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DEPARTMENT OF ENERGY
Environmental Management Los Alamos Field Office (EM-LA)
Los Alamos, New Mexico 87544

FEB 26 2020

EMLA-2020-1281-02-001

Mr. Kevin Pierard
Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313



Subject: Monthly Notification of Groundwater Data Reviewed in February 2020

Dear Mr. Pierard:

This letter is the U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office (EM-LA) and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) written submission in accordance with Section XXVI.D of the 2016 Compliance Order on Consent (2016 Consent Order). Members of EM-LA and N3B met on February 13, 2020, to review groundwater data received in January 2019 in accordance with Section XXVI.C of the 2016 Consent Order. The enclosed report was prepared by comparing the data against groundwater notification criteria as defined in Section IX of the 2016 Consent Order. These criteria consider New Mexico Water Quality Control Commission (NMWQCC) groundwater standards, U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCLs), New Mexico Environment Department (NMED) screening levels for tap water, EPA regional screening levels for tap water, and NMED-approved background values for hydrogeological zones as set forth in the "Groundwater Background Investigation Report, Revision 5." For comparison with EPA tap water standards, the standard's carcinogenic risk value was adjusted to 1×10^{-5} , as specified in the Consent Order.

The enclosed report was prepared using the November 2019 EPA regional screening levels for tap water; the NMWQCC groundwater standards, published December 21, 2018; and the June 2019 Table A-1 of "Risk Assessment Guidance for Site Investigations and Remediation" for NMED tap water screening levels.

There are a significant number of analytes detected that meet the reporting criteria for detection of a contaminant that is an organic compound in a spring or screened interval of a well if that contaminant has not previously been detected in the spring or screened interval (criteria code C1). These include per- and polyfluoroalkyl substances (PFAS), pentaerythritol tetranitrate, benzoic acid, and 1,4-dioxane. This notification provides the initial baseline data for the new regulatory constituents, including PFAS; focused validation and assessment of these results are ongoing. For 1,4-dioxane, this is the first evaluation at these monitoring locations using the low method detection limit of 0.1 µg/L.

N3B is completing the update of its data management software and is completing a comprehensive groundwater data review in order to submit a report for those samples collected on or after

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October 1, 2019, that did not meet the reporting criteria using the data management software and procedures before the upgrade. We anticipate providing this data review to NMED by April 1, 2020.

1-Day Notification

One-day notification was not required because there were no cases of a contaminant detected in a well screen interval or spring at a concentration that exceeded a water quality standard for the first time. There were no instances of a contaminant detected at a concentration that exceeded the NMWQCC groundwater standard or federal MCL at locations where contaminants have not previously been detected above the respective standard as defined in the 2016 Consent Order (based on samples collected since June 14, 2007).

15-Day Notification

The required information for the constituents that meet the five reporting criteria requiring written notification within 15 days is provided in the accompanying report and tables.

If you have questions, please contact Steve Veenis at (505) 309-1362 (steve.veenis@em-la.doe.gov) or Hai Shen at (505) 257-7943 (hai.shen@em.doe.gov).

Sincerely,



Arturo Q. Duran
Compliance and Permitting Manager
Environmental Management
Los Alamos Field Office

Enclosure:

1. Two hard copies with electronic files – Summary of Groundwater Data Reviewed in February 2020 That Meet Notification Requirements (EM2020-0090)

CC (letter with CD/DVD enclosure[s]):

Harry Burgess, Los Alamos County, Los Alamos, NM (2 copies)

CC (letter and enclosure[s] emailed):

Laurie King, EPA Region 6, Dallas, TX

Raymond Martinez, San Ildefonso Pueblo, NM

Dino Chavarria, Santa Clara Pueblo, NM

David Gomez, Los Alamos County, Los Alamos, NM

Neelam Dhawan, NMED

Michelle Hunter, NMED

Steve Pullen, NMED
Andrew C. Romero, NMED
Melanie Sandoval, NMED
Steve Yanicak, NMED-DOE-OB
Jocelyn Buckley, LANL
Leslie Dale, LANL
Brian Iacona, LANL
William Mairson, LANL
Jacob Meadows, LANL
Enrique Torres, LANL
William Alexander, N3B
Emily Day, N3B
Lori Huntoon, N3B
Danny Katzman, N3B
Joseph Legare, N3B
Dana Lindsay, N3B
Frazer Lockhart, N3B
Elizabeth Lowes, N3B
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SUMMARY OF GROUNDWATER DATA REVIEWED IN FEBRUARY 2020 THAT MEET NOTIFICATION REQUIREMENTS

INTRODUCTION

This report provides information to the New Mexico Environment Department (NMED) concerning recent groundwater monitoring data obtained by Newport News Nuclear BWXT-Los Alamos, LLC (N3B) under the annual “Interim Facility-Wide Groundwater Monitoring Plan” for the 2020 monitoring year and contains results for contaminants and other chemical constituents that meet the five screening criteria described in Section XXVI of the 2016 Compliance Order on Consent modified February 2017 (2016 Consent Order). The report covers groundwater samples collected from wells or springs (listed in the accompanying tables) that provide surveillance of the hydrogeological zones at Los Alamos National Laboratory as indicated in the tables.

The report includes two tables. Table 1, NMED 01-20 Groundwater Report, presents results since May 17, 2005, that met the five reporting criteria as specified in the 2016 Consent Order. Table 2, NMED 01-20 Groundwater Report Addendum, presents results that exceed the 95th percentile of those results in the data set defined in the “Groundwater Background Investigation Report, Revision 5.” Only the contaminants and other chemical constituents that lack a calculated groundwater background value (i.e., the frequency of detections was too low to calculate a background value at the 95% upper tolerance level) are listed in this table. Table 2 is a voluntary submission by N3B to NMED to identify the potential risk resulting from contaminants and other chemical constituents that are without defined background values.

