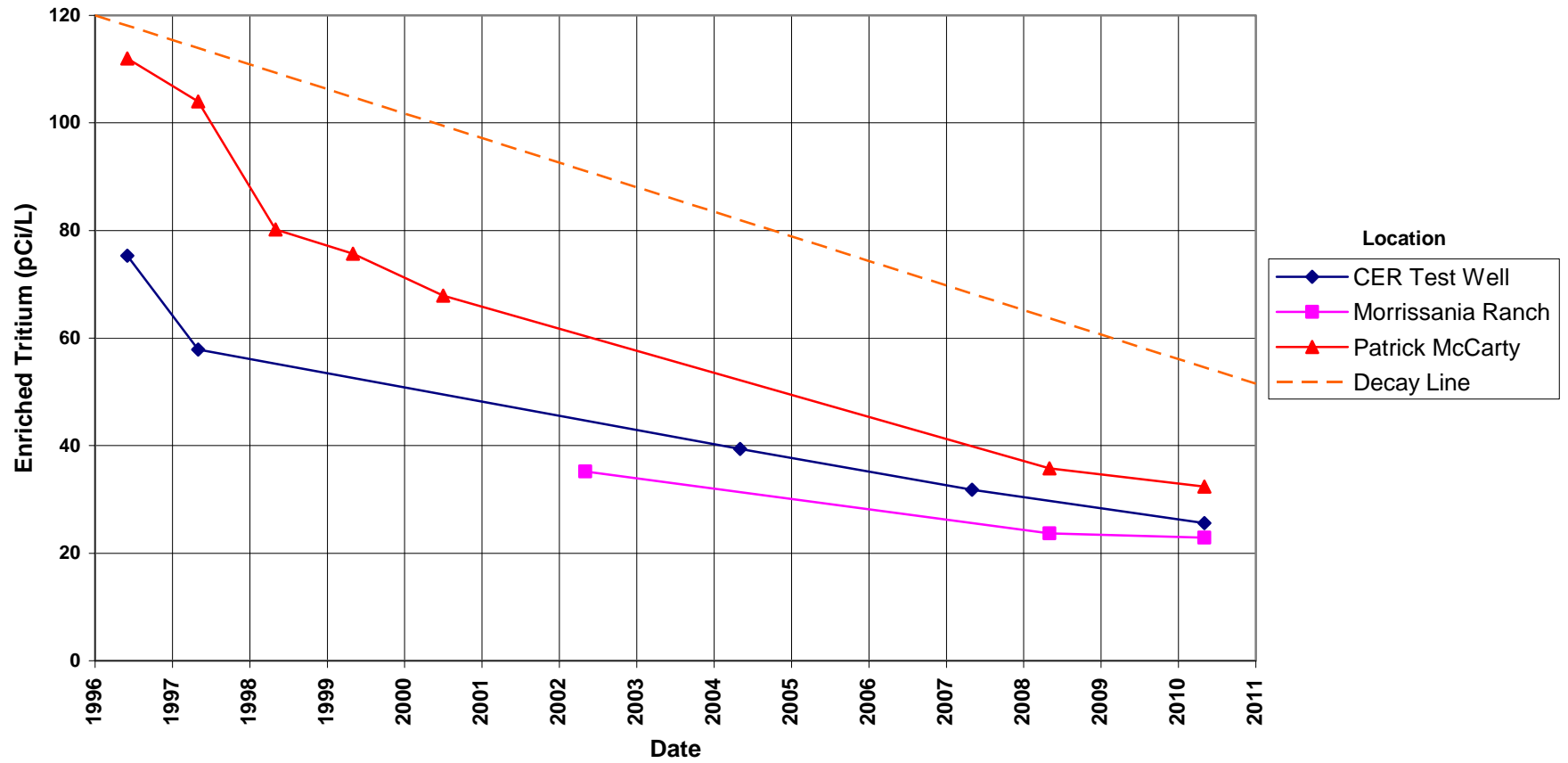
- # Validated according to quality assurance guidelines.

