



SUSANA MARTINEZ  
Governor

JOHN A. SANCHEZ  
Lt. Governor

NEW MEXICO  
ENVIRONMENT DEPARTMENT

*DOE Oversight Bureau*

121 Tijeras Ave., NE Suite 1000  
Albuquerque, NM  
Phone (505) 383-2073 Fax (505) 222-9510  
www.env.nm.gov



BUTCH TONGATE  
Cabinet Secretary

J. C. BORREGO  
Deputy Secretary

February 14, 2018

Steven Black  
Point of Contact  
Water Quality Program Manager  
U.S. Department of Energy  
Sandia Field Office  
P.O Box 5400 MS 0184  
Albuquerque, New Mexico 87185-5400

**Subject: Data Submittal for Groundwater Monitoring at Sandia National Laboratories/New Mexico Technical Area-V Groundwater Area of Concern Conducted by the New Mexico Environment Department DOE Oversight Bureau for FFY 2017 Q-4**

Mr. Black:

This letter transmits the subject report as final. The report shows groundwater data results from Technical Area-V Groundwater Area of Concern collected by the New Mexico Environment Department DOE Oversight Bureau during the fourth quarter of FFY 2017.

The enclosed monitoring results were provided to the U.S Department of Energy in draft form on January 3, 2018 for 30-day review and comment. The final monitoring results are provided to DOE, other State of New Mexico and federal agencies, the NMED website, and interested members of the public. If you have any questions, or if you would like copies of the complete data set, please contact me by phone at (505) 383-2070 or by email at [chris.armijo1@state.nm.us](mailto:chris.armijo1@state.nm.us) or by mail to the address in the above letterhead.

Sincerely,

Chris Armijo  
Environmental Scientist  
Sandia Oversight Section

Enclosure: (1) Groundwater Monitoring at Sandia National Laboratories/New Mexico  
Technical Area-V Groundwater Area of Concern Conducted by the New  
Mexico Environment Department DOE Oversight Bureau for FFY 2017 Q-4  
(2) Table-1 Total Target Analyte List Metals Plus Uranium Results  
(3) Table-2 Major Anions, Nitrate-Nitrite as Nitrogen and Perchlorate Results  
(4) Table-3 Detected Volatile Organic Compound Results  
(5) Table-4 Method Detection Limits for Volatile Organic Compounds  
(6) Table-5 Gross Alpha, Gross Beta, Gamma Spectroscopy and Tritium Results

Distribution: David Rast, DOE/SFO  
Michael Skelly, SNL/NM Groundwater  
Tim Jackson, SNL/NM Groundwater  
Jennifer Hart, Sandia Staff Manager, DOE OB  
Susan Lucas Kamat, Bureau Chief, DOE OB

File: SGE42. Groundwater Monitoring. TAV AOC. FFY 2017 Q-4

**DOE Oversight Bureau, New Mexico Environment Department**

**Groundwater Monitoring at  
Sandia National Laboratories/New Mexico  
Technical Area-V Groundwater  
Area of Concern**

**Conducted by the  
New Mexico Environment Department DOE Oversight Bureau  
for FFY 2017 Q-4**

**Prepared by Chris Armijo, Environmental Scientist  
Sandia Oversight Section  
121 Tijeras Ave., NE Suite 1000  
Albuquerque, NM 87102  
(505) 383-2070  
chris.armijo1@state.nm.us**

**Final Report**

**2/14/2018**

---

The purpose of this communication is to transmit groundwater quality data collected by New Mexico Environment Department DOE Oversight Bureau from Technical Area-V Groundwater Area of Concern during the fourth quarter of Federal Fiscal Year 2017.

Acknowledgment:

This material is based upon work supported by the Department of Energy Office of Environmental Management under Award Number *DE-EM0002420*.

Disclaimer:

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

## **Introduction**

The New Mexico Environment Department (NMED) DOE Oversight Bureau (DOE-OB or Bureau) has compiled and assessed groundwater data collected during July and August 2017. The Bureau collected groundwater samples from Technical Area-V (TAV) Groundwater Area of Concern (AOC) monitoring wells LWDS-MW1, TAV-MW6, TAV-MW8, TAV-MW10, TAV-MW12, TAV-MW14, TAV-MW15 and TAV-MW16 (plus duplicate). Split samples were collected using standard Sandia National Laboratories/New Mexico (SNL/NM) sampling procedures and equipment. Samples collected from TAV-MW15 and TAV-MW16 wells were analyzed for metals, anions, perchlorate, nitrate-nitrite as nitrogen (N), volatile organic compounds (VOCs) and radionuclides. Samples collected from LWDS-MW1, TAV-MW6, TAV-MW8, TAV-MW10, TAV-MW12, and TAV-MW14 wells were analyzed for nitrate-nitrite as N and VOCs only. The Bureau used ALS Environmental Laboratory located in Fort Collins, Colorado to analyze and report data results from samples collected at TAV AOC. ALS Environmental is an independent analytical laboratory under contract with the NMED.