These tables include the following:

- Comments on results that appear to be exceptional based on consideration of monitoring data acquired from previous analyses (using statistics described below)
- Supplemental information summarizing monitoring results obtained from previous analyses
- Sampling date, name of the well or spring, location of the well or spring, depth of the screened interval, groundwater zone sampled, analytical result, detection limit, values for regulatory standards or screening levels, and analytical and secondary validation qualifiers. Additional information describing the locations and analytical data is also included. All data have been through secondary validation.

This report was prepared by comparing the data against groundwater notification criteria as defined in Section IX of the 2016 Consent Order. These criteria consider New Mexico Water Quality Control Commission (NMWQCC) groundwater standards, U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCLs), NMED screening levels for tap water, EPA regional screening levels for tap water, and NMED-approved background values for hydrogeological zones as set forth in the “Groundwater Background Investigation Report, Revision 5.” For comparison with EPA tap water standards, the standard’s carcinogenic risk value was adjusted to 1×10^{-5} , as specified in the 2016 Consent Order. This report was prepared using the November 2019 EPA regional screening levels for tap water; the NMWQCC groundwater standards published December 21, 2018; and the NMED tap water screening levels specified in the June 2019 Table A-1 of “Risk Assessment Guidance for Site Investigations and Remediation.”

Background values applied in Table 1 notification criteria C2 and C4 are the background values for hydrogeological zones as set forth in the NMED-approved “Groundwater Background Investigation Report, Revision 5.”

Screening values applied in Table 2 criteria XC2scr and XC4scr are the 95th percentile of the data set used to establish background as defined in the “Groundwater Background Investigation Report, Revision 5.”

DESCRIPTION OF TABLES

15-Day Notification Requirement

Table 1 is divided into separate categories that correspond to the five screening criteria in Section XXVI of the 2016 Consent Order. In several cases, data met more than one of the notification criteria and therefore appear in the table multiple times.

The criteria codes (the “C” stands for criterion) and their definitions are as follows:

- C1. Detection of a contaminant that is an organic compound in a spring or screened interval of a well if that contaminant has not previously been detected in the spring or screened interval.
- C2. Detection of a contaminant that is a metal or other inorganic compound at a concentration above the background level in a spring or screened interval of a well if that contaminant has not previously exceeded the background level in the spring or screened interval.
- C3. Detection of a contaminant in a spring or screened interval of a well at a concentration that (1) exceeds the lower of either one-half the NMWQCC water quality standard or one-half the federal MCL, or, if there is no such standard for the contaminant, (2) exceeds one-half the tap water screening levels in Table A-1 of NMED's “Risk Assessment Guidance for Site Investigations and Remediation” (June 2019), or, if there is no NMED tap water screening level available for a contaminant, (3) exceeds one-half the EPA regional human health medium-specific screening level for tap water, if that contaminant has not previously exceeded one-half such standard or screening level in the spring or screened interval.
- C4. Detection of a contaminant that is a metal or other inorganic compound in a spring or screened interval of a well at a concentration that exceeds 2 times the background level for the third consecutive sampling of the spring or screened interval.
- C5. Detection of a contaminant in a spring or screened interval of a well at a concentration that exceeds either one-half the NMWQCC water quality standard or one-half the federal MCL and which has increased for the third consecutive sampling of that spring or screened interval.

Table 2 is divided into two categories that correspond to two screening criteria. They mirror criteria C2 and C4 in Table 1, respectively.

The two criteria are as follows:

- XC2scr Detection of a contaminant that is a metal or other inorganic compound at a concentration above the 95th percentile in a spring or screened interval of a well if that contaminant has not previously exceeded the 95th percentile of the data set used to establish background in the spring or screened interval as defined in the “Groundwater Background Investigation Report, Revision 5.”
- XC4scr Detection of a contaminant that is a metal or other inorganic compound in a spring or screened interval of a well at a concentration that for the third consecutive sampling exceeds 2 times the 95th percentile of the data set used to establish background as defined in the “Groundwater Background Investigation Report, Revision 5.”

Columns 2 through 8 in both tables provide summary statistics for metals or organic/inorganic compounds by field preparation code (e.g., filtered aluminum) for samples collected since January 1, 2000, including the currently reported data. The statistics include the date of the first sampling event; the number of sampling events and samples analyzed; the number of detections; and the minimum, maximum, and median concentration for detections. This information indicates whether the new result is consistent with the range of earlier data.

The subsequent columns contain location and sampling information as follows:

Canyon—canyon where monitoring location is found

Zone—hydrogeological zone from which the groundwater sample was collected (e.g., alluvial spring)

Location—monitoring location name

Screen Depth—depth of top of well screen in feet (0 for springs, –1 if unknown)

Start Date—date the sample was collected

Fld QC Type Code—identifies regular samples (REG) or field duplicates (FD)

Fld Prep Code—identifies whether samples are filtered (F) or unfiltered (UF)

Lab Sample Type Code—indicates whether result is a primary sample (INIT) or reanalysis (RE)

Anyl Suite Code—analytical suite (such as volatile organic compounds) for analyzed compound

Analyte Desc—name of analyte

Analyte—chemical symbol for analyte or CAS (Chemical Abstracts Service) number for organic compounds

Std Result—analytical result in standard measurement units

Result/Median—ratio of the Std Result to the median of all detections since 2000

LVL Type/Risk Code—type of regulatory standard, screening level, or background value (indicating groundwater zone) used for comparison

Screen Level—value of the LVL Type/Risk Code

Exceedance Ratio—ratio of Std Result to LVL Type/Risk Code. In earlier versions of this report, the ratio was divided by the basis for comparison in the criterion, but that is no longer the case. For example, for a criterion (such as C3) that compares the value with one-half the standard, a value equal to a standard previously had an exceedance ratio of 2. The current report shows this ratio as 1.

