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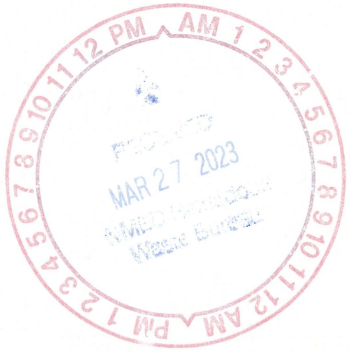
DEPARTMENT OF ENERGY

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



EMLA-23-BF148-2-1

March 27, 2023

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

Subject: Response to New Mexico Environment Department Comments on the Review 2022 Annual Periodic Monitoring Report for Baseflow Sampling: Los Alamos Canyon, Sandia Canyon, Water Canyon, White Rock Canyon, and Pajarito Canyon Watershed, Los Alamos National Laboratory, EPA ID# NM0890010515, LANL-22-089 Dated February 7, 2023

Dear Mr. Cobrain:

Enclosed please find the "Response to New Mexico Environment Department Comments on the Review 2022 Annual Periodic Monitoring Report for Baseflow Sampling: Los Alamos Canyon, Sandia Canyon, Water Canyon, White Rock Canyon, and Pajarito Canyon Watershed, Los Alamos National Laboratory, EPA ID# NM0890010515, LANL-22-089 Dated February 7, 2023." The responses directly address NMED comments on the report. No changes to the report are required.

If you have any questions, please contact Amanda White at (505) 309-1366 (amanda.white@em-la.doe.gov) or Hai Shen at (505) 709-7600 (hai.shen@em.doe.gov).

Sincerely,

ARTURO DURAN

Digitally signed by ARTURO DURAN
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Arturo Q. Duran
Compliance and Permitting Manager
U.S. Department of Energy
Environmental Management
Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files – Response to New Mexico Environment Department Comments on the Review 2022 Annual Periodic Monitoring Report for Baseflow Sampling: Los Alamos Canyon, Sandia Canyon, Water Canyon, White Rock Canyon, and Pajarito Canyon Watershed, Los Alamos National Laboratory, EPA ID# NM0890010515, LANL-22-089, Dated February 7, 2023 (EM2023-0146)

cc (letter and enclosure[s] emailed):
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Raymond Martinez, San Ildefonso Pueblo, NM
Dino Chavarria, Santa Clara Pueblo, NM
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Response to New Mexico Environment Department Comments on the Review 2022 Annual Periodic Monitoring Report for Baseflow Sampling: Los Alamos Canyon, Sandia Canyon, Water Canyon, White Rock Canyon, and Pajarito Canyon Watershed, Los Alamos National Laboratory, EPA ID# NM0890010515, LANL-22-089 Dated February 7, 2023

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office responses follow each NMED comment.

SPECIFIC COMMENTS

NMED Comment

1. Section 6.2.1 Surface Water (Base Flow), page 9.

The results reported in Section 6.2.1 Surface water (Base Flow) and, Table 5.2-1 Base-Flow Results Above Screening Levels (page 21) do not match the results reported in Tables C-1, and C-2. Section 6.2.1 and Table 5.2-1 report a concentration 7.6E- 8 µg/L for hepadichlorodibenodioxin [l ,2,3,4,6,7,8-] on October 12, 2021, at Rio Grande at Otowi Bridge. However, NMED notes that the same sample location and date for Tables C-1 and C-2 report a concentration of 5.52E-06 µg/L for hepadichlorodibenodioxin [1,2,3,4,6,7,8-], approximately a 5.44E-06 µg/L difference.

The Permittee must resolve the discrepancy between Section 6.2.1 and the three (3) Tables and must provide a revised Base Flow Monitoring Report for NMED review.

DOE Response

1. As described in section 3.0, toxic equivalents are used to report the toxicity-weighted masses of mixtures of dioxins and furans. This is more meaningful than reporting the number of grams of dioxins or furans because toxic equivalents provide information on toxicity (https://www.epa.gov/toxics-release-inventory-tri-program/2010-dioxin-and-dioxin-compounds-and-teq-data-files). In addition, there are surface water quality standards for a total dioxin toxic equivalent, whereas there are no standards for individual dioxins or furans.