Nitrate levels exceeded the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL), or drinking water standard of 10 mg/L at monitoring wells LWDS-MW1 and TAV-MW10. Trichloroethene (TCE) concentrations also exceeded the EPA MCL of 5 µg/L at monitoring wells LWDS-MW1, TAV-MW6, TAV-MW10, TAV-MW12 and TAV-MW14.

## **Data Assessment**

All groundwater samples were collected and analyzed in accordance with U.S. EPA protocols. Data results are compared to applicable 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 total (unfiltered) target analyte list (TAL) metals plus uranium are presented in Table-1. All metal concentrations were below established MCLs.

Analytical results for anions (bromide, chloride, fluoride and sulfate), nitrate-nitrite as N and perchlorate are summarized in Table-2. All anions were below MCLs. Nitrate levels exceeded the EPA MCL of 10 milligrams per liter (mg/L) at monitoring wells LWDS-MW1 (12 mg/L) and TAV-MW10 (12 mg/L). All other samples analyzed for nitrates were detected below the EPA MCL. Perchlorate was not detected above the laboratory method detection limit (MDL)

VOCs detected at concentrations above the MDL are listed in Table-3. Compounds detected above the laboratory MDLs include dichloroethene [cis-,

2-], toluene, and TCE. No VOCs were detected above their associated MCL, except for TCE. TCE was detected above the EPA MCL of 5 micrograms per liter ( $\mu\text{g/L}$ ) at TAV monitoring wells LWDS-MW1 (19  $\mu\text{g/L}$ ), TAV-MW6 (11  $\mu\text{g/L}$ ), TAV-MW10 (11  $\mu\text{g/L}$ ), TAV-MW12 (6.3  $\mu\text{g/L}$ ) and TAV-MW14 (5.8  $\mu\text{g/L}$ ). Table-4 summarizes the laboratory MDLs for the remaining VOCs analyzed from samples collected at TAV.

Analytical results for radionuclides are presented in Table-5 and used to screen for potential radiological contamination. Samples were analyzed for gross alpha, gross beta, gamma emitting isotopes and tritium. All radionuclide results were below established EPA MCLs.

### **Conclusion**

The DOE-OB collected split samples from a total of eight (8) TAV groundwater monitoring wells during the fourth quarter of FFY 2017. Samples were analyzed by ALS Environmental for metals, anions, nitrates, VOCs and radionuclides. Nitrate concentrations exceeded the EPA MCL of 10 mg/L in samples collected from monitoring wells LWDS-MW1 and TAV-MW10. TCE concentrations also exceeded the EPA MCL of 5  $\mu\text{g/L}$  at monitoring wells LWDS-MW1, TAV-MW6, TAV-MW10, TAV-MW12 and TAV-MW14.

Both nitrate and TCE have been identified as contaminants of concern at TAV. Historically, nitrate and TCE have been detected above the EPA drinking water standards in several wells and the Bureau's results for this reporting period are consistent with past results.

The DOE-OB will continue to collect split samples with SNL/NM from TAV groundwater monitoring wells and continue to independently monitor TAV wells for contaminants of concern.

Table-1

Groundwater Quality Results: Total Target Analyte List Metals plus Uranium

SNL/NM Technical Area-V Groundwater Monitoring

New Mexico Environment Department DOE Oversight Bureau

July-August 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
TAV-MW15 27-Jul-17	Aluminum	0.028	NE	0.1	0.014	JB	SW-846:6020
	Antimony	0.0003	0.006	0.001	0.0003	U	SW-846:6020
	Arsenic	0.0006	0.01	0.002	0.0006	U	SW-846:6020
	Barium	0.078	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	75	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	25	NE	0.1	0.03	B	SW-846:6020
	Manganese	0.012	NE	0.005	0.0015		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	69	NE	1	0.3		SW-846:6020
Thallium	0.000084	0.002	0.0001	0.00008	U	SW-846:6020	
Uranium	0.0073	0.03	0.0001	0.00003		SW-846:6020	
Vanadium	0.0015	NE	0.005	0.0015	U	SW-846:6020	
Zinc	0.048	NE	0.1	0.048	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

