

DOE Oversight Bureau, New Mexico Environment Department

**Groundwater Monitoring at
Sandia National Laboratories/New Mexico
Long-Term Stewardship Consolidated Groundwater Monitoring Program**

**Conducted by the
New Mexico Environment Department DOE Oversight Bureau
for FFY 2017**

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Final Report

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The purpose of this communication is to transmit groundwater data collected by the New Mexico Environment Department DOE Oversight Bureau from Long-Term Stewardship Consolidated Groundwater Monitoring Program during FFY 2017.

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Introduction

The New Mexico Environment Department (NMED) DOE Oversight Bureau (DOE-OB or Bureau) has compiled and assessed groundwater data collected during January-May 2017. The Bureau collected groundwater samples from Long-Term Stewardship (LTS) Consolidated Groundwater Monitoring Program (GMP) monitoring wells MRN-3D, NWT3-MW3D, PL-2, PL-4, SFR-2S (plus duplicate), SFR-4T, SWTA3-MW2, SWTA3-MW3 and TRE-1. Samples were also collected from Coyote Spring located in Arroyo del Coyote. Split samples were collected using standard Sandia National Laboratories/New Mexico (SNL/NM) sampling procedures and equipment. The samples were submitted for analysis to an independent analytical laboratory for target analyte list (TAL) metals plus uranium, total mercury, anions, nitrate-nitrite as nitrogen, cyanide, volatile organic compounds (VOCs), high explosives (HE), gamma emitting isotopes, gross alpha and beta, radium, and isotopic uranium. All samples were filtered in the field using in-line filters of 0.45-micron pore size, except those for VOCs, HE, and mercury fractions. An elevated concentration of beryllium, exceeding the U.S. Environmental Protection Agency (EPA) drinking water standard was observed in the sample collected from Coyote Springs. All other sample results were detected below EPA standards.

Data Assessment

All groundwater samples were collected and analyzed in accordance with U.S EPA-specified protocols. Data results are compared to applicable Maximum Contaminant Levels (MCLs) established by the U.S. EPA National Primary Drinking Water Regulations (40 CFR 141), National Primary Drinking Water Standards, EPA, July 2002.

Results

Analytical results for TAL metals are presented in Table-1. Samples were analyzed for dissolved (filtered) metals plus uranium. No metal parameters were detected above established regulatory standards, except for beryllium. Beryllium was detected above the EPA MCL of 0.004 milligrams per liter (mg/L) from the sample collected at Coyote Springs at a concentration of 0.0071 mg/L.

Mercury results are summarized in Table-2. Mercury was analyzed using unfiltered samples and is reported as total mercury. Mercury was not detected above associated laboratory method detection limits (MDLs).

Analytical results for anions (bromide, chloride, fluoride and sulfate), nitrate-nitrite as nitrogen and total cyanide are presented in Table-3. No analytes were detected above established MCLs. Nitrate was detected in water samples above associated MDLs and ranged from 0.21 mg/L at SFR-4T to 5.1 mg/L at PL-4.

Total cyanide was not detected in all but one sample, SWTA3-MW3, at a concentration of 0.016 mg/L, and below the EPA MCL of 200 mg/L.

Volatile organic compounds detected above the laboratory MDLs are listed in Table-4. Chloroform and toluene were the only compound detected above the laboratory MDLs. Chloroform was detected at TRE-1 at a concentration of 0.55 microgram per liter ($\mu\text{g/L}$) and toluene was detected in the sample collected from SWTA3-MW3 at a concentration of 0.34 $\mu\text{g/L}$. Both results were below the laboratory detection limit and established EPA drinking water standards. Table-5 lists the laboratory MDLs for the remaining VOC compounds.

No HE compounds were detected above laboratory MDLs. The laboratory MDLs for HE compounds are listed in Table-6. Analysis for HE compounds was only conducted on groundwater samples collected from monitoring wells SFR-2S, SFR-4T, SWTA3-MW2, SWTA3-MW3 and TRE-1.

Analytical results for radiological analyses are summarized in Table-7. Samples were analyzed for gross alpha and beta, gamma emitting isotopes, radium-226, radium-228, and isotopic uranium. Unadjusted gross alpha activity ranged from 2 picocuries per liter (pCi/L) at SWTA3-MW3 to 22 pCi/L at TRE-1. The EPA MCL for gross alpha activity of 15 pCi/L is based on a corrected gross alpha value, which excludes both total uranium and radon from initial gross alpha count. Subsequently, when the total uranium activity is subtracted from the gross alpha value, the gross activity results from all samples are below the MCL. Gross alpha results in Table-7 are reported as uncorrected results. All other gamma emitters and radium isotopes were below established MCLs.

Conclusion

During this annual sampling event for LTS-GMP, environmental samples were collected from nine (9) groundwater monitoring wells MRN-3D, NWT3-MW3D, PL-2, PL-4, SFR-2S, SFR-4T, SWTA3-MW2, SWTA3-MW3 and TRE-1. One (1) surface water sample was also collected from Coyote Spring. Beryllium was detected above the MCL of 0.004 mg/L in the sample collected from Coyote Spring at a concentration of 0.0071 mg/L. Beryllium concentrations observed during this event compare well to past data. Historically, beryllium concentrations at Coyote Spring have exceeded the EPA drinking water standard. All other sample results were detected below associated MCLs.

The DOE-OB will continue to collect and monitor groundwater quality at these LTS GMP monitoring wells, including Coyote Spring, and provide data results to DOE.

Table-1

Groundwater Quality Results: Dissolved Target Analyte List Metals plus Uranium
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
COYOTE SPRING 2-Feb-17	Aluminum	0.22	NE	0.1	0.014		SW-846:6020
	Antimony	0.000084	0.006	0.001	0.000084	U	SW-846:6020
	Arsenic	0.0066	0.01	0.002	0.00018		SW-846:6020
	Barium	0.041	2	0.005	0.00023		SW-846:6020
	Beryllium	0.0071	0.004	0.0005	0.00027		SW-846:6020
	Cadmium	0.0001	0.005	0.002	0.000099	J	SW-846:6020
	Calcium	300	NE	1	0.061		SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.01	NE	0.005	0.00007		SW-846:6020
	Copper	0.0011	NE	0.02	0.0011	U	SW-846:6020
	Iron	0.082	NE	0.1	0.0053	J	SW-846:6020
	Lead	0.00016	NE	0.002	0.00016	U	SW-846:6020
	Magnesium	63	NE	0.1	0.02		SW-846:6020
	Manganese	1.5	NE	0.005	0.0003	B	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.027	NE	0.02	0.0042	B	SW-846:6020
	Potassium	31	NE	1	0.32		SW-846:6020
	Selenium	0.00066	0.05	0.01	0.00066	U	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	420	NE	1	0.19		SW-846:6020
Thallium	0.0014	0.002	0.0001	0.000014		SW-846:6020	
Uranium	0.0068	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.00058	NE	0.005	0.00058	U	SW-846:6020	
Zinc	0.052	NE	0.1	0.0091	J	SW-846:6020	

B = Compound was found in the blank and sample.

