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Date: January 25, 2022
Refer To: N3B-2022-0016

Justin D. Ball, Acting Chief
Ground Water Quality Bureau
New Mexico Environment Department
1190 S. St. Francis Drive
P.O. Box 5469
Santa Fe, NM 87502-5469

Subject: Discharge Permit DP-1793 Permit Condition #8 Discharge Report for R-28 and R-42 Extended Pumping in 2021

Dear Mr. Ball:

This letter serves as the U.S. Department of Energy Environmental Management Los Alamos Field Office and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) submittal of information required under Discharge Permit 1793 (DP-1793). DP-1793 Permit Condition #8 requires a discharge report to be submitted within 60 days of completing the discharge. During the period of October 8, 2021, through November 30, 2021, land application of treated water under DP-1793 occurred to discharge water generated from extended pumping activities at monitoring wells R-28 and R-42. DP-1793 Permit Condition #8 requires that the following information be submitted in a discharge report:

1. The total volume of groundwater discharged
2. An estimated average application rate for the period of discharge
3. Analytical results from samples collected under the water quality sampling plan or soil sampling, if required by the New Mexico Environment Department (NMED)
4. A map depicting areas that received land-applied groundwater

Each requirement is addressed below.

Requirement Number 1: The total volume of groundwater discharged

The total amount of treated groundwater land-applied for the R-28 and R-42 extending pumping discharge was 251,473 gal.

Requirement Number 2: An estimated average application rate for the period of discharge

Treated groundwater was land-applied over 53 days from October 8, 2021, to November 30, 2021. The average land-application rate for 251,473 gal. over 53 days is 4745 gal. per day.

Requirement Number 3: Analytical results from samples collected under the water quality sampling plan or soil sampling, if required by NMED

Analytical results from samples collected under DP-1793 Work Plan #5 as modified by NMED's Ground Water Quality Bureau (GWQB) approval of "Amendment 3 to Work Plan #5, Discharge Permit 1793, Inclusion of an Additional Water Source," on July 13, 2021, are shown in Enclosure 1. The data show that concentrations for perchlorate, chromium, iron, and manganese all met the permit limit for land application. The one exception was the nitrate-nitrite as nitrogen (nitrate) concentration; however, when the Hach method for real-time field results was used before land application, all concentrations met the permit limit for land application.

The first sample, collected on October 7, 2021, during the land application period presented in this report, had a nitrate value of 9.35 mg/L, slightly over 90% of the groundwater standard permit limit of 9 mg/L, as specified within the introduction statement to DP-1793. The groundwater standard for nitrate is 10 mg/L, found in Section 20.6.2.3103 of the New Mexico Administrative Code. Results from the next three samples were 6.23 mg/L (collected on October 12, 2021), 5.53 mg/L (collected on October 19, 2021), and 4.51 mg/L (collected on November 24, 2021).

The first sample was collected at the initiation of treatment through the ion-exchange vessels, after an extended period of not operating. Observations from prior experience with ion-exchange treatment indicate an initial breakthrough of comparatively elevated nitrate values followed quickly by lower concentrations. Based in part on the subsequent sample results for nitrate, this is likely what occurred. This is further suggested by the fact that the 9.35-mg/L value for nitrate is higher than values of nitrate seen from either R-28 (<1.5 mg/L) or R-42 (<8.0 mg/L) in samples collected at the wellheads during the extended pumping activities. Additionally, as mentioned above, the nitrate values obtained via the Hach method for real-time results before land application (5.37, taken on October 8, 2021; and 5.3, taken on October 9, 2021), met the permit limit for land application.

Note that NMED-GWQB's "Approval with Modification of Work Plan #5 for Treatment and Land Application of Groundwater at TA-05, Los Alamos National Laboratory, Discharge Permit 1793," dated June 15, 2017, states the following:

> The Permittees shall confirm that waters in lagoons do not exceed the numeric standards of 20.6.2.3103 NMAC for chromium and nitrate prior to land application. To perform this confirmation the Permittees shall collect a representative sample of water in a lagoon and analyze the sample utilizing the Hach method for real time field results.