U = the analyte was analyzed for but not detected

Table-1

Groundwater Quality Results: Total Target Analyte List Metals plus Uranium

SNL/NM Technical Area-V Groundwater Monitoring

New Mexico Environment Department DOE Oversight Bureau

July-August 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
TAV-MW16 28-Jul-17	Aluminum	0.034	NE	0.1	0.014	JB	SW-846:6020
	Antimony	0.0003	0.006	0.001	0.0003	U	SW-846:6020
	Arsenic	0.0006	0.01	0.002	0.0006	U	SW-846:6020
	Barium	0.078	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	83	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	29	NE	0.1	0.03	B	SW-846:6020
	Manganese	0.0025	NE	0.005	0.0015	J	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	4.7	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	74	NE	1	0.3		SW-846:6020
Thallium	0.000084	0.002	0.0001	0.000084	U	SW-846:6020	
Uranium	0.0067	0.03	0.0001	0.00003		SW-846:6020	
Vanadium	0.0043	NE	0.005	0.0015	J	SW-846:6020	
Zinc	0.048	NE	0.1	0.048	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

U = the analyte was analyzed for but not detected



Table-1

Groundwater Quality Results: Total Target Analyte List Metals plus Uranium

SNL/NM Technical Area-V Groundwater Monitoring

New Mexico Environment Department DOE Oversight Bureau

July-August 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
TAV-MW16 28-Jul-17 DUP	Aluminum	0.032	NE	0.1	0.014	JB	SW-846:6020
	Antimony	0.0003	0.006	0.001	0.0003	U	SW-846:6020
	Arsenic	0.00067	0.01	0.002	0.0006	J	SW-846:6020
	Barium	0.075	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	82	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	0.031	NE	0.1	0.03	J	SW-846:6020
	Lead	0.00085	NE	0.002	0.00085	U	SW-846:6020
	Magnesium	28	NE	0.1	0.03	B	SW-846:6020
	Manganese	0.0025	NE	0.005	0.0015	J	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	4.6	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	73	NE	1	0.3		SW-846:6020
Thallium	0.000084	0.002	0.0001	0.000084	U	SW-846:6020	
Uranium	0.0068	0.03	0.0001	0.00003		SW-846:6020	
Vanadium	0.0041	NE	0.005	0.0015	J	SW-846:6020	
Zinc	0.048	NE	0.1	0.048	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

U = the analyte was analyzed for but not detected

Table-2

Groundwater Quality Results: Major Anions, Nitrate-Nitrite as N, and Perchlorate  
 SNL/NM Technical Area-V Groundwater Monitoring  
 New Mexico Environment Department DOE Oversight Bureau  
 July-August 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
<b>LWDS-MW1</b> 7-Aug-17	Nitrate-Nitrite as Nitrogen	12	10	0.5	0.15		EPA:353.2
<b>TAV-MW6</b> 10-Aug-17	Nitrate-Nitrite as Nitrogen	8	10	0.5	0.15		EPA:353.2
<b>TAV-MW8</b> 3-Aug-17	Nitrate-Nitrite as Nitrogen	6.5	10	0.5	0.15		EPA:353.2
<b>TAV-MW10</b> 11-Aug-17	Nitrate-Nitrite as Nitrogen	12	10	0.5	0.15		EPA:353.2
<b>TAV-MW12</b> 8-Aug-17	Nitrate-Nitrite as Nitrogen	6.7	10	0.5	0.15		EPA:353.2
<b>TAV-MW14</b> 9-Aug-17	Nitrate-Nitrite as Nitrogen	9.1	10	0.5	0.15		EPA:353.2
<b>TAV-MW15</b> 27-Jul-17	Bromide	1	NE	1	0.3	UH	EPA:300.0
	Chloride	81	NE	1	0.3		EPA:300.0
	Fluoride	0.93	NE	0.5	0.15		EPA:300.0
	Nitrate-Nitrite as Nitrogen	1.8	10	0.01	0.003		EPA:353.2
	Perchlorate	0.0012	NE	0.004	0.0012	U	EPA:314.0
	Sulfate	55	NE	5	0.75		EPA:300.0
<b>TAV-MW16</b> 28-Jul-17	Bromide	1	NE	1	0.3	UH	EPA:300.0
	Chloride	92	NE	1	0.3		EPA:300.0
	Fluoride	0.9	NE	0.5	0.15		EPA:300.0
	Nitrate-Nitrite as Nitrogen	2.2	10	0.1	0.03		EPA:353.2
	Perchlorate	0.0012	NE	0.004	0.0012	U	EPA:314.0
	Sulfate	62	NE	5	0.75		EPA:300.0
<b>TAV-MW16</b> 28-Jul-17 DUP	Bromide	1	NE	1	0.3	UH	EPA:300.0
	Chloride	92	NE	1	0.3		EPA:300.0
	Fluoride	0.87	NE	0.5	0.15		EPA:300.0
	Nitrate-Nitrite as Nitrogen	2.3	10	0.1	0.03		EPA:353.2
	Perchlorate	0.0012	NE	0.004	0.0012	U	EPA:314.0
	Sulfate	52	NE	5	0.75		EPA:300.0

H = Analytical holding time was exceeded.