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Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
MRN-3D 10-Feb-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.000084	0.006	0.001	0.000084	U	SW-846:6020
	Arsenic	0.001	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.13	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00028	0.004	0.0005	0.00027	J	SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	61	NE	1	0.061	B	SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.00009	NE	0.005	0.00007	J	SW-846:6020
	Copper	0.0011	NE	0.02	0.0011	U	SW-846:6020
	Iron	0.024	NE	0.1	0.0053	J	SW-846:6020
	Lead	0.00016	NE	0.002	0.00016	U	SW-846:6020
	Magnesium	14	NE	0.1	0.02		SW-846:6020
	Manganese	0.00041	NE	0.005	0.0003	J	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0042	NE	0.02	0.0042	U	SW-846:6020
	Potassium	4.4	NE	1	0.32		SW-846:6020
	Selenium	0.0014	0.05	0.01	0.00066	J	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	28	NE	1	0.19		SW-846:6020
	Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020
Uranium	0.0039	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.0056	NE	0.005	0.00058		SW-846:6020	
Zinc	0.043	NE	0.1	0.0091	J	SW-846:6020	

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Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
NWTA3-MW3D 5-May-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.0003	0.006	0.001	0.0003	U	SW-846:6020
	Arsenic	0.00088	0.01	0.002	0.0006	J	SW-846:6020
	Barium	0.087	2	0.005	0.0018		SW-846:6020
	Beryllium	0.00015	0.004	0.0005	0.00015	U	SW-846:6020
	Cadmium	0.0006	0.005	0.002	0.0006	U	SW-846:6020
	Calcium	37	NE	1	0.3		SW-846:6020
	Chromium	0.003	0.1	0.01	0.003	U	SW-846:6020
	Cobalt	0.0015	NE	0.005	0.0015	U	SW-846:6020
	Copper	0.006	NE	0.02	0.006	U	SW-846:6020
	Iron	0.03	NE	0.1	0.03	U	SW-846:6020
	Lead	0.00085	NE	0.002	0.00085	U	SW-846:6020
	Magnesium	7.5	NE	0.1	0.03		SW-846:6020
	Manganese	0.0015	NE	0.005	0.0015	U	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.011	NE	0.02	0.011	U	SW-846:6020
	Potassium	3.5	NE	1	0.3		SW-846:6020
	Selenium	0.0035	0.05	0.01	0.0035	U	SW-846:6020
	Silver	0.00015	NE	0.0005	0.00015	U	SW-846:6020
	Sodium	36	NE	1	0.3		SW-846:6020
Thallium	0.000084	0.002	0.0001	0.000084	U	SW-846:6020	
Uranium	0.0031	0.03	0.0001	0.00003		SW-846:6020	
Vanadium	0.0071	NE	0.005	0.0015		SW-846:6020	
Zinc	0.048	NE	0.1	0.048	U	SW-846:6020	

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PL-2 26-Jan-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.000084	0.006	0.001	0.000084	U	SW-846:6020
	Arsenic	0.00075	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.071	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00027	0.004	0.0005	0.00027	U	SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	57	NE	1	0.061		SW-846:6020
	Chromium	0.002	0.1	0.01	0.0011	J	SW-846:6020
	Cobalt	0.00007	NE	0.005	0.00007	U	SW-846:6020
	Copper	0.0026	NE	0.02	0.0011	J	SW-846:6020
	Iron	0.009	NE	0.1	0.0053	JB	SW-846:6020
	Lead	0.00016	NE	0.002	0.00016	U	SW-846:6020
	Magnesium	8.8	NE	0.1	0.02		SW-846:6020
	Manganese	0.0003	NE	0.005	0.0003	U	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0079	NE	0.02	0.0042	JB	SW-846:6020
	Potassium	3.5	NE	1	0.32		SW-846:6020
	Selenium	0.0012	0.05	0.01	0.00066	J	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	27	NE	1	0.19		SW-846:6020
Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020	
Uranium	0.0028	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.0053	NE	0.005	0.00058		SW-846:6020	
Zinc	0.0097	NE	0.1	0.0091	JB	SW-846:6020	

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PL-4 27-Jan-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.000084	0.006	0.001	0.000084	U	SW-846:6020
	Arsenic	0.00056	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.07	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00027	0.004	0.0005	0.00027	U	SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	65	NE	1	0.061		SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.00007	NE	0.005	0.00007	U	SW-846:6020
	Copper	0.0011	NE	0.02	0.0011	U	SW-846:6020
	Iron	0.0053	NE	0.1	0.0053	U	SW-846:6020
	Lead	0.00016	NE	0.002	0.00016	U	SW-846:6020
	Magnesium	12	NE	0.1	0.02		SW-846:6020
	Manganese	0.0003	NE	0.005	0.0003	U	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0058	NE	0.02	0.0042	JB	SW-846:6020
	Potassium	4.9	NE	1	0.32		SW-846:6020
	Selenium	0.0015	0.05	0.01	0.00066	J	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	24	NE	1	0.19		SW-846:6020
	Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020
Uranium	0.0031	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.0037	NE	0.005	0.00058	J	SW-846:6020	
Zinc	0.0091	NE	0.1	0.0091	U	SW-846:6020	

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SFR-2S 24-Jan-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.000084	0.006	0.001	0.000084	U	SW-846:6020
	Arsenic	0.00079	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.055	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00052	0.004	0.0005	0.00027		SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	120	NE	1	0.061		SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.00008	NE	0.005	0.00007	J	SW-846:6020
	Copper	0.002	NE	0.02	0.0011	J	SW-846:6020
	Iron	0.014	NE	0.1	0.0053	JB	SW-846:6020
	Lead	0.00025	NE	0.002	0.00016	J	SW-846:6020
	Magnesium	33	NE	0.1	0.02		SW-846:6020
	Manganese	0.00067	NE	0.005	0.0003	J	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0053	NE	0.02	0.0042	JB	SW-846:6020
	Potassium	7.1	NE	1	0.32		SW-846:6020
	Selenium	0.0017	0.05	0.01	0.00066	J	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	80	NE	1	0.19		SW-846:6020
	Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020
Uranium	0.013	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.0033	NE	0.005	0.00058	J	SW-846:6020	
Zinc	0.0091	NE	0.1	0.0091	U	SW-846:6020	