Std MDL—method detection limit in standard measurement units

Std UOM—standard units of measurement

Dilution Factor—amount by which the sample was diluted to measure the concentration

Lab Qualifier—analytical laboratory qualifier indicating analytical quality of the sample data

Validation Qualifier—the qualifier that indicates the effects of all processes associated with the sample (i.e., sample collection, additional quality control samples such as field duplicates, etc.) on the quality of the sample data

Validation Reason Code—an explanation of the reason for validation of the qualifiers

Anyl Meth Code—analytical method number

Lab Code—analytical laboratory name

Comment—N3B comment regarding the analytical result

The tables may include the following acronyms, abbreviations, and analytical laboratory codes and qualifiers.

ACRONYMS AND ABBREVIATIONS

DNX—hexahydro-1,3-dinitro-5-nitro-1,3,5-triazine

EPA MCL—U.S. Environmental Protection Agency maximum contaminant level

GENINORG—General inorganic

HMX—octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine

HEXP—high explosive

HRMS—high-resolution mass spectrometry

LANL Int BG LV—Los Alamos National Laboratory intermediate background level

LANL Reg BG LV—Los Alamos National Laboratory regional background level

LCMS/MS—liquid chromatography mass spectrometry/mass spectrometry

MDL—method detection limit

MNX—hexahydro-1-nitroso-3,5-dinitro-1,3,5-triazine

NM GW STD—New Mexico Water Quality Control Commission groundwater standard

NMED A1 TAP SCRNLVL—New Mexico Environment Department screening level for tap water

NTU—nephelometric turbidity unit

PETN—pentaerythritol tetranitrate

PFAS—per- and polyfluoroalkyl substances

PQL—practical quantitation limit

RDX—Royal Demolition Explosive (hexahydro-1,3,5-trinitro-1,3,5-triazine)

SVOC—semivolatile organic compound

TDS—total dissolved solids

TNX—2,4,6-trinitroxylyene

UAL—upper acceptance limit

UOM—units of measurement

VOC—Volatile organic compound

ANALYTICAL LABORATORY CODES AND QUALIFIERS

* (lab qualifier) - (inorganic)—Duplicate analysis (relative percent difference) is not within control limits.

BJ (lab qualifier)—Analyte is present in the blank, and the associated numerical value is an estimated quantity.

F—filtered

FD—field duplicate

GELC—General Engineering Laboratories, Inc., Charleston, SC

SwRI—Southwest Research Institute

GENINORG—general inorganic

H (lab qualifier)—The required extraction or analysis holding time for this result was exceeded.

HJ (lab qualifier)—The required extraction or analysis holding time for this result was exceeded. The associated numerical value is an estimated quantity.

I4a (validation reason code)—The affected analyte is considered estimated and biased high because this analyte was identified in the method blank but was greater than 5 times the concentration of the affected analyte in the sample.

I6b ((validation reason code)—The associated matrix spike recovery was above the UAL. Follow the external laboratory limits located within the associated data package.

I9b (validation reason code)—The affected analytes are regarded as rejected because the analytical holding time was exceeded.

INIT—primary sample

J (lab qualifier)—The associated numerical value is an estimated quantity.

J (validation qualifier)—The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual.

J- (validation qualifier)—The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential negative bias.

J+ (validation qualifier)—The analyte is classified as detected, but the reported concentration value is expected to be more uncertain than usual with a potential positive bias.

J_LAB (validation reason code)—The analytical laboratory qualified the detected result as estimated (J) because the result was less than the PQL but greater than the MDL.

N (lab qualifier)—Spiked sample recovery is not within control limits.

NQ (validation qualifier)—No validation qualifier flag is associated with this result, and the analyte is classified as detected.

NQ (validation reason code)—The analytical laboratory did not qualify the analyte as not detected and/or with any other standard qualifier. The analyte is detected in the sample.

PE12e (validation reason code)—The MS/MSD percent recovery was >10% but <75%.

RE—reanalysis

REG—regular sample

UF—unfiltered

V9b (validation reason code)—The preserved sample was analyzed outside the 14-day holding time or the unpreserved sample was analyzed outside the 7-day holding time.

