

**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 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**

**1/22/2018**

---

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 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 2017. The Bureau collected groundwater samples from Chemical Waste Landfill (CWL) groundwater monitoring wells CWL-BW5, CWL-MW10 and CWL-MW11 (plus duplicate). 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), Permit Attachment 2, Groundwater Sampling and Analysis Plan (NMED October 2009). Samples were analyzed for total metals (chromium and nickel only) and volatile organic compounds (VOCs). The Bureau used ALS Environmental Laboratory located in Fort Collins, Colorado to analyze and report data results from samples collected at CWL. ALS Environmental is 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 at the CWL listed in the PCCP.

## **Data Assessment**

All groundwater samples were collected and analyzed in accordance with U.S. EPA protocols. The Bureau's 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, and to the Groundwater Concentration Limits for Hazardous Constituents of Concern (COC) in Table 1-2 of the CWL Post-Closure Care Permit, Permit Attachment 1, Post-Closure Plan for the CWL (NMED October 2009).

## **Results**

Analytical results for chromium and nickel are presented in Table-1. Chromium and nickel were not detected above the laboratory method detection limit (MDL) in any of the groundwater samples.

Volatile organic compounds detected at concentrations above the MDLs are presented in Table-2. Trichloroethene (TCE) was detected above the MDL at monitoring well CWL-MW10 at a concentration of 0.66 micrograms per liter ( $\mu\text{g/L}$ ). 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  $\mu\text{g/L}$ . No other VOCs were detected. Table-3 summarizes laboratory MDLs for the remaining VOCs analyzed from the samples collected at CWL monitoring wells.

## **Conclusion**

Groundwater samples were collected from three (3) monitoring wells during this semi-annual sampling event at the CWL. Samples collected by the Bureau and analyzed by ALS Environmental reported concentrations of metals and VOCs below established EPA MCLs and SNL/NM COC concentration limits listed in the PCCP. Groundwater results from CWL are comparable to historical results.

The DOE-OB will continue to monitor groundwater quality at the CWL semi-annually 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.

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

This page intentionally left blank.

Table-1

Groundwater Quality Results: Chromium and Nickel (EPA Method SW846-6020)

SNL/NM Chemical Waste Landfill Groundwater Monitoring

New Mexico Environment Department DOE Oversight Bureau

July 2017

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
<b>CWL-BW5</b> 18-Jul-17	Chromium	0.003	0.10	0.050	0.01	0.003	U	SW-846:6020
	Nickel	0.011	NE	0.028	0.02	0.011	U	SW-846:6020
<b>CWL-MW10</b> 24-Jul-17	Chromium	0.003	0.10	0.050	0.01	0.003	U	SW-846:6020
	Nickel	0.011	NE	0.028	0.02	0.011	U	SW-846:6020
<b>CWL-MW11</b> 20-Jul-17	Chromium	0.003	0.10	0.050	0.01	0.003	U	SW-846:6020
	Nickel	0.011	NE	0.028	0.02	0.011	U	SW-846:6020
<b>CWL-MW11</b> 20-Jul-17 DUP	Chromium	0.003	0.10	0.050	0.01	0.003	U	SW-846:6020
	Nickel	0.011	NE	0.028	0.02	0.011	U	SW-846:6020

NE = Not Established

U = the analyte was analyzed for but not detected

Table-2

Groundwater Quality Results: Detected Volatile Organic Compounds (EPA Method SW846-8260B)

SNL/NM Chemical Waste Landfill Groundwater Monitoring

New Mexico Environment Department DOE Oversight Bureau

July 2017

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	EPA MCL (µg/L)	CWL PCCP Limit (µg/L)	Laboratory Detection Limit (µg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
CWL-MW10 24-Jul-17	Trichloroethene	0.66	5	5	1	0.31	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).

Table-3

Groundwater Quality Results: Method Detection Limits for VOCs (EPA Method SW846-8260B)

SNL/NM Chemical Waste Landfill Groundwater Monitoring

New Mexico Environment Department DOE Oversight Bureau

July 2017

Analyte	MDL (mg/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 (mg/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