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SFR-2S 24-Jan-17 (Duplicate)	Aluminum	0.019	NE	0.1	0.014	JB	SW-846:6020
	Antimony	0.00017	0.006	0.001	0.000084	JB	SW-846:6020
	Arsenic	0.00093	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.067	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00051	0.004	0.0005	0.00027		SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	120	NE	1	0.061		SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.00009	NE	0.005	0.00007	J	SW-846:6020
	Copper	0.0027	NE	0.02	0.0011	J	SW-846:6020
	Iron	0.039	NE	0.1	0.0053	JB	SW-846:6020
	Lead	0.00032	NE	0.002	0.00016	J	SW-846:6020
	Magnesium	34	NE	0.1	0.02		SW-846:6020
	Manganese	0.00059	NE	0.005	0.0003	J	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0092	NE	0.02	0.0042	JB	SW-846:6020
	Potassium	7.4	NE	1	0.32		SW-846:6020
	Selenium	0.0018	0.05	0.01	0.00066	J	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	82	NE	1	0.19		SW-846:6020
	Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020
Uranium	0.014	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.0033	NE	0.005	0.00058	J	SW-846:6020	
Zinc	0.013	NE	0.1	0.0091	JB	SW-846:6020	

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SFR-4T 25-Jan-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.0001	0.006	0.001	0.000084	JB	SW-846:6020
	Arsenic	0.0018	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.009	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00027	0.004	0.0005	0.00027	U	SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	61	NE	1	0.061		SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.00007	NE	0.005	0.00007	U	SW-846:6020
	Copper	0.0011	NE	0.02	0.0011	U	SW-846:6020
	Iron	0.032	NE	0.1	0.0053	JB	SW-846:6020
	Lead	0.00016	NE	0.002	0.00016	U	SW-846:6020
	Magnesium	3.3	NE	0.1	0.02		SW-846:6020
	Manganese	0.0042	NE	0.005	0.0003	J	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0042	NE	0.02	0.0042	U	SW-846:6020
	Potassium	2.5	NE	1	0.32		SW-846:6020
	Selenium	0.00066	0.05	0.01	0.00066	U	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	1000	NE	1	0.19		SW-846:6020
	Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020
Uranium	0.00022	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.00062	NE	0.005	0.00058	J	SW-846:6020	
Zinc	0.015	NE	0.1	0.0091	JB	SW-846:6020	

B = Compound was found in the blank and sample.

J = the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to the Method Detection Limit (MDL).

NE = Not Established

U = the analyte was analyzed for but not detected

Table-1

Groundwater Quality Results: Dissolved Target Analyte List Metals plus Uranium
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
SWTA3-MW2 21-Apr-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.0003	0.006	0.001	0.0003	U	SW-846:6020
	Arsenic	0.00075	0.01	0.002	0.0006	J	SW-846:6020
	Barium	0.071	2	0.005	0.0018		SW-846:6020
	Beryllium	0.00015	0.004	0.0005	0.00015	U	SW-846:6020
	Cadmium	0.0006	0.005	0.002	0.0006	U	SW-846:6020
	Calcium	44	NE	1	0.3		SW-846:6020
	Chromium	0.003	0.1	0.01	0.003	U	SW-846:6020
	Cobalt	0.0015	NE	0.005	0.0015	U	SW-846:6020
	Copper	0.006	NE	0.02	0.006	U	SW-846:6020
	Iron	0.043	NE	0.1	0.03	J	SW-846:6020
	Lead	0.00085	NE	0.002	0.00085	U	SW-846:6020
	Magnesium	13	NE	0.1	0.03		SW-846:6020
	Manganese	0.0015	NE	0.005	0.0015	U	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.011	NE	0.02	0.011	U	SW-846:6020
	Potassium	4.3	NE	1	0.3		SW-846:6020
	Selenium	0.0035	0.05	0.01	0.0035	U	SW-846:6020
	Silver	0.00015	NE	0.0005	0.00015	U	SW-846:6020
	Sodium	36	NE	1	0.3		SW-846:6020
	Thallium	0.000084	0.002	0.0001	0.000084	U	SW-846:6020
Uranium	0.003	0.03	0.0001	0.00003		SW-846:6020	
Vanadium	0.006	NE	0.005	0.0015		SW-846:6020	
Zinc	0.048	NE	0.1	0.048	U	SW-846:6020	

B = Compound was found in the blank and sample.

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NE = Not Established

U = the analyte was analyzed for but not detected

Table-1

Groundwater Quality Results: Dissolved Target Analyte List Metals plus Uranium
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
SWTA3-MW3 24-Feb-17	Aluminum	0.014	NE	0.1	0.014	J	SW-846:6020
	Antimony	0.000084	0.006	0.001	0.000084	U	SW-846:6020
	Arsenic	0.00098	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.058	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00052	0.004	0.0005	0.00027		SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	38	NE	1	0.061		SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.00009	NE	0.005	0.00007	J	SW-846:6020
	Copper	0.016	NE	0.02	0.0011	J	SW-846:6020
	Iron	0.0053	NE	0.1	0.0053	U	SW-846:6020
	Lead	0.0012	NE	0.002	0.00016	J	SW-846:6020
	Magnesium	9.7	NE	0.1	0.02		SW-846:6020
	Manganese	0.0003	NE	0.005	0.0003	U	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0042	NE	0.02	0.0042	U	SW-846:6020
	Potassium	4.4	NE	1	0.32		SW-846:6020
	Selenium	0.001	0.05	0.01	0.00066	J	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	47	NE	1	0.19		SW-846:6020
Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020	
Uranium	0.0022	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.0075	NE	0.005	0.00058		SW-846:6020	
Zinc	0.0091	NE	0.1	0.0091	U	SW-846:6020	

B = Compound was found in the blank and sample.

J = the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to the Method Detection Limit (MDL).

