Data Validation Package

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

February 2014

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Rulison, Colorado, Site

Sampling Period: May 11-12, 2009

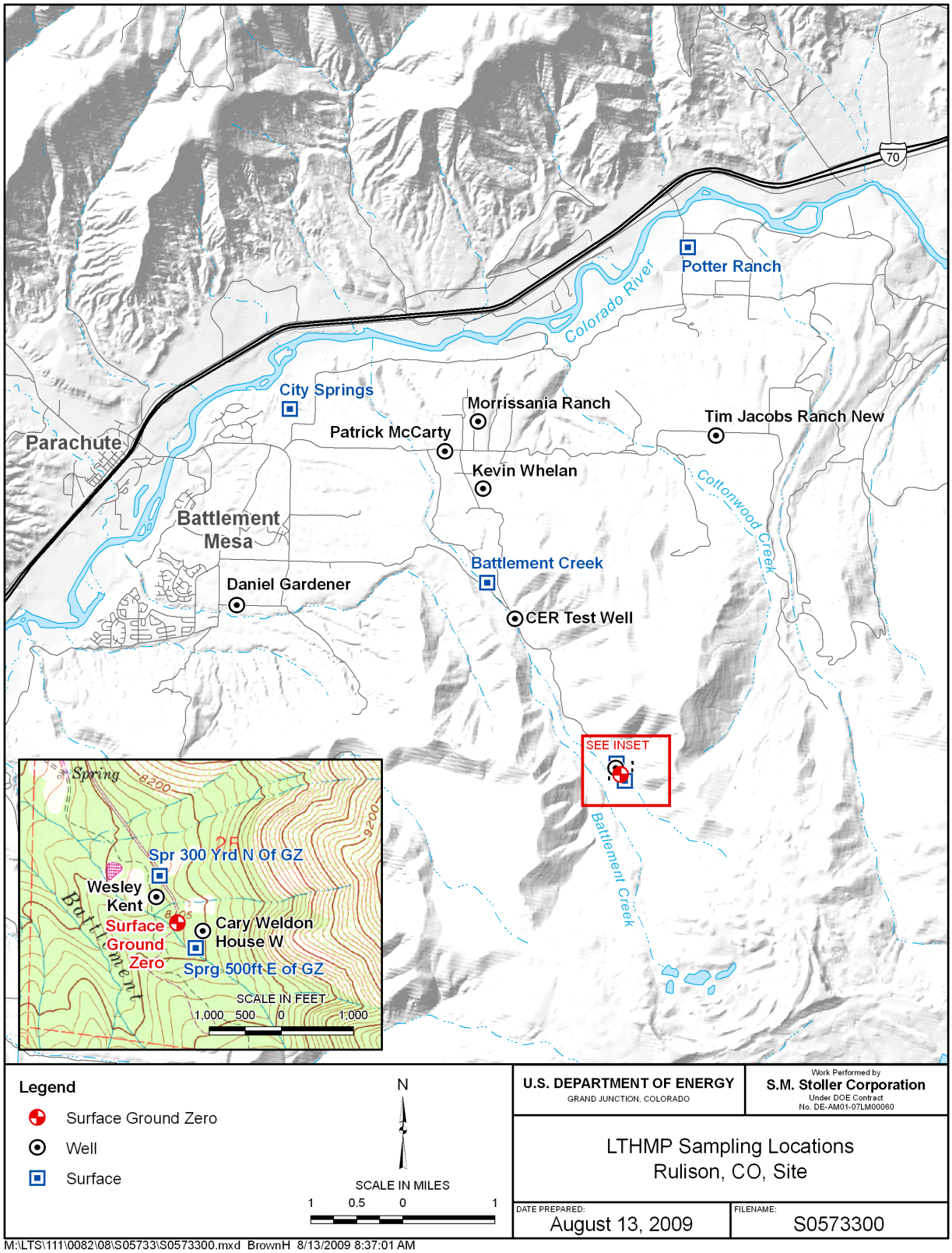
Annual sampling was conducted at the Rulison, Colorado, site for the Long-Term Hydrologic Monitoring Program (LTHMP) on May 11-12, 2009, to monitor groundwater and surface water for potential radionuclide contamination. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351, continually updated). A duplicate sample was collected from location Spr 300 Yrd N Of GZ. 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.

