Data Validation Package

March 2014
Alternate Water Supply System Sampling at the Riverton, Wyoming, Processing Site

May 2014

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Riverton, Wyoming, Alternate Water Supply System

Sampling Period: March 11, 2014

Sampling was conducted in support of semiannual flushing of the alternate water supply system (AWSS) in accordance with the *Alternate Water Supply System Flushing Plan Riverton, Wyoming* (January 2013). Three domestic tap locations and eight hydrant locations on the AWSS were sampled. Tap location 0814 could not be sampled because the home was vacant with the pump/piping winterized. Tap location 0816 was not sampled during the sampling event because the owners were not home; however, a sample was collected at this location the next day by Wind River Environmental Quality Commission personnel. Two samples each were collected at six of the eight hydrant locations – one sample 5 minutes into the flush and one sample at the end of the flush as specified in the plan. Only end-of-flush samples were collected at hydrant locations 0834 and 0843 because of the short flushing time.

Monitoring at hydrant and tap locations is performed to determine the effectiveness of the flushing program in reducing the naturally occurring radionuclide concentrations and maintaining them at acceptable levels. The flushing program is considered successful when (1) the combined radium-226 and radium-228 concentrations are below the Federal drinking water maximum contaminant level of 5 picocuries per liter (pCi/L) and (2) the uranium concentrations at all locations are below the maximum contaminant level of 0.03 milligram per liter (mg/L) in the post-flush samples. The effectiveness of the flushing program was demonstrated, with the maximum observed combined radium-226 and radium-228 concentration of 2.0 pCi/L and maximum observed uranium concentration of 0.00011 mg/L.

Sam Campbell — 6/4/2014

Sam Campbell
Site Lead,
The S.M. Stoller Corporation,
a wholly owned subsidiary of Huntington Ingalls Industries

Date

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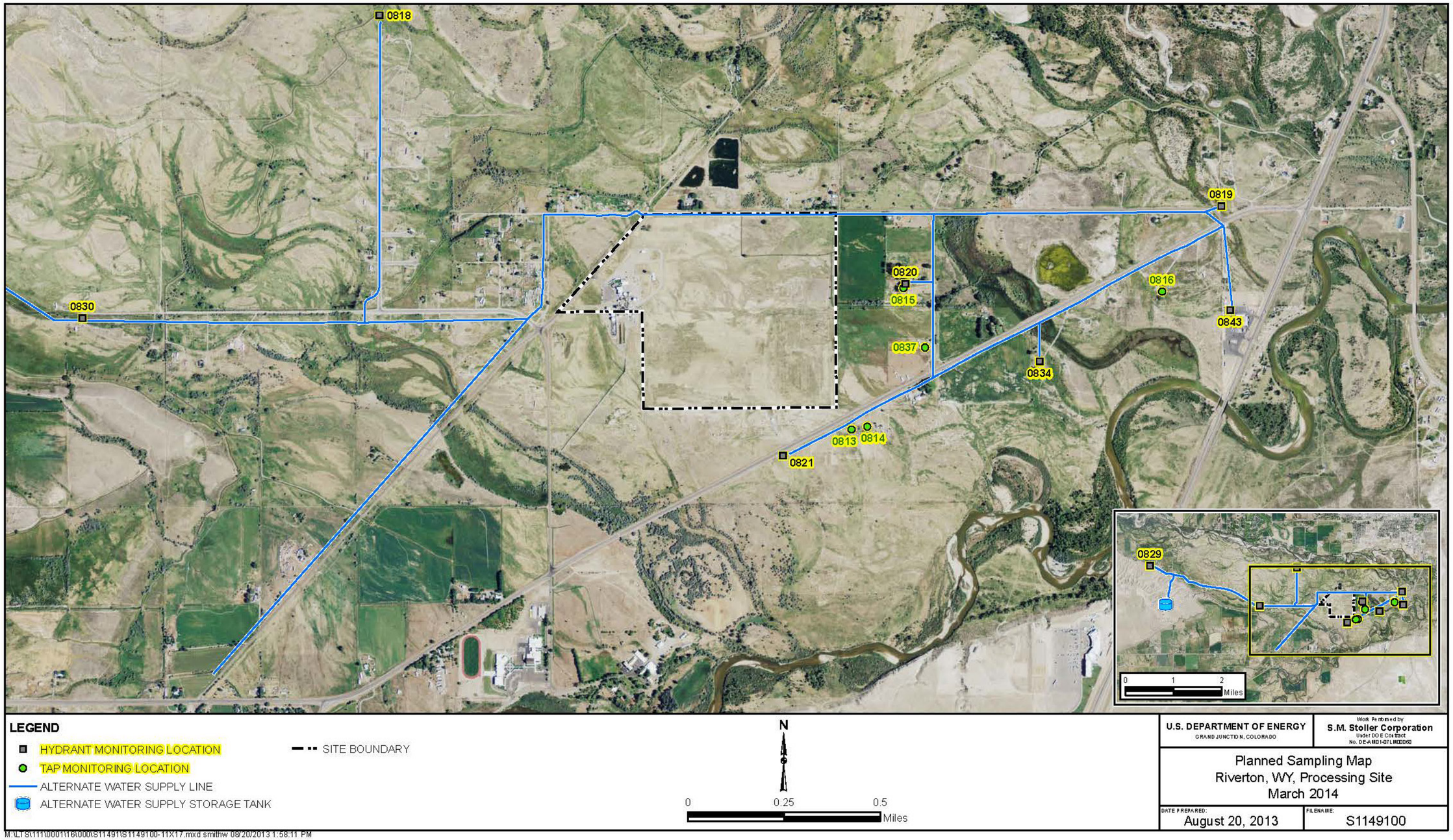