NE = Not Established

U = the analyte was analyzed for but not detected

Table-3

Groundwater Quality Results: Detected Volatile Organic Compounds  
 SNL/NM Technical Area-V Groundwater Monitoring  
 New Mexico Environment Department DOE Oversight Bureau  
 July-August 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
<b>LWDS-MW1</b> 7-Aug-17	Dichloroethene[cis-1,2-]	4.4	70	1	0.33		SW-846:8260B_25
	Toluene	0.35	1000	1	0.31	J	SW-846:8260B_25
	Trichloroethene	<b>19</b>	5	1	0.31		SW-846:8260B_25
<b>TAV-MW6</b> 10-Aug-17	Dichloroethene[cis-1,2-]	2	70	1	0.33		SW-846:8260B_25
	Trichloroethene	<b>11</b>	5	1	0.31		SW-846:8260B_25
<b>TAV-MW8</b> 3-Aug-17	Dichloroethene[cis-1,2-]	0.42	70	1	0.33	J	SW-846:8260B_25
	Trichloroethene	4.1	5	1	0.31		SW-846:8260B_25
<b>TAV-MW10</b> 11-Aug-17	Dichloroethene[cis-1,2-]	2.1	70	1	0.33		SW-846:8260B_25
	Trichloroethene	<b>11</b>	5	1	0.31		SW-846:8260B_25
<b>TAV-MW12</b> 8-Aug-17	Dichloroethene[cis-1,2-]	0.34	70	1	0.33	J	SW-846:8260B_25
	Trichloroethene	<b>6.3</b>	5	1	0.31		SW-846:8260B_25
<b>TAV-MW14</b> 9-Aug-17	Dichloroethene[cis-1,2-]	0.71	70	1	0.33	J	SW-846:8260B_25
	Trichloroethene	<b>5.8</b>	5	1	0.31		SW-846:8260B_25
<b>TAV-MW16</b> 28-Jul-17	Trichloroethene	0.44	5	1	0.31	J	SW-846:8260B_25
<b>TAV-MW16</b> 28-Jul-17 DUP	Trichloroethene	0.4	5	1	0.31	J	SW-846:8260B_25

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

Table-4

Groundwater Quality Results: Method Detection Limits for Volatile Organic Compounds (SW-846:8260B)  
 SNL/NM Technical Area-V Groundwater Monitoring  
 New Mexico Environment Department DOE Oversight Bureau  
 July-August 2017

Analyte	MDL (µg/L)
Acetone	3
Benzene	0.32
Bromobenzene	0.3
Bromochloromethane	0.32
Bromodichloromethane	0.35
Bromoform	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	0.32
Chlorobenzene	0.3
Chlorodibromomethane	0.35
Chloroethane	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-]	0.66
Dibromoethane[1,2-]	0.3
Dibromomethane	0.31
Dichlorobenzene[1,2-]	0.3
Dichlorobenzene[1,3-]	0.3
Dichlorobenzene[1,4-]	0.3
Dichlorodifluoromethane	0.32
Dichloroethane[1,1-]	0.3
Dichloroethane[1,2-]	0.3
Dichloroethene[1,1-]	0.3
Dichloroethene[cis-1,2-]	0.33
Dichloroethene[trans-1,2-]	0.33
Dichloropropane[1,2-]	0.3
Dichloropropane[1,3-]	0.3

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

Table-5

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy and Tritium  
 SNL/NM Technical Area-V Groundwater Monitoring  
 New Mexico Environment Department DOE Oversight Bureau  
 July-August 2017