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Time-Concentration Graph

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Rulison Site Enriched Tritium Concentration



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Attachment 3
Sampling and Analysis Work Order

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April 5, 2010

U.S. Department of Energy
ATTN: Jack Craig
99 Research Road
Morgantown, WV 26505

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
May 2010 Environmental Sampling at Rulison, Colorado

Reference: Task Order LM00-502-07-619-402, Rulison Site

Dear Mr. Craig:

The purpose of this letter is to inform you of the upcoming sampling event at Rulison, Colorado. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Rulison site. Water quality data will be collected from monitoring 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 10, 2010.

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

Monitor Wells

Off-Site

CER Test Well	Daniel Gardener	Kevin Whelan	Morrissania Ranch
Patrick McCarty	Tim Jacobs Ranch New		

Municipal Water Supply

City Springs

Surface Water

On-Site

Spr 300 Yrd N of GZ	Sprg 500ft E of GZ
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Off-Site

Battlement Creek	Potter Ranch
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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 10-0506
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 Manager

RH/lcg/dc

Enclosures (3)

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

Sampling Frequencies for Locations at Rulison, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
Off-Site						
CER Test Well			X			
Daniel Gardener			X			
Kevin Whelan			X			
Morrissania Ranch			X			
Patrick McCarty			X			
Tim Jacobs Ranch New			X			
On-Site						
Cary Weldon House W			X			
Wesley Kent House W			X			
Municipal Water Supply						
City Springs			X			
Surface Locations						
On-Site						
Spr 300 Yrd N Of GZ			X			
Sprg 500ft E of GZ			X			
Off-Site						
Battlement Creek			X			
Potter Ranch			X			

Sampling conducted in May

Constituent Sampling Breakdown

Site	Rulison		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Approx. No. Samples/yr	9	4			
<i>Field Measurements</i>					
Alkalinity					
Dissolved Oxygen					
Redox Potential					
pH	X	X			
Specific Conductance	X	X			
Turbidity					
Temperature	X	X			
<i>Laboratory Measurements</i>					
Aluminum					
Ammonia as N (NH3-N)					
Calcium					
Chloride					
Chromium					
Gamma Spec	X	X	10 pCi/L	Gamma Spectrometry	GAM-A-001
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium					
Radium-226					
Radium-228					
Selenium					
Silica					
Sodium					
Strontium					
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.

Attachment 4

Trip Report

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Memorandum

Control Number N/A

DATE: May 18, 2010
 TO: Rick Hutton
 FROM: Jeff Price
 SUBJECT: Trip Report (LTHMP Sampling)

Site: Rulison, CO

Dates of Sampling Event: May 10–11, 2010

Team Members: Dan Sellers and Jeff Price.

Number of Locations Sampled: 6 wells and 3 seeps/springs.

Locations Not Sampled/Reason: Springs 300 yards north of ground zero and 500 feet east of ground zero were sampled because of access denial by the land owner.

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
2611	Patrick McCarty	Duplicate	Groundwater	IGS 593

RIN Number Assigned: Samples for were assigned to RIN 10053037 (EPA Lab).

Sample Shipment: Samples were shipped on May 17, 2010.

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

Site Code	Well ID	Date	Time	DTW (ft)	Comments
RUL01	CER Test Well	5/10/2010	11:50	32.13	

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

Ft = Feet

ID = Identification

Trip Summary

Stoller personnel Dan Sellers and Jeff Price drove from the Grand Junction office and began sampling at the Rulison site on Monday, May 10, and completed the sampling the next day. All locations, with the exception of the City Springs site, were sampled on Monday. The City Springs location was sampled Tuesday morning.

Sample Locations

CER Test (private well)
Daniel Gardener (private well)
Kevin Whelan (private well)
Morrissania Ranch (private well)
Patrick McCarty (private well)
Tim Jacobs Ranch New (private well)
City Springs (spring)
Battlement Creek (creek)
Potter Ranch (spring)

All samples were analyzed for tritium and gamma spec; a select set of locations were analyzed for enriched tritium. Samples were submitted to the EPA lab in Las Vegas. A duplicate sample was collected from the Patrick McCarty well (sample identified as 2611). Copies of the sample collection logs and chain of custody documentation are maintained at the Grand Junction office.

(JP/lcg)

cc: (electronic)
Jack Craig, DOE
Cheri Bahrke, Stoller
Steve Donovan, Stoller
Jack Duray, Stoller
Rick Findlay, Stoller
Rex Hodges, Stoller
EDD Delivery