Riverton, WY, Processing Site, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Riverton, Wyoming, Processing Site	**Date(s) of Water Sampling**	March 11, 2014
Date(s) of Verification	April 29, 2014	**Name of Verifier**	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List any Program Directives or other documents, SOPs, instructions.		Alternate Water Supply System Flushing Plan Riverton, Wyoming.
2. Were the sampling locations specified in the planning documents sampled?	Yes	Domestic tap locations 0814 and 0816 were not sampled because either the home was vacant or the homeowner was not home. Only end of flush samples were collected at hydrant locations 0834 and 0843 because of the short flushing time.
3. Were calibrations conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on March 7, 2014.
4. Was an operational check of the field equipment conducted daily?	Yes	Operational checks were performed as required.
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?	No	A DO measurement is not available for the 5-minute sample at hydrant 0829 because the sensor membrane was not in place when the sample was collected. No other DO measurements were adversely affected.
6. Were wells categorized correctly?	NA	Samples were collected from domestic taps or hydrants.
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	NA	Samples were collected from domestic taps or hydrants.
Did the water level stabilize prior to sampling?	NA	Samples were collected from domestic taps or hydrants.
Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling?	NA	Samples were collected from domestic taps or hydrants.
Was the flow rate less than 500 mL/min?	NA	Samples were collected from domestic taps or hydrants.

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	Samples were collected from domestic taps or hydrants.
Was one pump/tubing volume removed prior to sampling?	NA	Samples were collected from domestic taps or hydrants.
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from location 0818 (the end-of-flush sample, ticket number MET 424).
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	Yes	Location ID 2175 was used for the duplicate sample.
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Was all pertinent information documented on the field data sheets?	Yes	
18. Was the presence or absence of ice in the cooler documented at every sample location?	NA	Sample chilling was not required.
19. Were water levels measured at the locations specified in the planning documents?	NA	

Laboratory Performance Assessment

General Information

Report Number (RIN):	14035986
Sample Event:	March 11, 2014
Project:	Riverton, Wyoming, Alternate Water Supply System Flushing
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	1403247
Analysis:	Metals and Radiochemistry
Validator:	Gretchen Baer
Review Date:	April 28, 2014

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/POL/S04325, continually updated) "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 3, Data Validation. 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
Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Radium-226	GPC-A-018	ALS SOP 712	ALS SOP 724
Radium-228	GPC-A-020	ALS SOP 749	ALS SOP 724