Monitoring Well/ Sample Date	Analyte	Activity <sup>a</sup> (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
TAV-MW15 27-Jul-17	Actinium-228	12 ± 4.8	18	U	EPA:901.1
	Americium-241	-13 ± 47	160	U	EPA:901.1
	Beryllium-7	8.1 ± 11	38	U	EPA:901.1
	Bismuth-212	18 ± 18	59	U	EPA:901.1
	Bismuth-214	8 ± 6.3	21	U	EPA:901.1
	Cesium-134	-3.3 ± 1.4	4.7	U	EPA:901.1
	Cesium-137	-0.66 ± 1.2	4.2	U	EPA:901.1
	Cobalt-60	-1.9 ± 1.5	5.1	U	EPA:901.1
	Gross alpha	7.3 ± 0.9	1.6		EPA:900
	Gross beta	4.7 ± 0.76	2.1		EPA:900
	Iodine-131	3.3 ± 7.1	23	U	EPA:901.1
	Lead-212	-4.4 ± 4.4	15	U	EPA:901.1
	Lead-214	4.8 ± 4.6	15	U	EPA:901.1
	Potassium-40	0.047 ± 42	140	U	EPA:901.1
	Protactinium-234m	260 ± 220	730	U	EPA:901.1
	Sodium-22	1 ± 1.4	4.7	U	EPA:901.1
	Thallium-208	-0.46 ± 3.2	11	U	EPA:901.1
	Thorium-234	50 ± 50	160	U	EPA:901.1
Tritium	72 ± 97	320	U	EPA:906.0	

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

<sup>a</sup> = 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-5

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy and Tritium  
 SNL/NM Technical Area-V Groundwater Monitoring  
 New Mexico Environment Department DOE Oversight Bureau  
 July-August 2017

Monitoring Well/ Sample Date	Analyte	Activity <sup>a</sup> (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
TAV-MW16 28-Jul-17	Actinium-228	15 ± 26	87	U	EPA:901.1
	Americium-241	16 ± 9	29	U	EPA:901.1
	Beryllium-7	-0.37 ± 12	40	U	EPA:901.1
	Bismuth-212	26 ± 20	67	U	EPA:901.1
	Bismuth-214	12 ± 7.2	24	U	EPA:901.1
	Cesium-134	2.5 ± 1.1	4.1	U	EPA:901.1
	Cesium-137	-1.5 ± 1.4	4.8	U	EPA:901.1
	Cobalt-60	-0.69 ± 1.8	6.3	U	EPA:901.1
	Gross alpha	7.3 ± 0.95	1.8		EPA:900
	Gross beta	4.2 ± 0.81	2.3		EPA:900
	Iodine-131	6.6 ± 4.3	14	U	EPA:901.1
	Lead-212	1.4 ± 4.2	14	U	EPA:901.1
	Lead-214	3.8 ± 4.8	16	U	EPA:901.1
	Potassium-40	65 ± 46	150	U	EPA:901.1
	Protactinium-234m	450 ± 260	850	U	EPA:901.1
	Sodium-22	0.72 ± 1.8	5.9	U	EPA:901.1
	Thallium-208	0.56 ± 2.7	8.8	U	EPA:901.1
	Thorium-234	9.8 ± 38	120	U	EPA:901.1
Tritium	-11 ± 94	320	U	EPA:906.0	

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

<sup>a</sup> = 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-5

Groundwater Quality Results: Gross Alpha, Gross Beta, Gamma Spectroscopy and Tritium  
 SNL/NM Technical Area-V Groundwater Monitoring  
 New Mexico Environment Department DOE Oversight Bureau  
 July-August 2017

Monitoring Well/ Sample Date	Analyte	Activity <sup>a</sup> (pCi/L)	MDA (pCi/L)	Laboratory Qualifier	Analytical Method
TAV-MW16 28-Jul-17 DUP	Actinium-228	17 ± 7.3	23	U	EPA:901.1
	Americium-241	11 ± 6.7	22	U	EPA:901.1
	Beryllium-7	44 ± 14	46	U	EPA:901.1
	Bismuth-212	37 ± 24	79	U	EPA:901.1
	Bismuth-214	5.8 ± 7.3	24	U	EPA:901.1
	Cesium-134	7.6 ± 1.7	5		EPA:901.1
	Cesium-137	-4.6 ± 1.8	6.3	U	EPA:901.1
	Cobalt-60	2.2 ± 2.2	7.3	U	EPA:901.1
	Gross alpha	5.6 ± 0.92	2.3		EPA:900
	Gross beta	5.2 ± 0.82	2.2		EPA:900
	Iodine-131	-3.2 ± 5.7	20	U	EPA:901.1
	Lead-212	-1.9 ± 4.5	15	U	EPA:901.1
	Lead-214	6.5 ± 3.4	13	U	EPA:901.1
	Potassium-40	-15 ± 57	190	U	EPA:901.1
	Protactinium-234m	130 ± 310	1000	U	EPA:901.1
	Sodium-22	2.8 ± 2.1	6.8	U	EPA:901.1
	Thallium-208	4.1 ± 1.8	5.9	U	EPA:901.1
	Thorium-234	11 ± 43	140	U	EPA:901.1
Tritium	49 ± 95	320	U	EPA:906.0	

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

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