Three sampling locations yielded a reportable value of tritium activity using the electrolytic enrichment tritium analysis method. The values ranged from 19.7 to 25.8 picocuries per liter (pCi/L). 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. 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

2-25-14
Date



Water Sampling Locations at the Rulison, Colorado, Site

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Rulison, Colorado	**Date(s) of Water Sampling**	May 11-12, 2009
Date(s) of Verification	July 24, 2009	**Name of Verifier**	Steve Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work Order Letter dated April 2, 2009.
2. Were the sampling locations specified in the planning documents sampled?	Yes	Additional samples were collected from Cary Weldon and Wesley Kent wells.
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?	Yes	An operational check was performed on May 12, 2009.
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. 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?	No	Water level stability criteria was not met in well CER Test Well.
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?	NA	There were no Category II wells sampled.
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected from Spr 300 Yrd N Of GZ.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	
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 cooling 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):	09052275
Sample Event:	May 11-12, 2009
Site(s):	Rulison, Colorado, Site
Laboratory:	Radiation and Indoor Environments National Laboratory Las Vegas, NV
Analysis:	Radiochemistry
Validator:	Steve Donivan
Review Date:	July 13, 2009

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 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

Sample Shipping/Receiving

The Radiation and Indoor Environments National Laboratory in Las Vegas, Nevada, received 14 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. 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

Well CER Test Well was sampled using a dedicated bladder pump. Data from this Category I well are qualified with an "F" 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 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 Spr 300 Yrd N of GZ. 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 Donivan — Date: 2-21-2014

Data Validation Lead: Steve Donivan — Date: 2-21-2014

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: 7/24/2009
Location: CER Test Well WELL CER Test Well

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	-	0	0	U	F	#	4.97	0
Oxidation Reduction Potential	mV	05/12/2009	N001	0	-	0	-172		F	#		
pH	s.u.	05/12/2009	N001	0	-	0	7.5		F	#		
Specific Conductance	umhos /cm	05/12/2009	N001	0	-	0	360		F	#		
Temperature	C	05/12/2009	N001	0	-	0	9.5		F	#		
Tritium	pCi/L	05/12/2009	N001	0	-	0	-35.7		UF	#	159	95.7
Turbidity	NTU	05/12/2009	N001	0	-	0	9.77		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Cary Weldon House W WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	-	0	0	U		#	5	0
Oxidation Reduction Potential	mV	05/12/2009	N001	0	-	0	28			#		
pH	s.u.	05/12/2009	N001	0	-	0	7.56			#		
Specific Conductance	umhos /cm	05/12/2009	N001	0	-	0	630			#		
Temperature	C	05/12/2009	N001	0	-	0	10.3			#		
Tritium	pCi/L	05/12/2009	N001	0	-	0	-9.73		U	#	159	96.3
Turbidity	NTU	05/12/2009	N001	0	-	0	4.48			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Daniel Gardener WELL A Gardner Ranch loc 40 ft to Sou

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	-	0	0	U		#	4.95	0
Enriched Tritium	pCi/L	05/12/2009	N001	0	-	0	25.2			#	3.77	2.81
Oxidation Reduction Potential	mV	05/12/2009	N001	0	-	0	96			#		
pH	s.u.	05/12/2009	N001	0	-	0	7.14			#		
Specific Conductance	umhos /cm	05/12/2009	N001	0	-	0	806			#		
Temperature	C	05/12/2009	N001	0	-	0	14			#		
Tritium	pCi/L	05/12/2009	N001	0	-	0	45.4		U	#	159	97.5
Turbidity	NTU	05/12/2009	N001	0	-	0	4.07			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Kevin Whelan WELL Whelan Ranch Loc

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	-	0	0	U		#	4.96	0
Oxidation Reduction Potential	mV	05/12/2009	N001	0	-	0	112			#		
pH	s.u.	05/12/2009	N001	0	-	0	7.32			#		
Specific Conductance	umhos /cm	05/12/2009	N001	0	-	0	780			#		
Temperature	C	05/12/2009	N001	0	-	0	12.5			#		
Tritium	pCi/L	05/12/2009	N001	0	-	0	-81.1		U	#	159	94.7
Turbidity	NTU	05/12/2009	N001	0	-	0	2.25			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Morrissania Ranch WELL Formerly Douglas K. Sauter Ap