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 Number	Location	Analyte(s)	Flag	Reason
1403247-2	0815	Radium-226	J	Less than the determination limit
1403247-2	0815	Radium-228	J	Less than the determination limit
1403247-3	0818	Radium-228	J	Less than the determination limit
1403247-5	0819	Radium-228	J	Less than the determination limit
1403247-6	0819	Radium-226	J	Less than the determination limit
1403247-6	0819	Radium-228	J	Less than the determination limit
1403247-8	0820	Radium-228	J	Less than the determination limit
1403247-9	0821	Radium-226	J	Less than the determination limit
1403247-9	0821	Radium-228	J	Less than the determination limit
1403247-10	0821	Radium-228	J	Less than the determination limit
1403247-13	0830	Radium-228	J	Less than the determination limit
1403247-14	0830	Radium-226	J	Less than the determination limit

Table 2 (continued). Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
1403247-14	0830	Radium-228	J	Less than the determination limit
1403247-15	0834	Radium-226	J	Less than the determination limit
1403247-16	0837	Radium-228	U	Less than the decision level concentration
1403247-17	0843	Radium-228	J	Less than the determination limit
1403247-18	0818 Duplicate	Radium-228	J	Less than the determination limit
All	All	Uranium	J	Reporting limit verification not performed

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 18 water samples on March 14, 2014, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents had no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact and at ambient temperature, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for uranium as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The practical quantitation limit (PQL) for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL.

For radiochemical analytes (those measured by radiometric counting) the MDL and PQL are not applicable, and these results are evaluated using the minimum detectable concentration (MDC), Decision Level Concentration (DLC), and Determination Limit (DL). The MDC is a measure of radiochemical method performance and was calculated and reported as specified in *Quality Systems for Analytical Services*. The DLC is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, and is estimated as 3 times the one-sigma total propagated uncertainty. Results that are greater than the MDC, but less than the DLC are qualified with a "U" flag (not detected). The DL for radiochemical results is the lowest concentration that can be reliably measured, and is defined as 3 times the MDC. Results not previously "U" qualified that are less than the DL are qualified with a "J" flag as estimated values.

The reported MDLs for uranium, and MDCs for radiochemical analytes demonstrate compliance with contractual requirements.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. All calibration and laboratory spike standards were prepared from independent sources.

Method SW-846 6020, Uranium
Calibrations for uranium were performed on March 26, 2014, using four calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks met the acceptance criteria. A reporting limit verification check was not performed; associated results are qualified with a "J" flag (estimated). Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Radium-226
Instrument calibration was performed August 2013. Daily instrument checks met the acceptance criteria. The chemical recoveries met the acceptance criteria of 40 to 110 percent for all samples.

Radium-228
Instrument calibration was performed May 2013. Daily instrument checks met the acceptance criteria. The chemical recoveries met the acceptance criteria of 40 to 110 percent for all samples.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis.

Metals
All uranium method blank and calibration blank results associated with the samples were below MDL.

Radiochemistry
The radium-226 method blank results were below the DLC. Radium-228 was detected in a method blank; any associated results that were greater than the MDC and less than 5 times the blank concentration have been previously qualified.

Inductively Coupled Plasma Interference Check Sample Analysis

Interference check samples were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The spike recoveries met the acceptance criteria for all analytes evaluated.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for non-radiochemical replicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. For radiochemical measurements, the relative error ratio (the ratio of the absolute difference between the sample and duplicate results and the sum of the 1-sigma uncertainties) is used to evaluate duplicate results and should be less than 3. All replicate results met these criteria, demonstrating acceptable precision.

Laboratory Control Sample

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

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. Serial dilution data were not evaluated because all sample results were less than 50 times the MDL.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers. The analytical report included the MDL (MDC for radiochemistry) and PQL for all analytes and all required supporting documentation.

Electronic Data Deliverable (EDD) File

The EDD file was received on April 1, 2014. The Sample Management System EDD validation module was used to verify that the EDD files were complete and in compliance with requirements. The module compares the contents of the files to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 14035986 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 4/28/2014

Project: Riverton **Analysis Type:** ☑ Metals ☐ General Chem ☑ Rad ☐ Organics

# of Samples: 18 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

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

Sample

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

Select Quality Parameters

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

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 14035986 **Lab Code:** PAR **Date Due:** 4/11/2014

Matrix: Water **Site Code:** RVT01 **Date Completed:** 4/2/2014

Analyte	Method Type	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	CCV	CCB								
Uranium	ICP/MS	03/26/2014	0.0000	1.0000	OK	OK	OK	115.0	114.0	117.0	2.0	105.0		100.0

