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November 26, 2018

Steven Black
Point of Contact
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Subject: Data Submittal for Groundwater Monitoring at Sandia National Laboratories/New Mexico Chemical Waste Landfill Conducted by the New Mexico Environment Department DOE Oversight Bureau for FFY 2018 Q-4

Mr. Black:

This letter transmits the subject report as final. The report shows groundwater data results from Chemical Waste Landfill collected by the New Mexico Environment Department DOE Oversight Bureau during the fourth quarter of FFY 2018.

The enclosed monitoring results were provided to the U.S Department of Energy in draft form on October 16, 2018 for 30-day review and comment. The final monitoring results are provided to DOE, the State of New Mexico and other 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, by email at chris.armijo1@state.nm.us, or by mail to the address in the above letterhead.

Sincerely,

A handwritten signature in blue ink that reads "Chris Armijo".

Chris Armijo
NMED DOE Oversight Bureau
Sandia Oversight Section

Enclosure: (1) Groundwater Monitoring at Sandia National Laboratories/New Mexico Chemical Waste Landfill Conducted by the New Mexico Environment Department DOE Oversight Bureau for FFY 2018 Q-4
(2) Table-1 Total Target Analyte List Metals Results
(3) Table-2 Detected Volatile Organic Compounds Results
(4) Table-3 Method Detection Limits for Volatile Organic Compounds

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File: SGE42. Groundwater Monitoring. CWL. FFY 2018 Q-4

DOE Oversight Bureau, New Mexico Environment Department

**Groundwater Monitoring at
Sandia National Laboratories/New Mexico
Chemical Waste Landfill**

**Conducted by the
New Mexico Environment Department DOE Oversight Bureau
for FFY 2018 Q-4**

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Final Report

11/26/2018

The purpose of this communication is to transmit groundwater quality data collected by the New Mexico Environment Department DOE Oversight Bureau from Sandia National Laboratories/New Mexico Chemical Waste Landfill during the fourth quarter of Federal Fiscal Year 2018.

Acknowledgment:

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Disclaimer:

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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 July 2018. The Bureau collected groundwater samples from Chemical Waste Landfill (CWL) groundwater monitoring wells CWL-BW5, CWL-MW9 (plus duplicate), CWL-MW10 and CWL-MW11. Split samples were collected using standard Sandia National Laboratories/New Mexico (SNL/NM) sampling procedures and equipment in accordance with the CWL Post-Closure Care Permit (PCCP) Groundwater Sampling and Analysis Plan (SAP). Samples were analyzed for total target analyte list (TAL) metals and volatile organic compounds (VOCs). The Bureau submitted samples for analysis to an independent analytical laboratory under contract with the NMED.

No sample concentrations exceeded established U.S. Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCLs) or concentration limits for the hazardous constituents of concern listed in the CWL PCCP.

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. Sample results are also compared to Chemical Waste Landfill Groundwater Concentration Limits for Hazardous Constituents of Concern (COC) in the PCCP, Table 1-2 of the Post-Closure Care Plan for the CWL, Permit Attachment 1 (NMED October 2009).

Under the current PCCP, SNL/NM is required to collect samples from CWL monitoring wells CWL-BW5, CWL-MW9, CWL-MW10 and CWL-MW11. Samples are analyzed for trichloroethene (TCE) and metals (chromium and nickel).

Results

Analytical results for total TAL metals are presented in Table-1. Metals concentrations for chromium and nickel were below established MCLs and PCCP concentration limits; all other metals concentrations were below established MCLs. In accordance with the CWL PCCP, SNL/NM only analyzes groundwater samples for the metals chromium and nickel. The CWL PCCP concentration limits for chromium and nickel are 0.050 mg/L and 0.028 mg/L, respectively.

Volatile organic compounds detected at concentrations above the method detection limits (MDLs) are presented in Table-2. Trichloroethene (TCE) was detected above the MDL at monitoring well CWL-MW10 at a concentration of 0.68 µg/L. The result was "J" flagged, indicating that the result was an estimated value. The TCE concentration was below the EPA MCL and CWL PCCP limit of

5 µg/L. Table-3 summarizes laboratory MDLs for the remaining VOCs analyzed from the samples collected at CWL monitoring wells.