Table 1: NMED 01-20 Groundwater Report

Criteria Code	Visits	Samples	First Event	Min Detect	Max Detect	Median Detect	Num Detect	Canyon	Zone	Location	Screen Depth	Start Date	Fid QC Type Code	Fid Prep Code	Lab Sample Type Code	AnyI Suite Code	Analyte Desc	Analyte	Std Result	Result/Median	LVL Type/Risk Code	Screen Level	Exceedance Ratio	Std MDL	Std UOM	Dilution Factor	Lab Qualifier	Validation Qualifier	Validation Reason Code	AnyI Meth Code	Lab Code	Comment
C1	1	1	10/31/2019	0.99	0.99	1.0	1	Pajarito Canyon	Alluvial	18-MW-18	12.5	10/31/2019	REG	UF	INIT	PFAS	Perfluorohexanesulfonic acid	355-46-4	0.99	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.58	ng/L	1.00	J	J	J_LAB	EPA:537M	GELC	First sampling for PFAS
C1	1	1	10/31/2019	2.88	2.88	2.880	1	Pajarito Canyon	Alluvial	18-MW-18	12.5	10/31/2019	REG	UF	INIT	PFAS	Perfluorooctanesulfonic acid	1763-23-1	2.88	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.706	ng/L	1.00		NQ	NQ	EPA:537M	GELC	First sampling for PFAS
C1	1	1	10/31/2019	1.14	1.14	1.14	1	Pajarito Canyon	Alluvial	18-MW-18	12.5	10/31/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	1.14	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.706	ng/L	1	J	J	J_LAB	EPA:537M	GELC	First sampling for PFAS
C1	1	1	12/03/2019	0.61	0.61	0.6	1	Water Canyon	Intermediate Perched	16-26644	129.0	12/03/2019	REG	UF	INIT	PFAS	Perfluorohexanesulfonic acid	355-46-4	0.61	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.59	ng/L	1.00	J	J	J_LAB	EPA:537M	GELC	First sampling for PFAS
C1	1	1	11/01/2019	1.15	1.15	1.2	1	Water Canyon	Intermediate Perched	CdV-16-1(i)	624.0	11/01/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	1.15	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.631	ng/L	1.0	J	J	J_LAB	EPA:537M	GELC	First sampling for PFAS
C1	1	1	12/13/2019	10.80	10.80	10.80	1	Water Canyon	Intermediate Perched	CdV-16-2(i)r	850.0	12/13/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	10.80	1.0	NMED A1 TAP SCRNLVL	70.0	0.2	0.73	ng/L	1.00		NQ	NQ	EPA:537M	GELC	First sampling for PFAS
C1	1	1	12/13/2019	11.70	11.70	11.7	1	Water Canyon	Intermediate Perched	CDV-16-4ip S1	815.6	12/13/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	11.70	1.0	NMED A1 TAP SCRNLVL	70.0	0.2	0.72	ng/L	1.00		NQ	NQ	EPA:537M	GELC	First sampling for PFAS
C1	1	2	12/03/2019	2.17	2.41	2.290	2	Water Canyon	Intermediate Perched	CDV-9-1(i) S1	937.4	12/03/2019	FD	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	2.41	1.1	NMED A1 TAP SCRNLVL	70.0	0.0	0.716	ng/L	1.00		NQ	NQ	EPA:537M	GELC	First sampling for PFAS
C1	1	2	12/03/2019	2.17	2.41	2.29	2	Water Canyon	Intermediate Perched	CDV-9-1(i) S1	937.4	12/03/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	2.17	0.9	NMED A1 TAP SCRNLVL	70.0	0.0	0.703	ng/L	1		NQ	NQ	EPA:537M	GELC	First sampling for PFAS
C1	1	1	10/30/2019	1.37	1.37	1.4	1	Pajarito Canyon	Intermediate Perched	R-40 S1	751.6	10/30/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	1.37	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.77	ng/L	1.00	J	J	J_LAB	EPA:537M	GELC	First sampling for PFAS

Table 1: NMED 01-20 Groundwater Report

Criteria Code	Visits	Samples	First Event	Min Detect	Max Detect	Median Detect	Num Detect	Canyon	Zone	Location	Screen Depth	Start Date	Fld QC Type Code	Fld Prep Code	Lab Sample Type Code	Anyl Suite Code	Analyte Desc	Analyte	Std Result	Result/Median	LVL Type/Risk Code	Screen Level	Exceedance Ratio	Std MDL	Std UOM	Dilution Factor	Lab Qualifier	Validation Qualifier	Validation Reason Code	Anyl Meth Code	Lab Code	Comment
C1	9	9	06/18/2009	1.76	1.76	1.760	1	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	UF	INIT	VOC	Acetone	67-64-1	1.76	1.0	NMED A1 TAP SCRNLVL	14100.0	0.0	1.500	µg/L	1.0	J	J	J_LAB	SW-846:8260B	GELC	
C1	8	8	08/18/2009	16.50	16.50	16.5	1	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	UF	INIT	SVOC	Benzoic Acid	65-85-0	16.50	1.0	EPA TAP SCRNLVL	75000.0	0.0	6.380	µg/L	1.00	J	J	J_LAB	SW-846:8270D	GELC	
C1	1	1	11/05/2019	0.80	0.80	1	1	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	0.80	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.63	ng/L	1.00	J	J	J_LAB	EPA:537M	GELC	First sampling for PFAS
C1	18	20	07/13/2011	2.12	2.12	2.12	1	Pajarito Canyon	Regional Deep	R-57 S2	971.5	10/18/2019	REG	UF	INIT	VOC	Acetone	67-64-1	2.12	1.0	NMED A1 TAP SCRNLVL	14100.0	0.0	1.50	µg/L	1.00	J	J	J_LAB	SW-846:8260B	GELC	
C1	10	11	07/13/2011	13.00	13.00	13.0	1	Pajarito Canyon	Regional Deep	R-57 S2	971.5	10/18/2019	REG	UF	INIT	SVOC	Benzoic Acid	65-85-0	13.00	1.0	EPA TAP SCRNLVL	75000.0	0.0	6.35	µg/L	1.0	J	J	J_LAB	SW-846:8270D	GELC	
C1	10	15	07/14/2009	0.297	0.297	0.297	1	Mortandad Canyon	Regional Top	R-44 S1	895.0	11/20/2019	REG	UF	INIT	Low-level 1,4-dioxane	Dioxane[1,4-]	123-91-1	0.30	1.0	NMED A1 TAP SCRNLVL	4.6	0.1	0.100	µg/L	1.00	J	J	J_LAB	SW-846:8270E_SIM	GELC	First analysis using low-level method (MDL = 0.1 µg/L)
C1	4	5	05/13/2009	0.11	0.12	0.1	2	Mortandad Canyon	Regional Top	R-46	1340.0	11/21/2019	FD	UF	INIT	HEXP	PETN	78-11-5	0.11	1.0	EPA TAP SCRNLVL	190.0	0.0	0.10	µg/L	2.00	J	J	J_LAB	SW-846:8330B	GELC	First sampling for PETN since 2014
C1	4	5	05/13/2009	0.11	0.12	0.1	2	Mortandad Canyon	Regional Top	R-46	1340.0	11/21/2019	REG	UF	INIT	HEXP	PETN	78-11-5	0.12	1.0	EPA TAP SCRNLVL	190.0	0.0	0.102	µg/L	2.00	J	J	J_LAB	SW-846:8330B	GELC	First sampling for PETN since 2014
C1	13	18	05/20/2011	0.196	0.196	0.196	1	Mortandad Canyon	Regional Top	R-61 S1	1125.0	11/20/2019	REG	UF	INIT	Low-level 1,4-dioxane	Dioxane[1,4-]	123-91-1	0.20	1.0	NMED A1 TAP SCRNLVL	4.6	0.0	0.100	µg/L	1.00	J	J	J_LAB	SW-846:8270E_SIM	GELC	First analysis using low-level method (MDL=0.1 µg/L)
C1	1	1	11/05/2019	0.88	0.88	0.878	1	Sandia Canyon	Regional Top	R-67	1242.6	11/05/2019	REG	UF	INIT	PFAS	Perfluorooctanoic acid	335-67-1	0.88	1.0	NMED A1 TAP SCRNLVL	70.0	0.0	0.625	ng/L	1	J	J	J_LAB	EPA:537M	GELC	First sampling for PFAS
C2	20	24	07/13/2009	3.93	16.10	4.8	24	Mortandad Canyon	Intermediate Perched	R-37 S1	929.3	10/21/2019	REG	F	INIT	Metals	Vanadium	V	16.10	3.4	LANL Int BG LVL	9.3	1.7	3.30	µg/L	1.00	J	J	J_LAB	SW-846:6020B	GELC	