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 14035986 **Lab Code:** PAR **Date Due:** 4/11/2014

Matrix: Water **Site Code:** RVT01 **Date Completed:** 4/2/2014

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
0813	Radium-226	03/30/2014			94.1			
0815	Radium-226	03/30/2014			95.1			
0818	Radium-226	03/30/2014			94.7			
0818	Radium-226	03/30/2014			94.2			
0819	Radium-226	03/30/2014			94.6			
0819	Radium-226	03/30/2014			90.0			
0820	Radium-226	03/30/2014			94.5			
0820	Radium-226	03/30/2014			89.6			
0821	Radium-226	03/30/2014			94.7			
0821	Radium-226	03/30/2014			96.4			
0829	Radium-226	03/30/2014			95.2			
0829	Radium-226	03/30/2014			96.0			
0830	Radium-226	03/30/2014			95.2			
0830	Radium-226	03/30/2014			92.3			
0834	Radium-226	03/30/2014			94.4			
0837	Radium-226	03/30/2014			98.8			
0843	Radium-226	03/30/2014			94.2			
2175	Radium-226	03/30/2014			95.8			
Blank_Spike	Radium-226	03/30/2014			93.5	98.90		
Blank_Spike_Du	Radium-226	03/30/2014			93.3	103.00		0.25
Blank	Radium-226	03/30/2014	0.0502	U	95.1			
0813	Radium-228	03/21/2014			98.1			
0815	Radium-228	03/21/2014			97.2			
0818	Radium-228	03/21/2014			96.6			
Blank_Spike	Radium-228	03/21/2014			97.8	124.00		
Blank_Spike_Du	Radium-228	03/21/2014			95.6	104.00		0.97
Blank	Radium-228	03/21/2014	0.4150	U	97.7			
0818	Radium-228	03/24/2014			97.9			
0819	Radium-228	03/24/2014			96.2			
0819	Radium-228	03/24/2014			94.6			
0820	Radium-228	03/24/2014			94.7			
0820	Radium-228	03/24/2014			95.0			

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 14035986 **Lab Code:** PAR **Date Due:** 4/11/2014

Matrix: Water **Site Code:** RVT01 **Date Completed:** 4/2/2014

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
0821	Radium-228	03/24/2014			96.1			
0829	Radium-228	03/24/2014			96.7			
0829	Radium-228	03/24/2014			92.5			
0830	Radium-228	03/24/2014			97.5			
0830	Radium-228	03/24/2014			96.3			
0834	Radium-228	03/24/2014			95.0			
0837	Radium-228	03/24/2014			97.0			
0843	Radium-228	03/24/2014			96.9			
2175	Radium-228	03/24/2014			98.3			
Blank_Spike	Radium-228	03/24/2014			91.9	116.00		
Blank_Spike_Du	Radium-228	03/24/2014			91.6	115.00		0.02
Blank	Radium-228	03/24/2014	0.4270	U	97.1			
0821	Radium-228	03/27/2014			92.6			
Blank_Spike	Radium-228	03/27/2014			91.9	79.70		
Blank_Spike_Du	Radium-228	03/27/2014			91.6	95.90		1.10
Blank	Radium-228	03/27/2014	0.3360		97.1			

Sampling Quality Control Assessment

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

Sampling Protocol

Samples were collected by filling bottles from a flowing domestic tap or hydrant.

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. Duplicate samples were collected from location 0818 (the end-of-flush sample, ticket number MET 424). For non-radiochemical measurements, the relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results less than 5 times the PQL, the range should be no greater than the PQL. For radiochemical measurements, the relative error ratio (the ratio of the absolute difference between the sample and duplicate results and the sum of the 1-sigma uncertainties) is used to evaluate duplicate results and should be less than 3. All duplicate results met these criteria, demonstrating acceptable precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 14035986 **Lab Code:** PAR **Project:** Riverton **Validation Date:** 4/28/2014

Duplicate: 2175 **Sample:** 0818

Analyte	Sample Result	Flag	Error	Dilution	Duplicate Result	Flag	Error	Dilution	RPD	RER	Units
Radium-226	0.65		0.287	1	0.573		0.265	1		0.4	pCi/L
Radium-228	0.378	U	0.358	1	0.718		0.397	1		1.2	pCi/L
Uranium	0.08	B		10	0.09	B		10			UG/L