NE = Not Established

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Table-1

Groundwater Quality Results: Dissolved Target Analyte List Metals plus Uranium
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TRE-1 8-Feb-17	Aluminum	0.014	NE	0.1	0.014	U	SW-846:6020
	Antimony	0.000084	0.006	0.001	0.000084	U	SW-846:6020
	Arsenic	0.001	0.01	0.002	0.00018	J	SW-846:6020
	Barium	0.047	2	0.005	0.00023		SW-846:6020
	Beryllium	0.00027	0.004	0.0005	0.00027	U	SW-846:6020
	Cadmium	0.000099	0.005	0.002	0.000099	U	SW-846:6020
	Calcium	170	NE	1	0.061		SW-846:6020
	Chromium	0.0011	0.1	0.01	0.0011	U	SW-846:6020
	Cobalt	0.00007	NE	0.005	0.00007	U	SW-846:6020
	Copper	0.0011	NE	0.02	0.0011	U	SW-846:6020
	Iron	0.0075	NE	0.1	0.0053	J	SW-846:6020
	Lead	0.00016	NE	0.002	0.00016	U	SW-846:6020
	Magnesium	37	NE	0.1	0.02		SW-846:6020
	Manganese	0.0003	NE	0.005	0.0003	U	SW-846:6020
	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
	Nickel	0.0068	NE	0.02	0.0042	JB	SW-846:6020
	Potassium	7.3	NE	1	0.32		SW-846:6020
	Selenium	0.0024	0.05	0.01	0.00066	J	SW-846:6020
	Silver	0.000039	NE	0.0005	0.000039	U	SW-846:6020
	Sodium	110	NE	1	0.19		SW-846:6020
	Thallium	0.000014	0.002	0.0001	0.000014	U	SW-846:6020
Uranium	0.017	0.03	0.0001	0.000027		SW-846:6020	
Vanadium	0.0027	NE	0.005	0.00058	J	SW-846:6020	
Zinc	0.0091	NE	0.1	0.0091	U	SW-846:6020	

B = Compound was found in the blank and sample.

J = the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to the Method Detection Limit (MDL).

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U = the analyte was analyzed for but not detected

Table-2

Groundwater Quality Results: Total Mercury

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

New Mexico Environment Department DOE Oversight Bureau

January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
COYOTE SPRING 2-Feb-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
MRN-3D 10-Feb-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
NWTA3-MW3D 5-May-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
PL-2 26-Jan-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
PL-4 27-Jan-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
SFR-2S 24-Jan-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
SFR-2S 24-Jan-17 (Duplicate)	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
SFR-4T 25-Jan-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
SWTA3-MW2 21-Apr-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
SWTA3-MW3 24-Feb-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A
TRE-1 8-Feb-17	Mercury	0.00006	0.002	0.0001	0.00006	U	SW-846:7470A

U = the analyte was analyzed for but not detected

Table-3

Groundwater Quality Results: Anions, Nitrate-Nitrite as Nitrogen and Total Cyanide
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
COYOTE SPRING 2-Feb-17	Bromide	1.9	NE	0.4	0.12		EPA:300.0
	Chloride	550	NE	10	3		EPA:300.0
	Cyanide (Total)	0.0036	200	0.01	0.0036	U	SW-846:9014
	Fluoride	1.7	4	0.2	0.06		EPA:300.0
	Nitrate-Nitrite as Nitrogen	0.64	10	0.1	0.03		EPA:353.2
	Sulfate	130	NE	20	6		EPA:300.0
MRN-3D 10-Feb-17	Bromide	0.06	NE	0.2	0.06	U	EPA:300.0
	Chloride	16	NE	0.2	0.06		EPA:300.0
	Cyanide (Total)	0.0036	200	0.01	0.0036	U	SW-846:9014
	Fluoride	0.4	4	0.1	0.03		EPA:300.0
	Nitrate-Nitrite as Nitrogen	2.7	10	0.1	0.03		EPA:353.2
	Sulfate	70	NE	1	0.3		EPA:300.0
NWTA3-MW3D 5-May-17	Bromide	0.2	NE	0.2	0.2	U	EPA:300.0
	Chloride	14	NE	0.2	0.2		EPA:300.0
	Cyanide (Total)	0.003	200	0.01	0.003	U	SW-846:9014
	Fluoride	0.89	4	0.1	0.1		EPA:300.0
	Nitrate-Nitrite as Nitrogen	1.1	10	0.01	0.003		EPA:353.2
	Sulfate	60	NE	1	1		EPA:300.0
PL-2 26-Jan-17	Bromide	0.06	NE	0.2	0.06	U	EPA:300.0
	Chloride	17	NE	0.2	0.06		EPA:300.0
	Cyanide (Total)	0.01	200	0.01	0.01	U	SW-846:9014
	Fluoride	0.49	4	0.1	0.03		EPA:300.0
	Nitrate-Nitrite as Nitrogen	2.7	10	0.1	0.03		EPA:353.2
	Sulfate	78	NE	1	0.3		EPA:300.0
PL-4 27-Jan-17	Bromide	0.06	NE	0.2	0.06	U	EPA:300.0
	Chloride	18	NE	0.2	0.06		EPA:300.0
	Cyanide (Total)	0.01	200	0.01	0.01	U	SW-846:9014
	Fluoride	0.33	4	0.1	0.03		EPA:300.0
	Nitrate-Nitrite as Nitrogen	5.1	10	0.1	0.03		EPA:353.2
	Sulfate	77	NE	1	0.3		EPA:300.0

NE = Not Established

U = the analyte was analyzed for but not detected

Table-3

Groundwater Quality Results: Anions, Nitrate-Nitrite as Nitrogen and Total Cyanide
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
SFR-2S 24-Jan-17	Bromide	0.59	NE	0.2	0.06		EPA:300.0
	Chloride	140	NE	10	3		EPA:300.0
	Cyanide (Total)	0.01	200	0.01	0.01	U	SW-846:9014
	Fluoride	1.8	4	0.1	0.03		EPA:300.0
	Nitrate-Nitrite as Nitrogen	0.98	10	0.01	0.003		EPA:353.2
	Sulfate	79	NE	1	0.3		EPA:300.0
SFR-2S 24-Jan-17 (Duplicate)	Bromide	0.61	NE	0.2	0.06		EPA:300.0
	Chloride	140	NE	10	3		EPA:300.0
	Cyanide (Total)	0.01	200	0.01	0.01	U	SW-846:9014
	Fluoride	1.8	4	0.1	0.03		EPA:300.0
	Nitrate-Nitrite as Nitrogen	0.97	10	0.01	0.003		EPA:353.2
	Sulfate	80	NE	1	0.3		EPA:300.0
SFR-4T 25-Jan-17	Bromide	1.4	NE	1	0.3		EPA:300.0
	Chloride	220	NE	5	1.5		EPA:300.0
	Cyanide (Total)	0.01	200	0.01	0.01	U	SW-846:9014
	Fluoride	2.8	4	0.5	0.15		EPA:300.0
	Nitrate-Nitrite as Nitrogen	0.21	10	0.01	0.003		EPA:353.2
	Sulfate	490	NE	5	1.5		EPA:300.0
SWTA3-MW2 21-Apr-17	Bromide	0.06	NE	0.2	0.06	U	EPA:300.0
	Chloride	17	NE	0.2	0.06		EPA:300.0
	Cyanide (Total)	0.003	200	0.01	0.003	U	SW-846:9014
	Fluoride	1	4	0.1	0.03		EPA:300.0
	Nitrate-Nitrite as Nitrogen	0.92	10	0.01	0.003		EPA:353.2
	Sulfate	57	NE	1	0.15		EPA:300.0
SWTA3-MW3 24-Feb-17	Bromide	0.06	NE	0.2	0.06	U	EPA:300.0
	Chloride	16	NE	0.2	0.06		EPA:300.0
	Cyanide (Total)	0.016	200	0.01	0.0036		SW-846:9014
	Fluoride	1.4	4	0.1	0.03		EPA:300.0
	Nitrate-Nitrite as Nitrogen	0.617	10	0.05	0.02		EPA:353.2
	Sulfate	70	NE	1	0.3		EPA:300.0