Table 1: NMED 01-20 Groundwater Report

Criteria Code	Visits	Samples	First Event	Min Detect	Max Detect	Median Detect	Num Detect	Canyon	Zone	Location	Screen Depth	Start Date	Fld QC Type Code	Fld Prep Code	Lab Sample Type Code	Anyl Suite Code	Analyte Desc	Analyte	Std Result	Result/Median	LVL Type/Risk Code	Screen Level	Exceedance Ratio	Std MDL	Std UOM	Dilution Factor	Lab Qualifier	Validation Qualifier	Validation Reason Code	Anyl Meth Code	Lab Code	Comment
C2	17	20	02/21/2010	2.07	9.03	3.13	11	Pajarito Canyon	Regional Deep	R-54 S2	915.0	10/21/2019	REG	F	INIT	Metals	Chromium	Cr	9.03	2.9	LANL Reg BG LVL	7.5	1.2	3.00	µg/L	1.0	J	J	J_LAB	SW-846:6020B	GELC	
C2	17	20	02/21/2010	0.57	3.58	0.75	8	Pajarito Canyon	Regional Deep	R-54 S2	915.0	10/21/2019	REG	F	INIT	Metals	Nickel	Ni	3.58	4.8	LANL Reg BG LVL	2.9	1.2	0.600	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C2	17	20	02/21/2010	104.00	183.00	123	20	Pajarito Canyon	Regional Deep	R-54 S2	915.0	10/21/2019	REG	F	INIT	Geninorg	Total Dissolved Solids	TDS	183.00	1.5	LANL Reg BG LVL	161.0	1.1	3.40	mg/L	1.00		NQ	NQ	EPA:160.1	GELC	
C2	17	20	02/21/2010	4.28	13.70	5.0	20	Pajarito Canyon	Regional Deep	R-54 S2	915.0	10/21/2019	REG	F	INIT	Metals	Vanadium	V	13.70	2.7	LANL Reg BG LVL	11.4	1.2	3.300	µg/L	1.00	J	J	J_LAB	SW-846:6020B	GELC	
C2	12	13	06/25/2010	126.00	284.00	140.00	13	Pajarito Canyon	Regional Deep	R-57 S2	971.5	10/18/2019	REG	F	INIT	Geninorg	Total Dissolved Solids	TDS	284.00	2.0	LANL Reg BG LVL	161.0	1.8	3.400	mg/L	1.00		NQ	NQ	EPA:160.1	GELC	
C2	12	13	06/25/2010	3.91	12.70	4.76	13	Pajarito Canyon	Regional Deep	R-57 S2	971.5	10/18/2019	REG	F	INIT	Metals	Vanadium	V	12.70	2.7	LANL Reg BG LVL	11.4	1.1	3.300	µg/L	1.00	J	J	J_LAB	SW-846:6020B	GELC	
C2	12	13	07/01/2010	3.86	13.60	4.7	13	Pajarito Canyon	Regional Top	R-57 S1	910.0	10/18/2019	REG	F	INIT	Metals	Vanadium	V	13.60	2.9	LANL Reg BG LVL	11.4	1.2	3.30	µg/L	1.00	J	J	J_LAB	SW-846:6020B	GELC	
C4	20	24	07/13/2009	21.20	26.20	24.65	24	Mortandad Canyon	Intermediate Perched	R-37 S1	929.3	10/21/2019	REG	F	INIT	Metals	Calcium	Ca	24.30	1.0	LANL Int BG LVL	10.7	2.3	0.050	mg/L	1.0		NQ	NQ	SW-846:6010C	GELC	
C4	20	24	07/13/2009	0.23	0.74	0.53	24	Mortandad Canyon	Intermediate Perched	R-37 S1	929.3	10/21/2019	REG	F	INIT	Geninorg	Fluoride	F(-1)	0.62	1.2	LANL Int BG LVL	0.2	2.6	0.033	mg/L	1.0		NQ	NQ	EPA:300.0	GELC	
C4	20	24	07/13/2009	73.10	89.40	84.8	24	Mortandad Canyon	Intermediate Perched	R-37 S1	929.3	10/21/2019	REG	F	INIT	Geninorg	Hardness	Hardness	84.10	1.0	LANL Int BG LVL	37.8	2.2	0.453	mg/L	1.00		NQ	NQ	SM:A2340B	GELC	
C4	56	61	08/30/2007	68.00	389.00	346.0	61	Sandia Canyon	Regional Deep	R-35a	1013.1	12/05/2019	REG	F	INIT	Metals	Barium	Ba	337.00	1.0	LANL Reg BG LVL	38.1	8.8	1.000	µg/L	1.00		NQ	NQ	SW-846:6010C	GELC	
C4	53	59	08/30/2007	5.97	7.31	6.46	59	Sandia Canyon	Regional Deep	R-35a	1013.1	10/16/2019	FD	F	RE	Geninorg	Chloride	Cl(-1)	6.74	1.0	LANL Reg BG LVL	2.7	2.5	0.067	mg/L	1.00	H	J-	I9b	EPA:300.0	GELC	
C4	53	59	08/30/2007	5.97	7.31	6.46	59	Sandia Canyon	Regional Deep	R-35a	1013.1	12/05/2019	REG	F	INIT	Geninorg	Chloride	Cl(-1)	6.37	1.0	LANL Reg BG LVL	2.7	2.4	0.067	mg/L	1.0		NQ	NQ	EPA:300.0	GELC	
C4	43	47	11/10/2008	3.37	7.39	4.66	47	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	F	INIT	Geninorg	Chloride	Cl(-1)	7.39	1.6	LANL Reg BG LVL	2.7	2.7	0.067	mg/L	1		J+	I6b	EPA:300.0	GELC	