Certification

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

Laboratory Coordinator: Stephen Donivan — Date: 5-20-2014

Data Validation Lead: Gretchen Baer — Date: 5/20/14

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the environmental database. The application compares the new data set (in standard environmental database units) with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition. The review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

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

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Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 1/1/2003

Laboratory: ALS Laboratory Group

RIN: 14035986

Report Date: 4/29/2014

					Current			**Historical Maximum**			**Historical Minimum**			**Number of Data Points**		**Statistical Outlier**
						Qualifiers			*Qualifiers*			*Qualifiers*				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
RVT01	0813	N001	03/11/2014	Radium-226	0.825			0.794	U		-0.117	U		8	5	No

STATISTICAL TESTS:
The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test.
Outliers are identified using Dixon's Test when there are 25 or fewer data points.
Outliers are identified using Rosner's Test when there are 26 or more data points.
See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, and February 2006.

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Attachment 2
Data Presentation

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Alternate Water Supply System
Water Quality Data

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General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0813 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.16			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	5.33			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	262			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.64			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.825			#	0.17	0.336
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.58	U		#	0.58	0.381
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	747			#		
Temperature	C	03/11/2014	N001	0	-	0	5.66			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	0.79			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.00011		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0815 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.05			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	4.34			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	290.7			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.71			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.531		J	#	0.18	0.256
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.639		J	#	0.57	0.396
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	664			#		
Temperature	C	03/11/2014	N001	0	-	0	5.96			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	1.69			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.0001		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0818 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.15			#		
Chlorine, Total Residual	mg/L	03/11/2014	N002	0	-	0	0.13			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	3.45			#		
Dissolved Oxygen	mg/L	03/11/2014	N002	0	-	0	5.1			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	459.4			#		
Oxidation Reduction Potential	mV	03/11/2014	N002	0	-	0	488.5			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.61			#		
pH	s.u.	03/11/2014	N002	0	-	0	8.67			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	1.05			#	0.19	0.399
Radium-226	pCi/L	03/11/2014	N002	0	-	0	0.65			#	0.17	0.287
Radium-226	pCi/L	03/11/2014	N003	0	-	0	0.573			#	0.18	0.265
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.968		J	#	0.64	0.48
Radium-228	pCi/L	03/11/2014	N002	0	-	0	0.56	U		#	0.56	0.358
Radium-228	pCi/L	03/11/2014	N003	0	-	0	0.718		J	#	0.55	0.397
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	659			#		
Specific Conductance	umhos /cm	03/11/2014	N002	0	-	0	657			#		
Temperature	C	03/11/2014	N001	0	-	0	4.93			#		
Temperature	C	03/11/2014	N002	0	-	0	7.72			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	2.03			#		
Turbidity	NTU	03/11/2014	N002	0	-	0	1.19			#		