Conclusion

Groundwater samples were collected from four (4) monitoring wells during this semi-annual sampling event at the CWL. Samples collected by the Bureau reported concentrations of metals and VOCs below established EPA MCLs and SNL/NM COC concentration limits listed in the PCCP. Groundwater results collected by DOE-OB are comparable to historical results.

The DOE-OB will continue to monitor groundwater quality at the CWL and make the data reports available to the public.

References

New Mexico Environment Department (NMED), October 2009. "Resource Conservation and Recovery Act, Post-Closure Care Permit, EPA ID No. NM5890110518, to the U.S. Department of Energy/Sandia Corporation, for the Sandia National Laboratories Chemical Waste Landfill," New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico, October 15, 2009.

Sandia National Laboratories/New Mexico (SNL/NM). "Annual Groundwater Monitoring Report Calendar Year 2017." Sandia National Laboratories, Albuquerque, New Mexico.

Sandia National Laboratories/New Mexico (SNL/NM), March 2017. "Chemical Waste Landfill Annual Post-Closure Care Report Calendar Year 2016," Sandia National Laboratories, Albuquerque, New Mexico.

U.S. EPA National Primary Drinking Water Regulations (40 CFR 141), National Primary Drinking Water Standards, EPA, July 2002.

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Table-1

Groundwater Quality Monitoring Results: Total Target Analyte List Metals

New Mexico Environment Department DOE Oversight Bureau

Sandia National Laboratories/New Mexico: Chemical Waste Landfill

July 2018

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	CWL PCCP Limits (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
CWL-BW5 17-Jul-18	Aluminum	0.033	NE	NE	0.1	0.01	J	SW846:6020
	Antimony	0.00012	0.006	NE	0.001	0.00012	U	SW846:6020
	Arsenic	0.00039	0.01	NE	0.002	0.00039	U	SW846:6020
	Barium	0.059	2	NE	0.005	0.00056		SW846:6020
	Beryllium	0.000054	0.004	NE	0.0005	0.000054	U	SW846:6020
	Cadmium	0.000083	0.005	NE	0.002	0.000083	U	SW846:6020
	Calcium	110	NE	NE	1	0.085		SW846:6020
	Chromium	0.0074	0.10	0.050	0.01	0.00046	J	SW846:6020
	Cobalt	0.00011	NE	NE	0.005	0.00011	U	SW846:6020
	Copper	0.00032	NE	NE	0.02	0.00032	U	SW846:6020
	Iron	0.029	NE	NE	0.1	0.0098	J	SW846:6020
	Lead	0.000079	NE	NE	0.002	0.000079	U	SW846:6020
	Magnesium	26	NE	NE	0.1	0.016		SW846:6020
	Manganese	0.009	NE	NE	0.005	0.00036		SW846:6020
	Mercury	0.00006	0.002	NE	0.0001	0.00006	U	SW846:7470A
	Nickel	0.0017	NE	0.028	0.02	0.00092	J	SW846:6020
	Potassium	6.2	NE	NE	1	0.039		SW846:6020
	Selenium	0.002	0.05	NE	0.01	0.00065	J	SW846:6020
	Silver	0.000029	NE	NE	0.0005	0.000029	U	SW846:6020
	Sodium	85	NE	NE	1	0.022		SW846:6020
Thallium	0.0000041	0.002	NE	0.0001	0.0000041	U	SW846:6020	
Vanadium	0.0018	NE	NE	0.005	0.00012	J	SW846:6020	
Zinc	0.0014	NE	NE	0.1	0.0014	U	SW846:6020	

J = the reported value was obtained from a reading that was less than the Quantitation 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 Monitoring Results: Total Target Analyte List Metals