   Total dioxins are calculated using toxic equivalent values as reported in Table 3.0-3. The two detected dioxins at Rio Grande at Otowi Bridge on October 12, 2021, were for heptachlorodibenzodioxin[1,2,3,4,6,7,8] (1,2,3,4,6,7,8-HpCDD), parameter code 35822-46-9, and octachlorodibenzodioxin[1,2,3,4,6,7,8,9-] (OCDD), parameter code 3268-87-9. The toxic equivalents for 1,2,3,4,6,7,8-HpCDD is highlighted in yellow, and the toxic equivalents for OCDD is highlighted in blue.

Table 3.0-3
Toxic equivalents

Analyte	Parameter Code	Toxic Equivalents
2,3,7,8-TCDD	1746-01-6	1
1,2,3,7,8-PeCDD	40321-76-4	1
1,2,3,4,7,8-HxCDD	39227-28-6	0.1
1,2,3,6,7,8-HxCDD	57653-85-7	0.1
1,2,3,7,8,9-HxCDD	19408-74-3	0.1
1,2,3,4,6,7,8-HpCDD	35822-46-9	0.01
OCDD	3268-87-9	0.0003
2,3,7,8-TCDF	51207-31-9	0.1
1,2,3,7,8-PeCDF	57117-41-6	0.03
2,3,4,7,8-PeCDF	57117-31-4	0.3
1,2,3,4,7,8-HxCDF	70648-26-9	0.1
1,2,3,6,7,8-HxCDF	57117-44-9	0.1
1,2,3,7,8,9-HxCDF	72918-21-9	0.1
2,3,4,6,7,8-HxCDF	60851-34-5	0.1
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01
OCDF	39001-02-0	0.0003
3,3',4,4'-TCB (77)	32598-13-3	0.0001
3,4,4',5-TCB (81)	70362-50-4	0.0003
3,3',4,4',5-PeCB (126)	57465-28-8	0.1
3,3',4,4',5,5'-HxCB (169)	32774-16-6	0.03
2,3,3',4,4'-PeCB (105)	32598-14-4	0.00003
2,3,4,4',5-PeCB (114)	74472-37-0	0.00003
2,3',4,4',5-PeCB (118)	31508-00-6	0.00003
2',3,4,4',5-PeCB (123)	65510-44-3	0.00003
2,3,3',4,4', 5 -HXCB (156)	PCB-156/157	0.00003
2,3,3',4,4',5'-HxCB (157)	PCB-156/157	0.00003
2,3',4,4',5,5'-HxCB (167)	52663-72-6	0.00003
2,3,3',4,4',5,5'-HpCB (189)	39635-31-9	0.00003

Toxic equivalents are expressed as 2,3,7,8-TCDD dioxin (https://www.epa.gov/toxics-release-inventory-tri-program/2010-dioxin-and-dioxin-compounds-and-teq-data-files).

As noted in section 5.2.1, for the October 12, 2021, sampling event at Rio Grande at Otowi Bridge, the unfiltered dioxins 1,2,3,4,6,7,8-HpCDD and OCDD were detected. The dioxin criteria apply to the sum of the dioxin toxicity equivalents. The sum of these dioxin toxicity equivalents is 7.6E-08 µg/L, which is above the 5.1E-08 µg/L New Mexico Human Health Organism Only standard.

(concentration of 1,2,3,4,6,7,8-HpCDD x Toxic Equivalents for 1,2,3,4,6,7,8-HpCDD) + (concentration of OCDD x Toxic Equivalents for OCDD)

$$(\mathbf{5.52E-06\ \mu g/L}\ x\ \mathbf{0.01}) + (\mathbf{6.79E-05 \mu g/L}\ x\ \mathbf{0.0003}) = \mathbf{7.6E-08}$$

The report lists the sum of the dioxin toxicity equivalents at Rio Grande at Otowi Bridge in sections 5.2.1 and 6.2.1 and Table 5.2-1 in order to compare the dioxins to the screening levels.