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0818 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Uranium	mg/L	03/11/2014	N001	0	-	0	0.0001		J	#	0.000029	
Uranium	mg/L	03/11/2014	N002	0	-	0	0.00008	B	J	#	0.000029	
Uranium	mg/L	03/11/2014	N003	0	-	0	0.00009	B	J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0819 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.2			#		
Chlorine, Total Residual	mg/L	03/11/2014	N002	0	-	0	0.12			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	2.98			#		
Dissolved Oxygen	mg/L	03/11/2014	N002	0	-	0	3.83			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	520			#		
Oxidation Reduction Potential	mV	03/11/2014	N002	0	-	0	486.3			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.63			#		
pH	s.u.	03/11/2014	N002	0	-	0	8.67			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.7			#	0.19	0.306
Radium-226	pCi/L	03/11/2014	N002	0	-	0	0.587		J	#	0.2	0.281
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.682		J	#	0.51	0.371
Radium-228	pCi/L	03/11/2014	N002	0	-	0	0.663		J	#	0.52	0.376
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	658			#		
Specific Conductance	umhos /cm	03/11/2014	N002	0	-	0	650			#		
Temperature	C	03/11/2014	N001	0	-	0	4.67			#		
Temperature	C	03/11/2014	N002	0	-	0	7.41			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	2.76			#		
Turbidity	NTU	03/11/2014	N002	0	-	0	1.73			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.00011		J	#	0.000029	
Uranium	mg/L	03/11/2014	N002	0	-	0	0.00009	B	J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0820 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.13			#		
Chlorine, Total Residual	mg/L	03/11/2014	N002	0	-	0	0.15			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	4.15			#		
Dissolved Oxygen	mg/L	03/11/2014	N002	0	-	0	4.84			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	546.4			#		
Oxidation Reduction Potential	mV	03/11/2014	N002	0	-	0	550.6			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.69			#		
pH	s.u.	03/11/2014	N002	0	-	0	8.69			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.804			#	0.17	0.332
Radium-226	pCi/L	03/11/2014	N002	0	-	0	0.616			#	0.19	0.287
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.52	U		#	0.52	0.352
Radium-228	pCi/L	03/11/2014	N002	0	-	0	0.612		J	#	0.52	0.368
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	653			#		
Specific Conductance	umhos /cm	03/11/2014	N002	0	-	0	654			#		
Temperature	C	03/11/2014	N001	0	-	0	7.82			#		
Temperature	C	03/11/2014	N002	0	-	0	7.38			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	0.73			#		
Turbidity	NTU	03/11/2014	N002	0	-	0	0.79			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.00008	B	J	#	0.000029	
Uranium	mg/L	03/11/2014	N002	0	-	0	0.0001		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0821 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.18			#		
Chlorine, Total Residual	mg/L	03/11/2014	N002	0	-	0	0.11			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	4.04			#		
Dissolved Oxygen	mg/L	03/11/2014	N002	0	-	0	4.35			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	510.1			#		
Oxidation Reduction Potential	mV	03/11/2014	N002	0	-	0	531.4			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.7			#		
pH	s.u.	03/11/2014	N002	0	-	0	8.69			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.35		J	#	0.17	0.201
Radium-226	pCi/L	03/11/2014	N002	0	-	0	0.643			#	0.18	0.287
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.67		J	#	0.51	0.372
Radium-228	pCi/L	03/11/2014	N002	0	-	0	1		J	#	0.49	0.414
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	660			#		
Specific Conductance	umhos /cm	03/11/2014	N002	0	-	0	654			#		
Temperature	C	03/11/2014	N001	0	-	0	5.39			#		
Temperature	C	03/11/2014	N002	0	-	0	6.22			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	1.27			#		
Turbidity	NTU	03/11/2014	N002	0	-	0	0.75			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.00009	B	J	#	0.000029	
Uranium	mg/L	03/11/2014	N002	0	-	0	0.00009	B	J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0829 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.13			#		
Chlorine, Total Residual	mg/L	03/11/2014	N002	0	-	0	0.14			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	8.44			#		
Dissolved Oxygen	mg/L	03/11/2014	N002	0	-	0	4.85			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	289			#		
Oxidation Reduction Potential	mV	03/11/2014	N002	0	-	0	92.5			#		
pH	s.u.	03/11/2014	N001	0	-	0	7.51			#		
pH	s.u.	03/11/2014	N002	0	-	0	8.47			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.599			#	0.19	0.277
Radium-226	pCi/L	03/11/2014	N002	0	-	0	0.619			#	0.16	0.276
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.5	U		#	0.5	0.331
Radium-228	pCi/L	03/11/2014	N002	0	-	0	0.55	U		#	0.55	0.371
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	720			#		
Specific Conductance	umhos /cm	03/11/2014	N002	0	-	0	679			#		
Temperature	C	03/11/2014	N001	0	-	0	5.28			#		
Temperature	C	03/11/2014	N002	0	-	0	8.13			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	2.67			#		
Turbidity	NTU	03/11/2014	N002	0	-	0	1.69			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.00009	B	J	#	0.000029	
Uranium	mg/L	03/11/2014	N002	0	-	0	0.00009	B	J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0830 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.17			#		
Chlorine, Total Residual	mg/L	03/11/2014	N002	0	-	0	0.14			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	4.67			#		
Dissolved Oxygen	mg/L	03/11/2014	N002	0	-	0	3.73			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	327.6			#		
Oxidation Reduction Potential	mV	03/11/2014	N002	0	-	0	403.5			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.64			#		
pH	s.u.	03/11/2014	N002	0	-	0	8.67			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.635			#	0.19	0.287
Radium-226	pCi/L	03/11/2014	N002	0	-	0	0.45		J	#	0.19	0.238
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.575		J	#	0.49	0.347
Radium-228	pCi/L	03/11/2014	N002	0	-	0	0.649		J	#	0.53	0.376
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	661			#		
Specific Conductance	umhos /cm	03/11/2014	N002	0	-	0	655			#		
Temperature	C	03/11/2014	N001	0	-	0	6.61			#		
Temperature	C	03/11/2014	N002	0	-	0	8.88			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	2.19			#		
Turbidity	NTU	03/11/2014	N002	0	-	0	1.32			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.0001		J	#	0.000029	
Uranium	mg/L	03/11/2014	N002	0	-	0	0.00009	B	J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0834 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.11			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	3.75			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	565.2			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.67			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.424		J	#	0.17	0.225
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.65	U		#	0.65	0.411
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	655			#		
Temperature	C	03/11/2014	N001	0	-	0	6.55			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	0.76			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.00009	B	J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0837 DOMESTIC SUPPLY Domestic System, Tap Location