NE = Not Established

U = the analyte was analyzed for but not detected

Table-3

Groundwater Quality Results: Anions, Nitrate-Nitrite as Nitrogen and Total Cyanide
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TRE-1 8-Feb-17	Bromide	0.73	NE	0.4	0.12		EPA:300.0
	Chloride	150	NE	2	0.6		EPA:300.0
	Cyanide (Total)	0.0036	200	0.01	0.0036	U	SW-846:9014
	Fluoride	1.7	4	0.2	0.06		EPA:300.0
	Nitrate-Nitrite as Nitrogen	2.2	10	0.1	0.03		EPA:353.2
	Sulfate	110	NE	2	0.6		EPA:300.0

NE = Not Established

U = the analyte was analyzed for but not detected

Table-4

Groundwater Quality Results: Detected Volatile Organic Compounds
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	EPA MCL (µg/L)	Laboratory Detection Limit (µg/L)	MDL (µg/L)	Laboratory Qualifier	Analytical Method
SWTA3-MW3 24-Feb-17	Toluene	0.34	1000	1	0.3	J	SW-846:8260B_25
TRE-1 8-Feb-17	Chloroform	0.55	NE	1	0.3	J	SW-846:8260B_25

J = the reported value was obtained from a reading that was less than the Reporting Limit but greater than or equal to the Method Detection Limit (MDL).

NE = Not Established

Table-5

Groundwater Quality Results: Method Detection Limits for Volatile Organic Compounds (SW-846:8260B)
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Analyte	MDL (µg/L)
Acetone	3
Benzene	0.30 - 0.32
Bromobenzene	0.3
Bromochloromethane	0.30 - 0.32
Bromodichloromethane	0.30 - 0.35
Bromoform	0.30 - 0.34
Bromomethane	0.3
Butanone[2-]	3
Butylbenzene[n-]	0.3
Butylbenzene[sec-]	0.3
Butylbenzene[tert-]	0.3
Carbon Disulfide	0.3
Carbon Tetrachloride	0.30 - 0.32
Chlorobenzene	0.3
Chlorodibromomethane	0.30 - 0.35
Chloroethane	0.30 - 0.32
Chloroform	0.3
Chlorohexane[1-]	0.3
Chloromethane	0.3
Chlorotoluene[2-]	0.3
Chlorotoluene[4-]	0.3
Dibromo-3-Chloropropane[1,2-]	0.40 - 0.66
Dibromoethane[1,2-]	0.3
Dibromomethane	0.30 - 0.31
Dichlorobenzene[1,2-]	0.3
Dichlorobenzene[1,3-]	0.3
Dichlorobenzene[1,4-]	0.3
Dichlorodifluoromethane	0.30 - 0.32
Dichloroethane[1,1-]	0.3
Dichloroethane[1,2-]	0.3
Dichloroethene[1,1-]	0.3
Dichloroethene[cis-1,2-]	0.30 - 0.33
Dichloroethene[trans-1,2-]	0.30 - 0.33
Dichloropropane[1,2-]	0.3
Dichloropropane[1,3-]	0.3

Analyte	MDL (µg/L)
Dichloropropane[2,2-]	0.30 - 0.33
Dichloropropene[1,1-]	0.3
Dichloropropene[cis-1,3-]	0.30 - 0.33
Dichloropropene[trans-1,3-]	0.30 - 0.33
Ethylbenzene	0.30 - 0.31
Hexachlorobutadiene	0.3
Hexanone[2-]	3
Iodomethane	0.30 - 0.38
Isopropylbenzene	0.3
Isopropyltoluene[4-]	0.3
Methyl tert-Butyl Ether	0.30 - 0.31
Methyl-2-pentanone[4-]	3
Methylene Chloride	0.30 - 0.44
Naphthalene	0.3
Propylbenzene[1-]	0.3
Styrene	0.30 - 0.32
Tetrachloroethane[1,1,1,2-]	0.3
Tetrachloroethane[1,1,2,2-]	0.3
Tetrachloroethene	0.20 - 0.3
Toluene	0.30 - 0.31
Trichloro-1,2,2-trifluoroethane[1,1,2-]	0.3
Trichlorobenzene[1,2,3-]	0.3
Trichlorobenzene[1,2,4-]	0.3
Trichloroethane[1,1,1-]	0.3
Trichloroethane[1,1,2-]	0.3
Trichloroethene	0.30 - 0.31
Trichlorofluoromethane	0.30 - 0.31
Trichloropropane[1,2,3-]	0.3
Trimethylbenzene[1,2,4-]	0.3
Trimethylbenzene[1,3,5-]	0.3
Vinyl acetate	0.30 - 0.78
Vinyl Chloride	0.30 - 0.31
Xylene[1,2-]	0.30 - 0.31
Xylene[1,3-]+Xylene[1,4-]	0.30 - 0.31

Table-6

Groundwater Quality Results: Method Detection Limits for High Explosive Compounds (SW-846:8330B)
 SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program
 New Mexico Environment Department DOE Oversight Bureau
 January-May 2017

Analyte	MDL (µg/L)
Amino-2,6-dinitrotoluene[4-]	0.053 - 0.056
Amino-4,6-dinitrotoluene[2-]	0.016 - 0.017
Dinitrobenzene[1,3-]	0.053 - 0.056
Dinitrotoluene[2,4-]	0.053 - 0.056
Dinitrotoluene[2,6-]	0.053 - 0.056
HMX	0.038 - 0.040
Nitrobenzene	0.053 - 0.056
Nitrotoluene[2-]	0.094 - 0.098
Nitrotoluene[3-]	0.061 - 0.063
Nitrotoluene[4-]	0.094 - 0.098
RDX	0.038 - 0.040
Tetryl	0.053 - 0.056
Trinitrobenzene[1,3,5-]	0.033 - 0.035
Trinitrotoluene[2,4,6-]	0.053 - 0.056

Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

New Mexico Environment Department DOE Oversight Bureau

January-May 2017

Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
COYOTE SPRING 2-Feb-17	Actinium-228	16 ± 4.4	18	U	EPA:901.1
	Americium-241	8.6 ± 8.2	27	U	EPA:901.1
	Beryllium-7	4.3 ± 12	41	U	EPA:901.1
	Bismuth-212	40 ± 19	63	U	EPA:901.1
	Bismuth-214	-3.6 ± 6.9	23	U	EPA:901.1
	Cesium-134	1.9 ± 2	6.7	U	EPA:901.1
	Cesium-137	-3 ± 1.4	4.8	U	EPA:901.1
	Cobalt-60	0.076 ± 1.6	5.5	U	EPA:901.1
	Gross alpha	2.6 ± 4.4	15	U	EPA:900
	Gross beta	30 ± 6.8	20		EPA:900
	Iodine-131	0.95 ± 4.5	15	U	EPA:901.1
	Lead-212	2.2 ± 4.1	13	U	EPA:901.1
	Lead-214	0.053 ± 5.6	19	U	EPA:901.1
	Potassium-40	1.9 ± 39	130	U	EPA:901.1
	Protactinium-234m	280 ± 220	730	U	EPA:901.1
	Ra-226	0.16 ± 0.072	0.21	U	EPA:903.1
	Ra-228	1.2 ± 0.23	0.71		EPA:904
	Sodium-22	-1.1 ± 1.7	5.9	U	EPA:901.1
	Thallium-208	2.6 ± 2.3	7.5	U	EPA:901.1
	Thorium-234	-42 ± 42	140	U	EPA:901.1
Uranium-234	11 ± 0.98	0.028		HASL-300:ISOU	
Uranium-235	0.2 ± 0.053	0.067		HASL-300:ISOU	
Uranium-238	2.2 ± 0.23	0.085		HASL-300:ISOU	

U = Result is less than the sample specific Minimum Detectable Activity (MDA).

^a = A negative value indicates that the sample count rate was below that of the instrument background; result is below the Minimum Detectable Activity (MDA).

Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
MRN-3D 10-Feb-17	Actinium-228	11 ± 4.1	18	U	EPA:901.1
	Americium-241	6.1 ± 7.8	26	U	EPA:901.1
	Beryllium-7	13 ± 11	37	U	EPA:901.1
	Bismuth-212	48 ± 20	63	U	EPA:901.1
	Bismuth-214	-4.9 ± 6.9	23	U	EPA:901.1
	Cesium-134	-3 ± 1.4	4.9	U	EPA:901.1
	Cesium-137	-1.9 ± 1.3	4.7	U	EPA:901.1
	Cobalt-60	-0.92 ± 1.6	5.5	U	EPA:901.1
	Gross alpha	3.6 ± 0.5	1.1		EPA:900
	Gross beta	4.3 ± 0.49	1.1		EPA:900
	Iodine-131	0.66 ± 2.9	9.6	U	EPA:901.1
	Lead-212	-2.7 ± 3.9	13	U	EPA:901.1
	Lead-214	-4.5 ± 5.5	18	U	EPA:901.1
	Potassium-40	-59 ± 37	130	U	EPA:901.1
	Protactinium-234m	430 ± 230	760	U	EPA:901.1
	Ra-226	0.26 ± 0.067	0.13		EPA:903.1
	Ra-228	0.2 ± 0.14	0.63	U	EPA:904
	Sodium-22	2.8 ± 1.5	5	U	EPA:901.1
	Thallium-208	0.64 ± 2.3	7.6	U	EPA:901.1
	Thorium-234	-41 ± 41	140	U	EPA:901.1
Uranium-234	3.4 ± 0.34	0.069		HASL-300:ISOU	
Uranium-235	0.12 ± 0.04	0.067		HASL-300:ISOU	
Uranium-238	1.3 ± 0.16	0.028		HASL-300:ISOU	

U = Result is less than the sample specific Minimum Detectable Activity (MDA).

^a = A negative value indicates that the sample count rate was below that of the instrument background; result is below the Minimum Detectable Activity (MDA).

Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
NWT3-MW3D 5-May-17	Actinium-228	-1.4 ± 13	43	U	EPA:901.1
	Americium-241	3.2 ± 8.3	28	U	EPA:901.1
	Beryllium-7	26 ± 12	39	U	EPA:901.1
	Bismuth-212	10 ± 21	70	U	EPA:901.1
	Bismuth-214	18 ± 5.2	20	U	EPA:901.1
	Cesium-134	-4.9 ± 1.6	5.5	U	EPA:901.1
	Cesium-137	1.4 ± 1.5	4.9	U	EPA:901.1
	Cobalt-60	-0.3 ± 1.8	6	U	EPA:901.1
	Gross alpha	3.4 ± 0.44	0.88		EPA:900
	Gross beta	4.6 ± 0.54	1.2		EPA:900
	Iodine-131	-2.3 ± 7.3	24	U	EPA:901.1
	Lead-212	1.5 ± 3.7	12	U	EPA:901.1
	Lead-214	5.7 ± 5.1	17	U	EPA:901.1
	Potassium-40	-35 ± 42	140	U	EPA:901.1
	Protactinium-234m	210 ± 260	860	U	EPA:901.1
	Ra-226	0.073 ± 0.064	0.22	U	EPA:903.1
	Ra-228	0.088 ± 0.16	0.72	U	EPA:904
	Sodium-22	0 ± 1.7	5.9	U	EPA:901.1
	Thallium-208	5.6 ± 1.6	4.8		EPA:901.1
Thorium-234	-10 ± 41	140	U	EPA:901.1	

U = Result is less than the sample specific Minimum Detectable Activity (MDA).

^a = A negative value indicates that the sample count rate was below that of the instrument background; result is below the Minimum Detectable Activity (MDA).

Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

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January-May 2017

Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
PL-2 26-Jan-17	Actinium-228	21 ± 4.9	15		EPA:901.1
	Americium-241	4.9 ± 49	160	U	EPA:901.1
	Beryllium-7	10 ± 11	38	U	EPA:901.1
	Bismuth-212	14 ± 17	57	U	EPA:901.1
	Bismuth-214	0.8 ± 6.1	20	U	EPA:901.1
	Cesium-134	-1 ± 1.3	4.4	U	EPA:901.1
	Cesium-137	0.35 ± 1.3	4.4	U	EPA:901.1
	Cobalt-60	-2.1 ± 1.4	4.9	U	EPA:901.1
	Gross alpha	2.4 ± 0.39	0.96		EPA:900
	Gross beta	4 ± 0.5	1.2		EPA:900
	Iodine-131	-6.2 ± 7.5	26	U	EPA:901.1
	Lead-212	-0.1 ± 4.4	15	U	EPA:901.1
	Lead-214	9.7 ± 2.5	7.7		EPA:901.1
	Potassium-40	-31 ± 40	140	U	EPA:901.1
	Protactinium-234m	390 ± 200	660	U	EPA:901.1
	Ra-226	0.15 ± 0.056	0.14		EPA:903.1
	Ra-228	1.1 ± 0.22	0.64		EPA:904
	Sodium-22	-1.2 ± 1.3	4.5	U	EPA:901.1
Thallium-208	4.3 ± 1.3	4.1		EPA:901.1	
Thorium-234	-1.6 ± 64	210	U	EPA:901.1	

U = Result is less than the sample specific Minimum Detectable Activity (MDA).