New Mexico Environment Department DOE Oversight Bureau

Sandia National Laboratories/New Mexico: Chemical Waste Landfill

July 2018

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	CWL PCCP Limits (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
CWL-MW9 18-Jul-18	Aluminum	0.015	NE	NE	0.1	0.01	J	SW846:6020
	Antimony	0.00012	0.006	NE	0.001	0.00012	U	SW846:6020
	Arsenic	0.00039	0.01	NE	0.002	0.00039	U	SW846:6020
	Barium	0.085	2	NE	0.005	0.00056		SW846:6020
	Beryllium	0.000054	0.004	NE	0.0005	0.000054	U	SW846:6020
	Cadmium	0.000083	0.005	NE	0.002	0.000083	U	SW846:6020
	Calcium	100	NE	NE	1	0.085		SW846:6020
	Chromium	0.0084	0.10	0.050	0.01	0.00046	J	SW846:6020
	Cobalt	0.00011	NE	NE	0.005	0.00011	U	SW846:6020
	Copper	0.00032	NE	NE	0.02	0.00032	U	SW846:6020
	Iron	0.037	NE	NE	0.1	0.0098	J	SW846:6020
	Lead	0.000079	NE	NE	0.002	0.000079	U	SW846:6020
	Magnesium	26	NE	NE	0.1	0.016		SW846:6020
	Manganese	0.015	NE	NE	0.005	0.00036		SW846:6020
	Mercury	0.00006	0.002	NE	0.0001	0.00006	U	SW846:7470A
	Nickel	0.0024	NE	0.028	0.02	0.00092	J	SW846:6020
	Potassium	7.6	NE	NE	1	0.039		SW846:6020
	Selenium	0.0017	0.05	NE	0.01	0.00065	J	SW846:6020
	Silver	0.000029	NE	NE	0.0005	0.000029	U	SW846:6020
	Sodium	72	NE	NE	1	0.022		SW846:6020
Thallium	0.00002	0.002	NE	0.0001	0.0000041	J	SW846:6020	
Vanadium	0.0019	NE	NE	0.005	0.00012	J	SW846:6020	
Zinc	0.0014	NE	NE	0.1	0.0014	U	SW846:6020	

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Table-1

Groundwater Quality Monitoring Results: Total Target Analyte List Metals

New Mexico Environment Department DOE Oversight Bureau

Sandia National Laboratories/New Mexico: Chemical Waste Landfill

July 2018

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	CWL PCCP Limits (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
CWL-MW9 18-Jul-18 (Duplicate)	Aluminum	0.015	NE	NE	0.1	0.01	J	SW846:6020
	Antimony	0.00012	0.006	NE	0.001	0.00012	U	SW846:6020
	Arsenic	0.00042	0.01	NE	0.002	0.00039	J	SW846:6020
	Barium	0.085	2	NE	0.005	0.00056		SW846:6020
	Beryllium	0.000054	0.004	NE	0.0005	0.000054	U	SW846:6020
	Cadmium	0.000083	0.005	NE	0.002	0.000083	U	SW846:6020
	Calcium	100	NE	NE	1	0.085		SW846:6020
	Chromium	0.0079	0.10	0.050	0.01	0.00046	J	SW846:6020
	Cobalt	0.00011	NE	NE	0.005	0.00011	U	SW846:6020
	Copper	0.00032	NE	NE	0.02	0.00032	U	SW846:6020
	Iron	0.04	NE	NE	0.1	0.0098	J	SW846:6020
	Lead	0.000079	NE	NE	0.002	0.000079	U	SW846:6020
	Magnesium	26	NE	NE	0.1	0.016		SW846:6020
	Manganese	0.018	NE	NE	0.005	0.00036		SW846:6020
	Mercury	0.00006	0.002	NE	0.0001	0.00006	U	SW846:7470A
	Nickel	0.0024	NE	0.028	0.02	0.00092	J	SW846:6020
	Potassium	7.6	NE	NE	1	0.039		SW846:6020
	Selenium	0.0021	0.05	NE	0.01	0.00065	J	SW846:6020
	Silver	0.000029	NE	NE	0.0005	0.000029	U	SW846:6020
	Sodium	71	NE	NE	1	0.022		SW846:6020
Thallium	0.00002	0.002	NE	0.0001	0.0000041	J	SW846:6020	
Vanadium	0.002	NE	NE	0.005	0.00012	J	SW846:6020	
Zinc	0.0014	NE	NE	0.1	0.0014	U	SW846:6020	