Table 1: NMED 01-20 Groundwater Report

Criteria Code	Visits	Samples	First Event	Min Detect	Max Detect	Median Detect	Num Detect	Canyon	Zone	Location	Screen Depth	Start Date	Fld QC Type Code	Fld Prep Code	Lab Sample Type Code	Anyl Suite Code	Analyte Desc	Analyte	Std Result	Result/Median	LVL Type/Risk Code	Screen Level	Exceedance Ratio	Std MDL	Std UOM	Dilution Factor	Lab Qualifier	Validation Qualifier	Validation Reason Code	Anyl Meth Code	Lab Code	Comment
C4	43	52	11/10/2008	1.80	32.40	6.855	42	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	F	INIT	Metals	Chromium	Cr	32.10	4.7	LANL Reg BG LVL	7.5	4.3	3.000	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C4	43	46	11/10/2008	0.39	5.40	2.690	46	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	4.18	1.6	LANL Reg BG LVL	0.8	5.4	0.170	mg/L	10.00		NQ	NQ	EPA:353.2	GELC	
C4	43	47	11/10/2008	0.41	0.95	1	47	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	F	INIT	Geninorg	Perchlorate	CIO4	0.90	1.2	LANL Reg BG LVL	0.4	2.2	0.05	µg/L	1.00		NQ	NQ	SW-846:6850	GELC	
C4	43	47	11/10/2008	3.96	10.80	6.72	47	Sandia Canyon	Regional Deep	R-43 S2	969.1	11/05/2019	REG	F	INIT	Geninorg	Sulfate	SO4(-2)	10.80	1.6	LANL Reg BG LVL	4.6	2.4	0.133	mg/L	1.00		NQ	NQ	EPA:300.0	GELC	
C4	55	63	03/05/2009	6.10	47.40	20.35	62	Mortandad Canyon	Regional Deep	R-45 S2	974.9	12/06/2019	REG	F	INIT	Metals	Chromium	Cr	32.70	1.6	LANL Reg BG LVL	7.5	4.4	3.000	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C4	68	80	05/17/2005	2.27	7.43	5.38	80	Sandia Canyon	Regional Top	R-11	855.0	12/04/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	4.98	0.9	LANL Reg BG LVL	0.8	6.5	0.425	mg/L	25.00		NQ	NQ	EPA:353.2	GELC	
C4	57	59	02/17/2009	1.99	20.30	2.41	59	Mortandad Canyon	Regional Top	R-44 S1	895.0	12/10/2019	REG	F	INIT	Geninorg	Chloride	Cl(-1)	18.80	7.8	LANL Reg BG LVL	2.7	7.0	0.335	mg/L	5		NQ	NQ	EPA:300.0	GELC	
C4	57	59	02/17/2009	1.99	20.30	2.41	59	Mortandad Canyon	Regional Top	R-44 S1	895.0	11/20/2019	REG	F	INIT	Geninorg	Chloride	Cl(-1)	20.30	8.4	LANL Reg BG LVL	2.7	7.5	0.335	mg/L	5.00		NQ	NQ	EPA:300.0	GELC	
C4	57	59	02/17/2009	0.54	62.90	2.1	32	Mortandad Canyon	Regional Top	R-44 S1	895.0	12/10/2019	REG	F	INIT	Metals	Nickel	Ni	62.90	29.6	LANL Reg BG LVL	2.9	21.7	0.600	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C4	57	59	02/17/2009	0.54	42.80	2.1	32	Mortandad Canyon	Regional Top	R-44 S1	895.0	11/20/2019	REG	F	INIT	Metals	Nickel	Ni	42.80	20.1	LANL Reg BG LVL	2.9	14.8	0.600	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C4	57	59	02/17/2009	0.12	2.66	1.2	58	Mortandad Canyon	Regional Top	R-44 S1	895.0	12/10/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	2.42	2.1	LANL Reg BG LVL	0.8	3.1	0.17	mg/L	10.00		NQ	NQ	EPA:353.2	GELC	
C4	57	59	02/17/2009	0.12	2.66	1.17	58	Mortandad Canyon	Regional Top	R-44 S1	895.0	11/20/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	2.44	2.1	LANL Reg BG LVL	0.8	3.2	0.170	mg/L	10.00		NQ	NQ	EPA:353.2	GELC	
C4	57	59	02/17/2009	2.76	19.80	3.5	59	Mortandad Canyon	Regional Top	R-44 S1	895.0	12/10/2019	REG	F	INIT	Geninorg	Sulfate	SO4(-2)	18.50	5.3	LANL Reg BG LVL	4.6	4.0	0.665	mg/L	5.00		NQ	NQ	EPA:300.0	GELC	
C4	57	59	02/17/2009	2.76	19.80	3.47	59	Mortandad Canyon	Regional Top	R-44 S1	895.0	11/20/2019	REG	F	INIT	Geninorg	Sulfate	SO4(-2)	19.80	5.7	LANL Reg BG LVL	4.6	4.3	0.665	mg/L	5.0		NQ	NQ	EPA:300.0	GELC	

