DOE Oversight Bureau, New Mexico Environment Department

Groundwater Monitoring at Sandia National Laboratories/New Mexico Tijeras Arroyo Groundwater

Conducted by the New Mexico Environment Department DOE Oversight Bureau for FFY 2016 Q-2

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The purpose of this communication is to transmit groundwater quality data collected by the New Mexico Environment Department DOE Oversight Bureau from Tijeras Arroyo Groundwater monitoring wells during second quarter FFY 2016.

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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 March 2016. The Bureau collected groundwater samples from Tijeras Arroyo Groundwater (TAG) Area of Concern (AOC) monitoring wells TA2-W-19, TA2-W-26, TA2-W-28, TJA-2, TJA-3 (plus duplicate), TJA-4 and TJA-7. TAG monitoring well WYO-4 purged dry and no samples were collected during this quarterly sampling event. Split samples were collected using standard Sandia National Laboratories/New Mexico (SNL/NM) sampling procedures and equipment. The samples were submitted to an independent analytical laboratory for analysis of nitrate-nitrite as nitrogen and volatile organic compounds (VOCs). Nitrate levels exceeded the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) or drinking water standard of 10 mg/L in samples collected from TAG monitoring wells TA2-W-19, TA2-W-28, TJA-2, TJA-4 and TJA-7.

Data Assessment

All groundwater samples were collected and analyzed in accordance with U.S. Environmental Protection Agency (EPA) 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 nitrate-nitrite as nitrogen are presented in Table-1. Nitrate-nitrite was detected in all TAG samples. Nitrate concentrations exceeded the EPA MCL of 10 mg/L at monitoring wells TA2-W-19 (11 mg/L), TA2-W-28 (22 mg/L), TJA-2 (11 mg/L), TJA-4 (29 mg/L) and TJA-7 (22 mg/L).

Volatile organic compounds detected at concentrations above the method detection limits (MDLs) are presented in Table-2. VOCs detected at low concentrations include: dichloroethane[1,1-], dichloroethene[cis-1,2-], tetrachloroethene and trichloroethene (TCE). Concentrations of TCE ranged from 1.2 μg/L at monitoring well TA2-W-26 to 4.2 μg/L at TJA-2. No VOCs were detected above their associated EPA drinking water standards. Table-3 summarizes the laboratory MDLs for the remaining VOCs analyzed from the samples collected at TAG monitoring wells.

Conclusion

The DOE-OB collected split groundwater samples from a total of seven (7) TAG AOC monitoring wells during FFY 2016 Q-2. No parameters were detected above EPA drinking water standards, except for nitrate at monitoring wells TA2-

W-19, TA2-W-28, TJA-2, TJA4 and TJA-7. Nitrate has been identified as a contaminate of concern from TAG AOC and the concentrations detected during FFY16 Q-2 compare well to historical values.

The DOE-OB will continue to collect split samples with SNL/NM from TAG groundwater monitoring wells and continue to independently monitor TAG wells for nitrates and other contaminates of concern. The Bureau will also continue to provide data results to DOE for review.

Table-1 NMED DOE Oversight Bureau FFY 2016 Q-2 Tijeras Arroyo Groundwater Quality Results: Nitrate-Nitrite as Nitrogen

Monitoring Well/ Sample Date	Analyte	Result (mg/L)	EPA MCL (mg/L)	Quantitation Limit (mg/L)	MDL (mg/L)	Laboratory Qualifier	Analytical Method
TA2-W-19 15-Mar-16	Nitrate-Nitrite as Nitrogen	**11**	10	0.1	0.03		EPA:353.2
TA2-W-26 14-Mar-16	Nitrate-Nitrite as Nitrogen	5.7	10	0.05	0.015		EPA:353.2
TA2-W-28 17-Mar-16	Nitrate-Nitrite as Nitrogen	**22**	10	0.5	0.15		EPA:353.2
TJA-2 16-Mar-16	Nitrate-Nitrite as Nitrogen	**11**	10	0.1	0.03		EPA:353.2
TJA-3 7-Mar-16	Nitrate-Nitrite as Nitrogen	2.6	10	0.1	0.03		EPA:353.2
TJA-3 7-Mar-16 (Duplicate)	Nitrate-Nitrite as Nitrogen	2.6	10	0.1	0.03		EPA:353.2
TJA-4 22-Mar-16	Nitrate-Nitrite as Nitrogen	**29**	10	0.5	0.15		EPA:353.2
TJA-7 23-Mar-16	Nitrate-Nitrite as Nitrogen	**22**	10	0.5	0.15		EPA:353.2

Table-2 NMED DOE Oversight Bureau FFY 2016 Q-2 Tijeras Arroyo Groundwater Quality Results: Detected Volatile Organic Compounds

Monitoring Well/ Sample Date	Analyte	Result (µg/L)	EPA MCL (µg/L)	Quantitation Limit (µg/L)	MDL (µg/L)	Laboratory Qualifier	Analytical Method
TA2-W-19 15-Mar-16	Dichloroethane[1,1-]	0.34	NE	1	0.3	J	SW-846:8260B_25
	Dichloroethene[cis-1,2-]	0.38	70	1	0.3	J	SW-846:8260B_25
	Trichloroethene	2.5	5	1	0.3		SW-846:8260B_25
TA2-W-26 14-Mar-16	Dichloroethene[cis-1,2-]	0.47	70	1	0.3	J	SW-846:8260B_25
	Tetrachloroethene	0.9	5	1	0.2	J	SW-846:8260B_25
	Trichloroethene	1.2	5	1	0.3		SW-846:8260B_25
TJA-2 16-Mar-16	Dichloroethane[1,1-]	0.47	NE	1	0.3	J	SW-846:8260B_25
	Dichloroethene[cis-1,2-]	0.55	70	1	0.3	J	SW-846:8260B_25
	Trichloroethene	4.2	5	1	0.3		SW-846:8260B_25
TJA-7 23-Mar-16	Trichloroethene	1.6	5	1	0.3		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).

NE = Not Established

Table-3 NMED DOE Oversight Bureau FFY 2016 Q-2 Tijeras Arroyo Groundwater Quality Results: Method Detection Limits for Volatile Organic Compounds by Method SW-846:8260B_25

Analyte	MDL (µg/L)
Acetone	3
Benzene	0.3
Bromobenzene	0.3
Bromochloromethane	0.3
Bromodichloromethane	0.3
Bromoform	0.3
Bromomethane	0.3
Butanone[2-]	3
Butylbenzene[n-]	0.3
Butylbenzene[sec-]	0.3
Butylbenzene[tert-]	0.3
Carbon Disulfide	0.3
Carbon Tetrachloride	0.3
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-]	0.4
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-]	0.3
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-]	0.3
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

Analyte	MDL (µg/L)
Hexanone[2-]	3
Iodomethane	0.38
Isopropylbenzene	0.3
Isopropyltoluene[4-]	0.3
Methyl tert-Butyl Ether	0.3
Methyl-2-pentanone[4-]	3
Methylene Chloride	0.44
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	0.2
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	0.3
Trichlorofluoromethane	0.3
Trichloropropane[1,2,3-]	0.3
Trimethylbenzene[1,2,4-]	0.3
Trimethylbenzene[1,3,5-]	0.3
Vinyl acetate	0.3
Vinyl Chloride	0.3
Xylene[1,2-]	0.3
Xylene[1,3-]+Xylene[1,4-]	0.3

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