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	16512	-	16512	0	U		#	4.99	0
Oxidation Reduction Potential	mV	05/12/2009	N001	16512	-	16512	105			#		
pH	s.u.	05/12/2009	N001	16512	-	16512	7.62			#		
Specific Conductance	umhos /cm	05/12/2009	N001	16512	-	16512	483			#		
Temperature	C	05/12/2009	N001	16512	-	16512	10.5			#		
Tritium	pCi/L	05/12/2009	N001	16512	-	16512	-16.2		U	#	159	96.1
Turbidity	NTU	05/12/2009	N001	16512	-	16512	2.79			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Patrick McCarty WELL McCartey Genetics 100 ft South

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	-	0	0	U		#	4.94	0
Oxidation Reduction Potential	mV	05/12/2009	N001	0	-	0	114			#		
pH	s.u.	05/12/2009	N001	0	-	0	7.56			#		
Specific Conductance	umhos /cm	05/12/2009	N001	0	-	0	655			#		
Temperature	C	05/12/2009	N001	0	-	0	11.9			#		
Tritium	pCi/L	05/12/2009	N001	0	-	0	25.9		U	#	159	97.1
Turbidity	NTU	05/12/2009	N001	0	-	0	1.99			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Tim Jacobs Ranch New WELL Jacobs Residence loc is 100 ft S

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	-	0	0	U		#	4.9	0
Enriched Tritium	pCi/L	05/12/2009	N001	0	-	0	25.8			#	3.74	2.8
Oxidation Reduction Potential	mV	05/12/2009	N001	0	-	0	100			#		
pH	s.u.	05/12/2009	N001	0	-	0	7.47			#		
Specific Conductance	umhos /cm	05/12/2009	N001	0	-	0	363			#		
Temperature	C	05/12/2009	N001	0	-	0	13.2			#		
Tritium	pCi/L	05/12/2009	N001	0	-	0	6.49		U	#	159	96.7
Turbidity	NTU	05/12/2009	N001	0	-	0	3.35			#		

Groundwater Quality Data by Location (USEE100) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Wesley Kent House W WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	-	0	0	U		#	4.71	0
Oxidation Reduction Potential	mV	05/12/2009	N001	0	-	0	40			#		
pH	s.u.	05/12/2009	N001	0	-	0	6.94			#		
Specific Conductance	umhos /cm	05/12/2009	N001	0	-	0	645			#		
Temperature	C	05/12/2009	N001	0	-	0	6.4			#		
Tritium	pCi/L	05/12/2009	N001	0	-	0	-25.9		U	#	159	95.9
Turbidity	NTU	05/12/2009	N001	0	-	0	2.91			#		

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 RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Battlement Creek SURFACE LOCATION Battlement Creek Loc.

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	0001	0	U		#	4.94	0
Oxidation Reduction Potential	mV	05/12/2009	N001	80			#		
pH	s.u.	05/12/2009	N001	7.88			#		
Specific Conductance	umhos/cm	05/12/2009	N001	160			#		
Temperature	C	05/12/2009	N001	9.2			#		
Tritium	pCi/L	05/12/2009	0001	-22.7		U	#	159	96
Turbidity	NTU	05/12/2009	N001	20.2			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: City Springs SURFACE LOCATION Parachute Springs Loc in Bldg

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/11/2009	N001	0	U		#	4.98	0
Oxidation Reduction Potential	mV	05/11/2009	N001	194			#		
pH	s.u.	05/11/2009	N001	6.97			#		
Specific Conductance	umhos/cm	05/11/2009	N001	533			#		
Temperature	C	05/11/2009	N001	13.9			#		
Tritium	pCi/L	05/11/2009	N001	29.2		U	#	159	97.2
Turbidity	NTU	05/11/2009	N001	1.19			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Potter Ranch SURFACE LOCATION Potter Ranch loc is 100 ft E

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	U		#	4.94	0
Oxidation Reduction Potential	mV	05/12/2009	N001	112			#		
pH	s.u.	05/12/2009	N001	7.54			#		
Specific Conductance	umhos/cm	05/12/2009	N001	540			#		
Temperature	C	05/12/2009	N001	15.22			#		
Tritium	pCi/L	05/12/2009	N001	16.2		U	#	159	96.9
Turbidity	NTU	05/12/2009	N001	3.35			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Spr 300 Yrd N Of GZ SURFACE LOCATION 500 Ft. East Spring loc (ERROR)