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Criteria Code	Visits	Samples	First Event	Min Detect	Max Detect	Median Detect	Num Detect	Canyon	Zone	Location	Screen Depth	Start Date	Fld QC Type Code	Fld Prep Code	Lab Sample Type Code	Anyl Suite Code	Analyte Desc	Analyte	Std Result	Result/Median	LVL Type/Risk Code	Screen Level	Exceedance Ratio	Std MDL	Std UOM	Dilution Factor	Lab Qualifier	Validation Qualifier	Validation Reason Code	Anyl Meth Code	Lab Code	Comment
C4	56	63	02/28/2009	8.40	50.70	33.6	63	Mortandad Canyon	Regional Top	R-45 S1	880.0	12/06/2019	REG	F	INIT	Metals	Chromium	Cr	30.60	0.9	LANL Reg BG LVL	7.5	4.1	3.0	µg/L	1		NQ	NQ	SW-846:6020B	GELC	
C4	56	59	02/28/2009	0.26	3.47	2.8	59	Mortandad Canyon	Regional Top	R-45 S1	880.0	12/06/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	2.47	0.9	LANL Reg BG LVL	0.8	3.2	0.17	mg/L	10.00		NQ	NQ	EPA:353.2	GELC	
C4	58	65	03/06/2010	4.68	19.60	9.2	65	Mortandad Canyon	Regional Top	R-50 S1	1077.0	12/02/2019	REG	F	INIT	Geninorg	Chloride	Cl(-1)	17.60	1.9	LANL Reg BG LVL	2.7	6.5	0.268	mg/L	4.00		NQ	NQ	EPA:300.0	GELC	
C4	58	67	03/06/2010	40.50	150.00	95.7	67	Mortandad Canyon	Regional Top	R-50 S1	1077.0	12/02/2019	REG	F	INIT	Metals	Chromium	Cr	45.80	0.5	LANL Reg BG LVL	7.5	6.1	15.00	µg/L	5.00	J	J	J_LAB	SW-846:6020B	GELC	
C4	58	65	03/06/2010	1.51	10.80	4.02	65	Mortandad Canyon	Regional Top	R-50 S1	1077.0	12/02/2019	REG	F	INIT	Metals	Nickel	Ni	10.80	2.7	LANL Reg BG LVL	2.9	3.7	3.00	µg/L	5.00		NQ	NQ	SW-846:6020B	GELC	
C4	58	66	03/06/2010	0.40	2.94	2.0	66	Mortandad Canyon	Regional Top	R-50 S1	1077.0	12/02/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	2.27	1.1	LANL Reg BG LVL	0.8	3.0	0.170	mg/L	10.0		NQ	NQ	EPA:353.2	GELC	
C4	58	65	03/06/2010	7.22	20.20	13.500	65	Mortandad Canyon	Regional Top	R-50 S1	1077.0	12/02/2019	REG	F	INIT	Geninorg	Sulfate	SO4(-2)	18.80	1.4	LANL Reg BG LVL	4.6	4.1	0.133	mg/L	1.00		NQ	NQ	EPA:300.0	GELC	
C4	41	47	05/20/2011	2.03	39.10	20.6	46	Mortandad Canyon	Regional Top	R-61 S1	1125.0	12/09/2019	FD	F	INIT	Metals	Chromium	Cr	28.70	1.4	LANL Reg BG LVL	7.5	3.8	3.000	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C4	41	47	05/20/2011	2.03	39.10	21	46	Mortandad Canyon	Regional Top	R-61 S1	1125.0	12/09/2019	REG	F	INIT	Metals	Chromium	Cr	28.50	1.4	LANL Reg BG LVL	7.5	3.8	3.00	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C4	41	47	05/20/2011	2.03	39.10	20.55	46	Mortandad Canyon	Regional Top	R-61 S1	1125.0	11/20/2019	REG	F	INIT	Metals	Chromium	Cr	33.10	1.6	LANL Reg BG LVL	7.5	4.4	3.000	µg/L	1.00		NQ	NQ	SW-846:6020B	GELC	
C4	41	47	05/20/2011	0.43	2.77	2.05	47	Mortandad Canyon	Regional Top	R-61 S1	1125.0	12/09/2019	FD	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	2.30	1.1	LANL Reg BG LVL	0.8	3.0	0.170	mg/L	10.0		NQ	NQ	EPA:353.2	GELC	
C4	41	47	05/20/2011	0.43	2.77	2.05	47	Mortandad Canyon	Regional Top	R-61 S1	1125.0	12/09/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	2.27	1.1	LANL Reg BG LVL	0.8	3.0	0.17	mg/L	10		NQ	NQ	EPA:353.2	GELC	
C4	41	47	05/20/2011	0.43	2.77	2.1	47	Mortandad Canyon	Regional Top	R-61 S1	1125.0	11/20/2019	REG	F	INIT	Geninorg	Nitrate-Nitrite as Nitrogen	NO3+NO2-N	2.36	1.2	LANL Reg BG LVL	0.8	3.1	0.17	mg/L	10.00		NQ	NQ	EPA:353.2	GELC	
C4	40	46	05/20/2011	2.96	16.20	11.40	46	Mortandad Canyon	Regional Top	R-61 S1	1125.0	12/09/2019	FD	F	INIT	Geninorg	Perchlorate	CIO4	13.10	1.1	LANL Reg BG LVL	0.4	31.6	0.50	µg/L	10.0		NQ	NQ	SW-846:6850	GELC	