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Table-1

Groundwater Quality Monitoring Results: Total Target Analyte List Metals

New Mexico Environment Department DOE Oversight Bureau

Sandia National Laboratories/New Mexico: Chemical Waste Landfill

July 2018

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	CWL PCCP Limits (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
CWL-MW10 23-Jul-18	Aluminum	0.064	NE	NE	0.1	0.01	J	SW846:6020
	Antimony	0.00023	0.006	NE	0.001	0.00012	J	SW846:6020
	Arsenic	0.00039	0.01	NE	0.002	0.00039	U	SW846:6020
	Barium	0.7	2	NE	0.005	0.00056		SW846:6020
	Beryllium	0.000054	0.004	NE	0.0005	0.000054	U	SW846:6020
	Cadmium	0.000083	0.005	NE	0.002	0.000083	U	SW846:6020
	Calcium	96	NE	NE	1	0.085		SW846:6020
	Chromium	0.0052	0.10	0.050	0.01	0.00046	J	SW846:6020
	Cobalt	0.00011	NE	NE	0.005	0.00011	J	SW846:6020
	Copper	0.00032	NE	NE	0.02	0.00032	U	SW846:6020
	Iron	0.82	NE	NE	0.1	0.0098		SW846:6020
	Lead	0.000079	NE	NE	0.002	0.000079	U	SW846:6020
	Magnesium	26	NE	NE	0.1	0.016		SW846:6020
	Manganese	0.7	NE	NE	0.005	0.00036		SW846:6020
	Mercury	0.00006	0.002	NE	0.0001	0.00006	U	SW846:7470A
	Nickel	0.0017	NE	0.028	0.02	0.00092	J	SW846:6020
	Potassium	7.3	NE	NE	1	0.039		SW846:6020
	Selenium	0.00065	0.05	NE	0.01	0.00065	U	SW846:6020
	Silver	0.000029	NE	NE	0.0005	0.000029	U	SW846:6020
	Sodium	71	NE	NE	1	0.022		SW846:6020
Thallium	0.00001	0.002	NE	0.0001	0.0000041	J	SW846:6020	
Vanadium	0.00012	NE	NE	0.005	0.00012	U	SW846:6020	
Zinc	0.054	NE	NE	0.1	0.0014	J	SW846:6020	

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Table-1

Groundwater Quality Monitoring Results: Total Target Analyte List Metals

New Mexico Environment Department DOE Oversight Bureau

Sandia National Laboratories/New Mexico: Chemical Waste Landfill

July 2018

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	CWL PCCP Limits (mg/L)	Laboratory Detection Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
CWL-MW11 19-Jul-18	Aluminum	0.091	NE	NE	0.1	0.01	J	SW846:6020
	Antimony	0.00012	0.006	NE	0.001	0.00012	U	SW846:6020
	Arsenic	0.00053	0.01	NE	0.002	0.00039	J	SW846:6020
	Barium	0.065	2	NE	0.005	0.00056		SW846:6020
	Beryllium	0.000054	0.004	NE	0.0005	0.000054	U	SW846:6020
	Cadmium	0.000083	0.005	NE	0.002	0.000083	U	SW846:6020
	Calcium	100	NE	NE	1	0.085		SW846:6020
	Chromium	0.0084	0.10	0.050	0.01	0.00046	J	SW846:6020
	Cobalt	0.00011	NE	NE	0.005	0.00011	J	SW846:6020
	Copper	0.00032	NE	NE	0.02	0.00032	U	SW846:6020
	Iron	0.17	NE	NE	0.1	0.0098		SW846:6020
	Lead	0.000079	NE	NE	0.002	0.000079	U	SW846:6020
	Magnesium	27	NE	NE	0.1	0.016		SW846:6020
	Manganese	0.037	NE	NE	0.005	0.00036		SW846:6020
	Mercury	0.00006	0.002	NE	0.0001	0.00006	U	SW846:7470A
	Nickel	0.002	NE	0.028	0.02	0.00092	J	SW846:6020
	Potassium	8.6	NE	NE	1	0.039		SW846:6020
	Selenium	0.0017	0.05	NE	0.01	0.00065	J	SW846:6020
	Silver	0.000029	NE	NE	0.0005	0.000029	U	SW846:6020
	Sodium	75	NE	NE	1	0.022		SW846:6020
Thallium	0.0000041	0.002	NE	0.0001	0.0000041	U	SW846:6020	
Vanadium	0.002	NE	NE	0.005	0.00012	J	SW846:6020	
Zinc	0.0014	NE	NE	0.1	0.0014	U	SW846:6020	