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	U		#	4.88	0
Cesium-137	pCi/L	05/12/2009	N002	0	U		#	4.89	0
Enriched Tritium	pCi/L	05/12/2009	N001	19.7			#	3.89	2.77
Enriched Tritium	pCi/L	05/12/2009	N002	19.2			#	3.78	2.7
Oxidation Reduction Potential	mV	05/12/2009	N001	-5			#		
pH	s.u.	05/12/2009	N001	7.27			#		
Specific Conductance	umhos/cm	05/12/2009	N001	665			#		
Temperature	C	05/12/2009	N001	7.6			#		
Tritium	pCi/L	05/12/2009	N001	3.24		U	#	159	96.6
Tritium	pCi/L	05/12/2009	N002	16.2		U	#	159	96.9
Turbidity	NTU	05/12/2009	N001	6.56			#		

Surface Water Quality Data by Location (USEE102) FOR SITE RUL01, Rulison Site
REPORT DATE: 7/24/2009
Location: Sprg 500ft E of GZ SURFACE LOCATION Weldon Creek Loc 15 ft to South

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Cesium-137	pCi/L	05/12/2009	N001	0	U		#	4.67	0
Oxidation Reduction Potential	mV	05/12/2009	N001	65			#		
pH	s.u.	05/12/2009	N001	7.6			#		
Specific Conductance	umhos/cm	05/12/2009	N001	615			#		
Temperature	C	05/12/2009	N001	7.9			#		
Tritium	pCi/L	05/12/2009	N001	22.7		U	#	159	97
Turbidity	NTU	05/12/2009	N001	4.45			#		

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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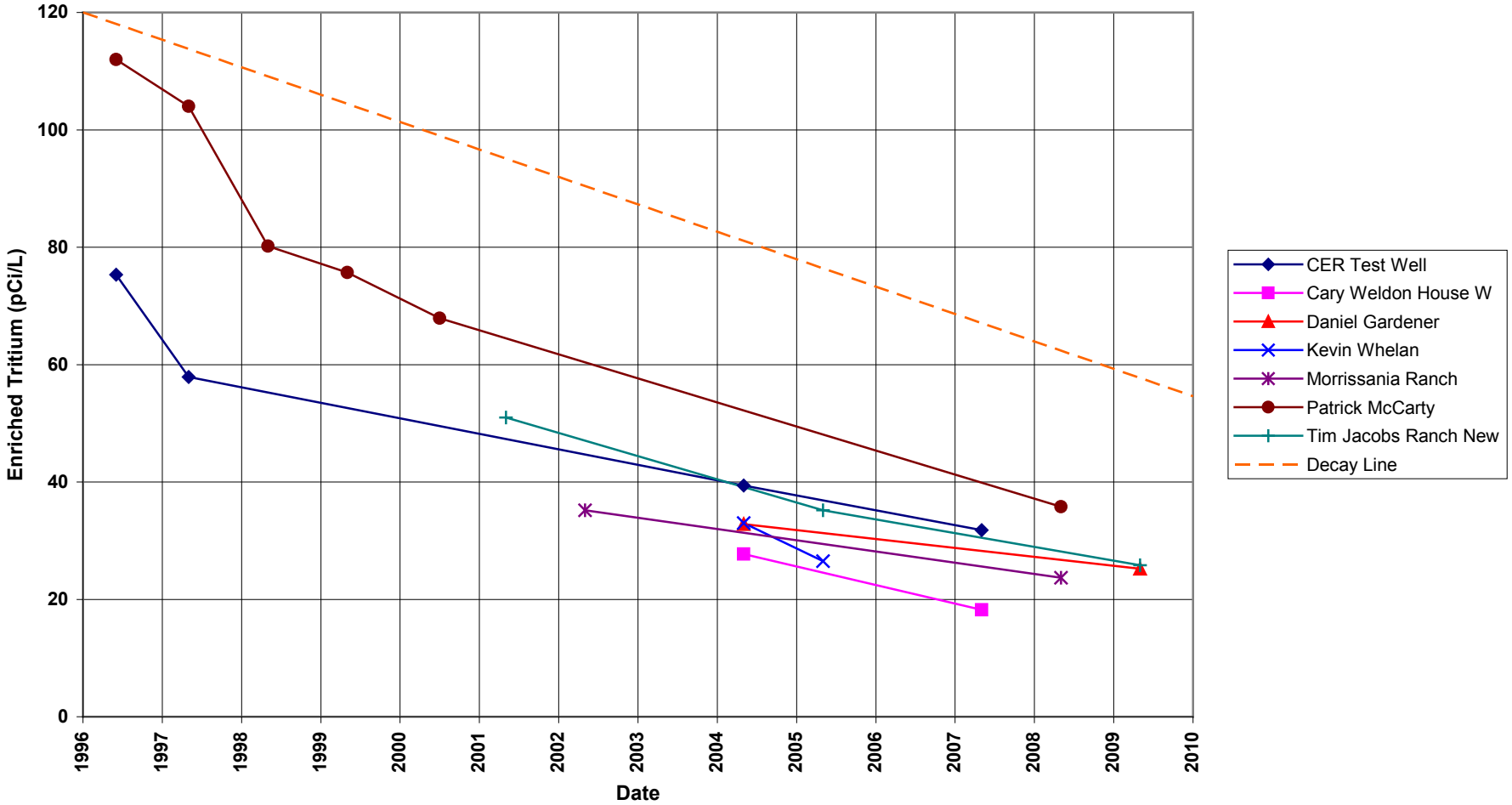
Rulison Site
Tritium Concentration (Enrichment Method)