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.11			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	4.32			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	556.7			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.7			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.678			#	0.18	0.294
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.581		U	#	0.57	0.39
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	661			#		
Temperature	C	03/11/2014	N001	0	-	0	6.57			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	1.53			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.00009	B	J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 4/29/2014
Location: 0843 DOMESTIC SUPPLY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chlorine, Total Residual	mg/L	03/11/2014	N001	0	-	0	0.17			#		
Dissolved Oxygen	mg/L	03/11/2014	N001	0	-	0	6.34			#		
Oxidation Reduction Potential	mV	03/11/2014	N001	0	-	0	479.9			#		
pH	s.u.	03/11/2014	N001	0	-	0	8.7			#		
Radium-226	pCi/L	03/11/2014	N001	0	-	0	0.786			#	0.17	0.326
Radium-228	pCi/L	03/11/2014	N001	0	-	0	0.85		J	#	0.68	0.484
Specific Conductance	umhos /cm	03/11/2014	N001	0	-	0	654			#		
Temperature	C	03/11/2014	N001	0	-	0	4.84			#		
Turbidity	NTU	03/11/2014	N001	0	-	0	1.86			#		
Uranium	mg/L	03/11/2014	N001	0	-	0	0.0001		J	#	0.000029	

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:
#Validated according to quality assurance guidelines.

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Attachment 3
Sampling and Analysis Work Order

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Stoller

established 1959

Task Order LM-501
Control Number 14-0353

February 10, 2014

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

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
March 2014 Water Flushing Sampling at the Riverton, Wyoming, Processing Site

Reference: Task Order LM-501-02-117-402, Riverton, Wyoming, Processing Site

Dear Mr. Dam:

The purpose of this letter is to inform you of the upcoming sampling event at Riverton, Wyoming. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Riverton Processing Site. Water quality data will be collected from the following locations during flushing of the Alternate Water Supply System, scheduled to begin the week of March 10, 2014.

The following list shows the water supply system locations scheduled to be sampled during this event.

Alternate Water Supply System

813	815	818	820	829	834	843
814	816	819	821	830	837	

Alternate Water Supply System samples will be collected as directed in the *Alternate Water Supply System Flushing Plan Riverton, Wyoming.*

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

Sincerely,

Sam Campbell

Sam Campbell
Site Lead

SC/lcg/lb

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

SC/lcg/lb

Enclosures (3)

cc: (electronic)
Christina Pennal, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction
File: RVT410.02 (A)