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Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

New Mexico Environment Department DOE Oversight Bureau

January-May 2017

Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
PL-4 27-Jan-17	Actinium-228	15 ± 6	19	U	EPA:901.1
	Americium-241	-5.3 ± 15	49	U	EPA:901.1
	Beryllium-7	16 ± 20	68	U	EPA:901.1
	Bismuth-212	7.2 ± 21	70	U	EPA:901.1
	Bismuth-214	0.51 ± 7.2	24	U	EPA:901.1
	Cesium-134	2.3 ± 2.3	7.5	U	EPA:901.1
	Cesium-137	-0.087 ± 1.4	4.7	U	EPA:901.1
	Cobalt-60	-1.6 ± 1.9	6.5	U	EPA:901.1
	Gross alpha	3.2 ± 0.48	1.1		EPA:900
	Gross beta	4.4 ± 0.56	1.4		EPA:900
	Iodine-131	-8.3 ± 8	27	U	EPA:901.1
	Lead-212	-0.93 ± 3.7	12	U	EPA:901.1
	Lead-214	-8.6 ± 5.9	20	U	EPA:901.1
	Potassium-40	-86 ± 49	160	U	EPA:901.1
	Protactinium-234m	400 ± 270	890	U	EPA:901.1
	Ra-226	0.89 ± 0.15	0.076		EPA:903.1
	Ra-228	0.63 ± 0.17	0.64	U	EPA:904
	Sodium-22	0.93 ± 1.8	6	U	EPA:901.1
	Thallium-208	6.5 ± 1.6	4.8		EPA:901.1
Thorium-234	32 ± 38	130	U	EPA:901.1	

U = Result is less than the sample specific Minimum Detectable Activity (MDA).

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Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
SFR-2S 24-Jan-17	Actinium-228	17 ± 5.8	18	U	EPA:901.1
	Americium-241	-4.4 ± 15	49	U	EPA:901.1
	Beryllium-7	5 ± 14	47	U	EPA:901.1
	Bismuth-212	44 ± 22	70	U	EPA:901.1
	Bismuth-214	1.1 ± 6.6	22	U	EPA:901.1
	Cesium-134	-2.8 ± 1.5	5.1	U	EPA:901.1
	Cesium-137	0.84 ± 1.5	4.9	U	EPA:901.1
	Cobalt-60	0.18 ± 1.6	5.5	U	EPA:901.1
	Gross alpha	19 ± 1.9	2.2		EPA:900
	Gross beta	10 ± 1.3	3		EPA:900
	Iodine-131	22 ± 11	36	U	EPA:901.1
	Lead-212	-0.42 ± 3.7	12	U	EPA:901.1
	Lead-214	6.3 ± 3	9.8	U	EPA:901.1
	Potassium-40	-57 ± 53	180	U	EPA:901.1
	Protactinium-234m	230 ± 240	800	U	EPA:901.1
	Ra-226	0.17 ± 0.07	0.19	U	EPA:903.1
	Ra-228	0.91 ± 0.19	0.61		EPA:904
	Sodium-22	2.1 ± 1.4	4.7	U	EPA:901.1
	Thallium-208	3.6 ± 1.6	5	U	EPA:901.1
	Thorium-234	14 ± 46	150	U	EPA:901.1
Uranium-234	19 ± 1.6	0.063		HASL-300:ISOU	
Uranium-235	0.42 ± 0.076	0.061		HASL-300:ISOU	
Uranium-238	5.3 ± 0.48	0.052		HASL-300:ISOU	

U = Result is less than the sample specific Minimum Detectable Activity (MDA).

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Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
SFR-2S 24-Jan-17 (Duplicate)	Actinium-228	18 ± 5.8	18	U	EPA:901.1
	Americium-241	-38 ± 12	42	U	EPA:901.1
	Beryllium-7	36 ± 14	45	U	EPA:901.1
	Bismuth-212	0.79 ± 21	72	U	EPA:901.1
	Bismuth-214	-8.2 ± 7.3	24	U	EPA:901.1
	Cesium-134	-1.6 ± 1.5	5.2	U	EPA:901.1
	Cesium-137	0.055 ± 1.5	5	U	EPA:901.1
	Cobalt-60	0.13 ± 1.8	6.1	U	EPA:901.1
	Gross alpha	18 ± 1.8	2.5		EPA:900
	Gross beta	9.6 ± 1.2	3		EPA:900
	Iodine-131	-10 ± 10	34	U	EPA:901.1
	Lead-212	2.8 ± 3.9	13	U	EPA:901.1
	Lead-214	-9.5 ± 5.9	20	U	EPA:901.1
	Potassium-40	-28 ± 40	140	U	EPA:901.1
	Protactinium-234m	450 ± 250	830	U	EPA:901.1
	Ra-226	0.16 ± 0.063	0.17	U	EPA:903.1
	Ra-228	0.72 ± 0.18	0.63		EPA:904
	Sodium-22	-1.5 ± 1.8	6.1	U	EPA:901.1
	Thallium-208	5.9 ± 1.5	4.7		EPA:901.1
	Thorium-234	9.6 ± 41	140	U	EPA:901.1
Uranium-234	21 ± 1.8	0.11		HASL-300:ISOU	
Uranium-235	0.45 ± 0.096	0.12		HASL-300:ISOU	
Uranium-238	5.5 ± 0.54	0.1		HASL-300:ISOU	