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Attachment 3
Sampling and Analysis Work Order

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Task Order LM00-502
Control Number 09-0664

April 2, 2009

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

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

REFERENCE: Task Order LM00-502-07-619-402, Rulison, CO, 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 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
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

Off-Site

Battlement Creek	Potter Ranch

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.

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 Donivan, Stoller
Jack Duray, Stoller
Rick Findlay, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction

Constituent Sampling Breakdown

Site	Rulison				
Analyte	**Groundwater**	**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	7	4			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential					
pH	X	X			
Specific Conductance	X	X			
Turbidity					
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH_3-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					
Nickel-63					
Nitrate + Nitrite as N (NO_3+NO_2)-N					
Potassium					
Radium-226					
Radium-228					
Selenium					
Silica					
Sodium					
Strontium					
Sulfate					
Sulfide					
Total Dissolved Solids					
Total Organic Carbon					
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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Stoller
Grand Junction Office
established 1959

Memorandum

Control Number N/A

DATE: May 18, 2009

TO: Rick Hutton

FROM: Jeff Price

SUBJECT: Trip Report (LTHMP Sampling)

Site: Rulison, CO

Dates of Sampling Event: May 11-12, 2009

Team Members: Kent Moe and Jeff Price.

Number of Locations Sampled: 8 wells and 5 seeps/springs.

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
2611	Spr 300 Yrd N Of GZ	Duplicate	Seep/Spring	HGY-245

RIN Number Assigned: Samples for were assigned to RIN 09052275 (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
RUL01	CER Test Well	5/12/2009	09:45	31.06	

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 and began sampling at the Rulison site on Monday, May 12. Because of a late start to the field on Monday, there was only enough time to collect a sample from the Parachute City Springs; the remaining locations were sampled the next day. Copies of the annual EPA report for last year's sampling results were handed to all of the Rulison property owners, with the exceptions being the Morrissania Ranch and the City of Parachute. Copies of the report were mailed to these two property owners. The property owner of the Tim Jacobs Ranch noticed that in the letter containing the sampling results from last year that DOE plans to discontinue the routine groundwater and surface water sampling at the distant locations. This property owner would prefer that the sampling of their well continue.

The Cary Weldon and Wesley Kent wells were not on the sampling list; however, after discussions with Rick Findlay and Jack Duray, the decision was made to sample these locations. Mr. Kent had questions/comments regarding the sampling effort: (1) why do we not sample for enriched tritium at his well? (2) why we do not sample two private wells below his property; one well is the 96 Ranch owned by Judy Hayward's children, the other well is owned by Randy Warren. Contact information for Judy Hayward is 970-285-9600; Randy Warren is 970-285-0139.

Sample Locations

Gary Weldon (private well)
Wesley Kent (private well)
CER Test (private well)
Daniel Gardener (private well)
Kevin Whelan (private well)
Morrissania Ranch (private well)
Patrick McCarty (private well)
Tim Jacobs (private well)
City Springs (spring)
Spr 300 Yrd N of GZ (spring)
Sprg 500ft E of GZ(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 Spr 300 Yrd N Of GZ (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 Donivan, Stoller
Jack Duray, Stoller
Rick Findlay, Stoller
Rex Hodges, Stoller
EDD Delivery