Appendix C Table 1 includes all data collected during each monitoring and sampling event in the reporting period.

Therefore, no revision to the periodic monitoring report (PMR) is required.

NMED Comment

2. Table 2.1-1 Base-Flow Sampling PME Observations and Deviations, page 16.

NMED notes that at several sampling locations, the Permittees were not able to collect samples due to low base-flow or insufficient water in 2022, 2021, and 2020. For example, at LA Canyon near Otowi Bridge, Water at Beta, and Canon de Valle below MDA P, there was either insufficient water to sample or the base-flow was reported as dry in 2022, 2021, and 2020. It is not clear from the report, if more than one attempt was made per quarter to collect these samples.

The Permittees must review low-sampling events and discuss strategy for partial sampling and analysis in the forthcoming Interim Facility-Wide Monitoring Plan, which prioritizes COPCs for the site.

DOE Response

2. Only one attempt was made to collect these samples because of the remote location and exposure to hazards, and to ensure data was collected within a 21-day window for the watershed. The majority of the surface water and spring sampling locations are in remote locations requiring access via the Rio Grande and/or hiking into the location through rugged terrain. Hazards include heat; steep, rugged terrain; sampling near or in the Rio Grande; and venomous snakes or other biological hazards, including poison ivy. In addition, the 2016 Compliance Order on Consent states that all monitoring wells within a watershed or area-specific monitoring group should be sampled within 21 days of the start of the groundwater sampling event. Therefore, multiple attempts are not made throughout the quarter.

   All monitoring work reported in the Base-Flow Sampling PMR was conducted pursuant to the "Interim Facility-Wide Groundwater Monitoring Plan for the 2021 Monitoring Year, October 2020–September 2021, Revision 1" (2021 IFGMP) and the "Interim Facility-Wide Groundwater Monitoring Plan for the 2022 Monitoring Year, October 2021–September 2022, Revision 1" (2022 IFGMP). Strategies for collecting partial sampling and analysis are noted in the IFGMP prioritized sampling suites table.

   As noted in section 5.1 of the PMR, sampling and analysis plans (SAPs) are created using 2021 and 2022 IFGMP Tables 1.8-1, 1.11-1, 6.4-1, and 8.3-1. The base-flow sampling reported in the PMR follow the watershed based prioritized suites listed in the 2021 and 2022 IFGMPs Table 1.11-1. Below is a list of base-flow locations order of prioritized sampling suites.

Location	Monitoring Group	Watershed	Sampling Order
Cañon de Valle below MDA[a] P Between E252 and Water at Beta Water at Beta Pajarito below S&N Ancho E Basin Confluence	TA-16 260	Pajarito/Water Canyons	HEXMOD[b]
			PFAS[c]
			VOCs[d]
			Metals
			General Inorganics
			Low-level tritium
LA Canyon near Otowi Bridge	General Surveillance	Los Alamos	Tritium or low-level tritium
			PFAS
			Metals
			General Inorganics
			Radionuclides (alluvial wells)
Sandia Right Fork at Power Plant Sandia below Wetlands	General Surveillance	Sandia	Metals
			General Inorganics
			PFAS
			VOCs
			SVOCs[e]
Two Mile Canyon Below TA-59	General Surveillance	Pajarito	HEXP
			VOCs
			PFAS
			Tritium or low-level tritium
			Metals
			General Inorganics
Ancho at Rio Grande	General Surveillance	White Rock Canyon	Metals
Frijoles at Rio Grande			General Inorganics
Mortandad at Rio Grande			PFAS
Pajarito at Rio Grande			VOCs
Rio Grande at Frijoles			HEXP
Rio Grande at Otowi Bridge			Low-level tritium

[a] MDA = Material disposal area.

[b] HEXMOD = Analytical suite for high explosives and RDX- (hexahydro-1,3,5-trinitro-1,3,5-triazine) degradation products.

[c] PFAS = Per- and polyfluoroalkyl substances.

[d] VOCs = Volatile organic compounds.

[e] SVOCs = Semivolatile organic compounds.