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Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
SFR-4T 25-Jan-17	Actinium-228	16 ± 7.5	24	U	EPA:901.1
	Americium-241	16 ± 17	58	U	EPA:901.1
	Beryllium-7	24 ± 14	45	U	EPA:901.1
	Bismuth-212	53 ± 26	84	U	EPA:901.1
	Bismuth-214	-1.5 ± 9.2	31	U	EPA:901.1
	Cesium-134	0.54 ± 2.6	8.8	U	EPA:901.1
	Cesium-137	-0.66 ± 1.9	6.5	U	EPA:901.1
	Cobalt-60	-0.36 ± 2.4	8.2	U	EPA:901.1
	Gross alpha	-18 ± 4.2	15	U	EPA:900
	Gross beta	-7.3 ± 6	20	U	EPA:900
	Iodine-131	19 ± 11	36	U	EPA:901.1
	Lead-212	6.7 ± 2.3	7.5	U	EPA:901.1
	Lead-214	-7.5 ± 8.2	27	U	EPA:901.1
	Potassium-40	39 ± 53	180	U	EPA:901.1
	Protactinium-234m	430 ± 330	1100	U	EPA:901.1
	Ra-226	0.14 ± 0.066	0.2	U	EPA:903.1
	Ra-228	0.73 ± 0.19	0.7		EPA:904
	Sodium-22	-2 ± 2.5	8.6	U	EPA:901.1
	Thallium-208	5 ± 1.9	6	U	EPA:901.1
	Thorium-234	-77 ± 50	170	U	EPA:901.1
Uranium-234	0.46 ± 0.08	0.06		HASL-300:ISOU	
Uranium-235	0.034 ± 0.024	0.071	U	HASL-300:ISOU	
Uranium-238	0.057 ± 0.031	0.098	U	HASL-300:ISOU	

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Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
SWTA3-MW2 21-Apr-17	Actinium-228	19 ± 5.4	18		EPA:901.1
	Americium-241	-19 ± 16	55	U	EPA:901.1
	Beryllium-7	-6 ± 12	39	U	EPA:901.1
	Bismuth-212	30 ± 21	68	U	EPA:901.1
	Bismuth-214	11 ± 5.8	19	U	EPA:901.1
	Cesium-134	-1 ± 1.9	6.6	U	EPA:901.1
	Cesium-137	-1.8 ± 1.4	4.8	U	EPA:901.1
	Cobalt-60	-1.8 ± 1.7	6.1	U	EPA:901.1
	Gross alpha	4.6 ± 0.5	0.75		EPA:900
	Gross beta	3.4 ± 0.45	1.1		EPA:900
	Iodine-131	-1.2 ± 3.5	12	U	EPA:901.1
	Lead-212	4.1 ± 3.8	13	U	EPA:901.1
	Lead-214	6.9 ± 5.7	19	U	EPA:901.1
	Potassium-40	-13 ± 44	150	U	EPA:901.1
	Protactinium-234m	84 ± 250	850	U	EPA:901.1
	Ra-226	0.16 ± 0.063	0.15		EPA:903.1
	Ra-228	0.19 ± 0.15	0.64	U	EPA:904
	Sodium-22	-0.25 ± 1.7	5.8	U	EPA:901.1
	Thallium-208	4.7 ± 1.5	4.6		EPA:901.1
	Thorium-234	24 ± 38	130	U	EPA:901.1
Uranium-234	3.7 ± 0.35	0.027		HASL-300:ISOU	
Uranium-235	0.082 ± 0.035	0.089	U	HASL-300:ISOU	
Uranium-238	1.1 ± 0.14	0.084		HASL-300:ISOU	

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Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
SWTA3-MW3 24-Feb-17	Actinium-228	7.2 ± 5.4	18	U	EPA:901.1
	Americium-241	17 ± 12	39	U	EPA:901.1
	Beryllium-7	-8.7 ± 13	43	U	EPA:901.1
	Bismuth-212	46 ± 20	65	U	EPA:901.1
	Bismuth-214	10 ± 5.5	18	U	EPA:901.1
	Cesium-134	0.89 ± 2	6.5	U	EPA:901.1
	Cesium-137	2.6 ± 1.5	4.8	U	EPA:901.1
	Cobalt-60	-2.1 ± 1.8	6.2	U	EPA:901.1
	Gross alpha	2 ± 0.44	1.2		EPA:900
	Gross beta	4.8 ± 0.56	1.3		EPA:900
	Iodine-131	6.2 ± 5.3	18	U	EPA:901.1
	Lead-212	-4.4 ± 3.7	12	U	EPA:901.1
	Lead-214	5.8 ± 5.2	17	U	EPA:901.1
	Potassium-40	-16 ± 44	150	U	EPA:901.1
	Protactinium-234m	140 ± 380	1300	U	EPA:901.1
	Ra-226	0.023 ± 0.05	0.19	U	EPA:903.1
	Ra-228	0.25 ± 0.16	0.68	U	EPA:904
	Sodium-22	-3.3 ± 1.7	6.1	U	EPA:901.1
Thallium-208	2.2 ± 1.5	4.8	U	EPA:901.1	
Thorium-234	-2.7 ± 47	150	U	EPA:901.1	

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Table-7

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy, Radium-226, Radium-228 and Isotopic Uranium

SNL/NM Long-Term Stewardship Consolidated Groundwater Monitoring Program

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Monitoring Well/ Sample Date	Analyte	Activity ^a (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
TRE-1 8-Feb-17	Actinium-228	5.3 ± 8.8	29	U	EPA:901.1
	Americium-241	5.5 ± 2.6	8.4	U	EPA:901.1
	Beryllium-7	3 ± 8.6	29	U	EPA:901.1
	Bismuth-212	-3.2 ± 38	130	U	EPA:901.1
	Bismuth-214	25 ± 5.9	19		EPA:901.1
	Cesium-134	0.82 ± 1.1	3.8	U	EPA:901.1
	Cesium-137	0.92 ± 1.1	3.8	U	EPA:901.1
	Cobalt-60	-0.88 ± 1.4	4.7	U	EPA:901.1
	Gross alpha	22 ± 2.2	2.8		EPA:900
	Gross beta	7.3 ± 1.3	3.5		EPA:900
	Iodine-131	2 ± 2.4	7.9	U	EPA:901.1
	Lead-212	1 ± 3	10	U	EPA:901.1
	Lead-214	23 ± 4.2	15		EPA:901.1
	Potassium-40	-27 ± 31	110	U	EPA:901.1
	Protactinium-234m	290 ± 190	640	U	EPA:901.1
	Ra-226	0.24 ± 0.075	0.16		EPA:903.1
	Ra-228	0.64 ± 0.2	0.75	U	EPA:904
	Sodium-22	0.34 ± 1.2	4.2	U	EPA:901.1
	Thallium-208	-1.4 ± 2.6	8.8	U	EPA:901.1
	Thorium-234	-0.68 ± 21	71	U	EPA:901.1
Uranium-234	22 ± 1.8	0.083		HASL-300:ISOU	
Uranium-235	0.33 ± 0.072	0.086		HASL-300:ISOU	
Uranium-238	5.4 ± 0.51	0.03		HASL-300:ISOU	

U = Result is less than the sample specific Minimum Detectable Activity (MDA).

^a = A negative value indicates that the sample count rate was below that of the instrument background; result is below the Minimum Detectable Activity (MDA).