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

Constituent Sampling Breakdown

Site	Riverton					
Analyte	Groundwater	Surface Water	AWSS	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	138	36	38			
Field Measurements						
Alkalinity	X	X				
Dissolved Oxygen	X	X	X			
Redox Potential	X	X	X			
Residual Chlorine			X			
pH	X	X	X			
Specific Conductance	X	X	X			
Turbidity	X	X	X			
Temperature	X	X	X			
Laboratory Measurements						
Aluminum						
Ammonia as N (NH3-N)						
Calcium	X	X		5	SW-846 6010	LMM-01
Chloride	X	X		0.5	SW-846 9056	MIS-A-039
Chromium						
Iron						
Lead						
Magnesium	X	X		5	SW-846 6010	LMM-01
Manganese	X	X		0.005	SW-846 6010	LMM-01
Molybdenum	X	X		0.003	SW-846 6020	LMM-02
Nickel						
Nitrate + Nitrite as N (NO3+NO2)-N						
Potassium	X	X		1	SW-846 6010	LMM-01
Radium-226		0822 only	X	1 pCi/L	Gas Proportional Counter	GPC-A-018
Radium-228		0822 only	X	1 pCi/L	Gas Proportional Counter	GPC-A-020
Selenium						
Silica						
Sodium	X	X		1	SW-846 6010	LMM-01
Strontium						
Sulfate	X	X		0.5	SW-846 9056	MIS-A-044
Total Dissolved Solids						
Total Organic Carbon						
Uranium	X	X	X	0.0001	SW-846 6020	LMM-02
Vanadium						
Zinc						
Total No. of Analytes	9	11	3			

Note: All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

Sampling Frequencies for Locations at Riverton, Wyoming

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Alternate Water Supply System						
813		X				
814		X				
815		X				
816		X				
818		X				
819		X				
820		X				
821		X				
829		X				
830		X				
834		X				
837		X				
843		X				

Semiannual hydrant flushing and sampling conducted in October and March

Attachment 4
Trip Report

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Stoller

Memorandum

DATE: March 21, 2014

TO: Distribution

FROM: Sam Campbell

SUBJECT: Trip Report

Site: Riverton, Wyoming, Processing Site.

Dates of Sampling Event: March 11, 2014

Team Members: Dan Sellers and Sam Campbell

Number of Locations Sampled: 8 alternate water supply system (AWSS) hydrants, and 4 AWSS taps.

Locations Not Sampled/Reason: AWSS tap location 0814 was not sampled because the house was vacant. AWSS tap location 0816 was not sampled because a family gathering was occurring the afternoon of the flushing event, and the samplers were requested to come back the next morning. Upon return the next morning, no one was home to provide access to the tap, which is located inside the house.

Location Specific Information: Separate water sampling field data sheets were created for the 5-minute flush sample and the end-of-flush sample.

The dissolved oxygen measurement for the 5-minute flush sample at location 0829 was erroneous and was removed from the field data sheet because it was discovered that the membrane had come off the dissolved oxygen probe during the measurement. The membrane was reinstalled, and the probe was recalibrated prior to the end-of-flush sample.

Hydrant Flushing: Following is a summary of the hydrant flushing volumes.

Hydrant Location	Work Plan Flush Volume (gal)	Total Volume Flushed (gal)
0818	20,259	23,330
0819	42,703	50,110
0820	4,803	5,040
0821	16,854	14,230
0829	20,477	22,180
0830	33,728	36,050
0834	969	1,030
0843	2,644	2,820

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Field Variance: The total volume flushed at location 0821 (14,230 gallons) did not exceed the flush volume specified in the work plan (16,854 gallons); however, the flush volume specified in the work plan included some buffer, and the flush volume was greater than pipe volume (13,488 gallons).

Quality Control Sample Cross Reference: One field-duplicate sample was collected at location 0818; the duplicate was given a false identification number of 2175 and ticket number MET-451. No portable sampling equipment was used during this event, so an equipment blank was not required.

Requisition Numbers Assigned: All samples were assigned to requisition index number (RIN) 14035986 and were shipped to the ALS Laboratory Group on March 13, 2014.

Water Level Measurements: No water levels were measured during this event.

Well Inspection Summary: No well inspections were conducted during this event.

Equipment: All equipment functioned properly.

Stakeholder/Regulatory: Northern Arapaho Water and Sewer personnel (Mike Quiver and Darrel Hutchinson) conducted the hydrant flushing. The new director of the Northern Arapaho Water and Sewer, Jeremiah Farrell, provided oversight of the flushing activities. Ricki Trosper of the Wind River Environmental Quality Commission (WREQC) provided oversight and collected co-samples at five locations.

Access Issues: Northern Arapaho Water and Sewer personnel provided access to all hydrant locations.

Corrective Action Required/Taken: DOE contacted WREQC personnel to obtain a sample from tap location 0816.

(SEC/lcg)

cc: (electronic)
Bill Dam, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Judy Miller, Stoller
EDD Delivery