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U = the analyte was analyzed for but not detected

Table-2

Groundwater Quality Monitoring Results: Detected Volatile Organic Compounds

New Mexico Environment Department DOE Oversight Bureau

Sandia National Laboratories/New Mexico: Chemical Waste Landfill

July 2018

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	EPA MCL (µg/L)	CWL PCCP Limit (µg/L)	Laboratory Detection Limit (µg/L)	MDL (µg/L)	Laboratory Qualifier	Analytical Method
CWL-MW10 23-Jul-18	Trichloroethene	0.68	5	5	1	0.5	J	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).

Table-3

Groundwater Quality Monitoring Results: Method Detection Limits for Volatile Organic Compounds by Method SW846:8260B

New Mexico Environment Department DOE Oversight Bureau

Sandia National Laboratories/New Mexico: Chemical Waste Landfill

July 2018

Analyte	MDL (µg/L)
Acetone	3
Benzene	0.3
Bromobenzene	0.3
Bromochloromethane	0.3
Bromodichloromethane	0.3
Bromoform	0.3
Bromomethane	0.33
Butanone[2-]	3
Butylbenzene[n-]	0.3
Butylbenzene[sec-]	0.3
Butylbenzene[tert-]	0.3
Carbon Disulfide	0.3
Carbon Tetrachloride	0.15
Chlorobenzene	0.3
Chlorodibromomethane	0.3
Chloroethane	0.3
Chloroform	0.3
Chlorohexane[1-]	0.3
Chloromethane	0.3
Chlorotoluene[2-]	0.3
Chlorotoluene[4-]	0.3
Dibromo-3-Chloropropane[1,2-]	0.6
Dibromoethane[1,2-]	0.3
Dibromomethane	0.3
Dichlorobenzene[1,2-]	0.3
Dichlorobenzene[1,3-]	0.3
Dichlorobenzene[1,4-]	0.3
Dichlorodifluoromethane	0.3
Dichloroethane[1,1-]	0.3
Dichloroethane[1,2-]	0.15
Dichloroethene[1,1-]	0.3
Dichloroethene[cis-1,2-]	0.3
Dichloroethene[trans-1,2-]	0.3
Dichloropropane[1,2-]	0.3
Dichloropropane[1,3-]	0.15

Analyte	MDL (µg/L)
Dichloropropane[2,2-]	0.3
Dichloropropene[1,1-]	0.3
Dichloropropene[cis-1,3-]	0.3
Dichloropropene[trans-1,3-]	0.3
Ethylbenzene	0.3
Hexachlorobutadiene	0.3
Hexanone[2-]	3
Iodomethane	0.3
Isopropylbenzene	0.3
Isopropyltoluene[4-]	0.3
Methyl tert-Butyl Ether	0.3
Methyl-2-pentanone[4-]	3
Methylene Chloride	0.34
Naphthalene	0.3
Propylbenzene[1-]	0.3
Styrene	0.3
Tetrachloroethane[1,1,1,2-]	0.3
Tetrachloroethane[1,1,2,2-]	0.3
Tetrachloroethene	0.3
Toluene	0.3
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	0.5
Trichlorofluoromethane	0.3
Trichloropropane[1,2,3-]	0.3
Trimethylbenzene[1,2,4-]	0.3
Trimethylbenzene[1,3,5-]	0.3
Vinyl acetate	0.73
Vinyl Chloride	0.15
Xylene[1,2-]	0.3
Xylene[1,3-]+Xylene[1,4-]	0.3