Table 1: NMED 01-20 Groundwater Report

Criteria Code	Visits	Samples	First Event	Min Detect	Max Detect	Median Detect	Num Detect	Canyon	Zone	Location	Screen Depth	Start Date	Fld QC Type Code	Fld Prep Code	Lab Sample Type Code	Anyl Suite Code	Analyte Desc	Analyte	Std Result	Result/Median	LVL Type/Risk Code	Screen Level	Exceedance Ratio	Std MDL	Std UOM	Dilution Factor	Lab Qualifier	Validation Qualifier	Validation Reason Code	Anyl Meth Code	Lab Code	Comment
C4	40	46	05/20/2011	2.96	16.20	11	46	Mortandad Canyon	Regional Top	R-61 S1	1125.0	12/09/2019	REG	F	INIT	Geninorg	Perchlorate	CIO4	13.60	1.2	LANL Reg BG LVL	0.4	32.9	0.50	µg/L	10.00		NQ	NQ	SW-846:6850	GELC	
C4	40	46	05/20/2011	2.96	16.20	11.4	46	Mortandad Canyon	Regional Top	R-61 S1	1125.0	11/20/2019	REG	F	INIT	Geninorg	Perchlorate	CIO4	12.50	1.1	LANL Reg BG LVL	0.4	30.2	0.50	µg/L	10.00		J	PE12e	SW-846:6850	GELC	

Table 2: NMED 01-20 Groundwater Report Addendum

Criteria Code	Visits	Samples	First Event	Min Detect	Max Detect	Median Detect	Num Detect	Canyon	Zone	Location	Screen Depth	Start Date	Fld QC Type Code	Fld Prep Code	Lab Sample Type Code	Anyl Suite Code	Analyte Desc	Analyte	Std Result	Result/Median	LVL Type/Risk Code	Screen Level	Exceedance Ratio	Std MDL	Std UOM	Dilution Factor	Lab Qualifier	Validation Qualifier	Validation Reason Code	Anyl Meth Code	Lab Code	Comment
XC2scr	12	13	6/25/2010	2.43	2.71	2.57	2	Pajarito Canyon	Regional Deep	R-57 S2	971.5	10/18/2019	REG	F	INIT	Metals	Arsenic	As	2.71	1.1	Reg-Scr_95	2.7	1	2	µg/L	1	J	J	J_LAB	SW-846:6020B	GELC	
XC2scr	14	14	9/26/2000	1.88	2.86	2.24	3	White Rock Canyon and Rio Grande	Regional Spring	Spring 8A	0	10/2/2019	REG	F	INIT	Metals	Arsenic	As	2.86	1.3	Reg-Scr_95	2.7	1.1	2	µg/L	1	J	J	J_LAB	SW-846:6020B	GELC	
XC2scr	24	30	3/11/2009	10.5	20.7	19.4	3	Mortandad Canyon	Regional Top	R-46	1340	11/21/2019	FD	F	INIT	Metals	Boron	B	20.7	1.1	Reg-Scr_95	18.7	1.1	15	µg/L	1	J	J	J_LAB	SW-846:6010C	GELC	
XC2scr	24	30	3/11/2009	10.5	20.7	19.4	3	Mortandad Canyon	Regional Top	R-46	1340	11/21/2019	REG	F	INIT	Metals	Boron	B	19.4	1	Reg-Scr_95	18.7	1	15	µg/L	1	J	J	J_LAB	SW-846:6010C	GELC	
XC4scr	57	59	2/17/2009	0.0757	0.157	0.138	15	Mortandad Canyon	Regional Top	R-44 S1	895	12/10/2019	REG	F	INIT	Geninorg	Bromide	Br(-1)	0.146	1.1	Reg-Scr_95	0.067	2.2	0.067	mg/L	1	J	J	J_LAB	EPA:300.0	GELC	
XC4scr	57	59	2/17/2009	0.0757	0.157	0.138	15	Mortandad Canyon	Regional Top	R-44 S1	895	11/20/2019	REG	F	INIT	Geninorg	Bromide	Br(-1)	0.157	1.1	Reg-Scr_95	0.067	2.3	0.067	mg/L	1	J	J+	I6b	EPA:300.0	GELC	
XC4scr	24	30	3/11/2009	1.38	5.29	3.255	26	Mortandad Canyon	Regional Top	R-46	1340	11/21/2019	FD	F	INIT	Metals	Antimony	Sb	2.21	0.7	Reg-Scr_95	1	2.2	1	µg/L	1	J	J	J_LAB	SW-846:6020B	GELC	
XC4scr	24	30	3/11/2009	1.38	5.29	3.255	26	Mortandad Canyon	Regional Top	R-46	1340	11/21/2019	REG	F	INIT	Metals	Antimony	Sb	3.12	1	Reg-Scr_95	1	3.1	1	µg/L	1		NQ	NQ	SW-846:6020B	GELC	
XC4scr	41	47	5/20/2011	0.0531	11.8	0.633	44	Mortandad Canyon	Regional Top	R-61 S1	1125	12/9/2019	FD	F	INIT	Geninorg	Total Phosphate as Phosphorus	PO4-P	0.323	0.5	Reg-Scr_95	0.0822	3.9	0.02	mg/L	1		NQ	NQ	EPA:365.4	GELC	
XC4scr	41	47	5/20/2011	0.0531	11.8	0.633	44	Mortandad Canyon	Regional Top	R-61 S1	1125	12/9/2019	REG	F	INIT	Geninorg	Total Phosphate as Phosphorus	PO4-P	0.373	0.6	Reg-Scr_95	0.0822	4.5	0.02	mg/L	1		NQ	NQ	EPA:365.4	GELC	
XC4scr	41	47	5/20/2011	0.0531	11.8	0.633	44	Mortandad Canyon	Regional Top	R-61 S1	1125	11/20/2019	REG	F	INIT	Geninorg	Total Phosphate as Phosphorus	PO4-P	0.322	0.5	Reg-Scr_95	0.0822	3.9	0.02	mg/L	1		NQ	NQ	EPA:365.4	GELC	