As required by NMED-GWQB's approval of the land application plan, soil sampling for iron, manganese, and chromium will be performed in the areas where land application occurred. The soil sampling results will be provided to NMED-GWQB upon completion and validation of the sample results.

Requirement Number 4: A map depicting areas that received land-applied groundwater

Enclosure 2 provides a map of the land-application zones within Mortandad Canyon. Groundwater was land applied in Zone 4.

If you have questions, please contact Christian Maupin at (505) 695-4281 (christian.maupin@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

Joseph Murdock
Program Manager
Environment, Safety and Health
N3B-Los Alamos

Sincerely,

ARTURO DURAN Digitally signed by ARTURO DURAN
Date: 2022.01.25 12:47:23 -07'00'

Arturo Q. Duran
Office of Quality and Regulatory Compliance
U.S. Department of Energy
Environmental Management
Los Alamos Field Office

Enclosure(s):
1. Discharge Analytical Results for R-28 and R-42 Extended Pumping Activities
2. Land-Application Zones within Mortandad Canyon

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
Steve Yanicak, NMED-DOE-OB
Patrick Longmire, NMED-GWQB
Andrew Romero, NMED-GWQB
Neelam Dhawan, NMED-HWB
Rick Shean, NMED-HWB
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Shelly Lemon, NMED-SWQB
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Public Reading Room (EPRR)
PRS website

ENCLOSURE 1

Discharge Analytical Results for R-28 and R-42
Extended Pumping Activities

Discharge Analytical Results for R-28 and R-42 Extended Pumping Activities

Location ID	Sample ID	Sample Date	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUB	CTU6B-22-235487	10/07/2021	Perchlorate	0.063	µg/L	12.4 µg/L	J[a]	Y[b]	Yes	0.05
CTUB	CTU6B-22-235487	10/07/2021	Chromium	3.0	µg/L	45 µg/L	U[c]	N[d]	Yes	3.0
CTUB	CTU6B-22-235487	10/07/2021	Iron	30.0	µg/L	900 µg/L	U	N	Yes	30.0
CTUB	CTU6B-22-235487	10/07/2021	Manganese	42.5	µg/L	180 µg/L	n/a[e]	Y	Yes	2.0
CTUB	CTU6B-22-235487	10/07/2021	Nitrate-nitrite as nitrogen	9.35	mg/L	9 mg/L	n/a	Y	Yes	0.17
CTUB	CTU6B-22-235489	10/12/2021	Perchlorate	0.053	µg/L	12.4 µg/L	J	Y	Yes	0.05
CTUB	CTU6B-22-235489	10/12/2021	Chromium	3.0	µg/L	45 µg/L	U	N	Yes	3.0
CTUB	CTU6B-22-235489	10/12/2021	Iron	30.0	µg/L	900 µg/L	U	N	Yes	30.0
CTUB	CTU6B-22-235489	10/12/2021	Manganese	76.6	µg/L	180 µg/L	n/a	Y	Yes	2.0
CTUB	CTU6B-22-235489	10/12/2021	Nitrate-nitrite as nitrogen	6.23	mg/L	9 mg/L	n/a	Y	Yes	0.425
CTUB	CTU6B-22-235488	10/19/2021	Perchlorate	0.05	µg/L	12.4 µg/L	U	N	Yes	0.05
CTUB	CTU6B-22-235488	10/19/2021	Chromium	3.0	µg/L	45 µg/L	U	N	Yes	3.0
CTUB	CTU6B-22-235488	10/19/2021	Iron	30.0	µg/L	900 µg/L	U	N	Yes	30.0
CTUB	CTU6B-22-235488	10/19/2021	Manganese	88.0	µg/L	180 µg/L	n/a	Y	Yes	2.0
CTUB	CTU6B-22-235488	10/19/2021	Nitrate-nitrite as nitrogen	5.53	mg/L	9 mg/L	n/a	Y	Yes	0.17
CTUB	CTU6B-22-235490	11/24/2021	Perchlorate	0.05	µg/L	12.4 µg/L	U	N	Yes	0.05
CTUB	CTU6B-22-235490	11/24/2021	Chromium	3.0	µg/L	45 µg/L	U	N	Yes	3.0
CTUB	CTU6B-22-235490	11/24/2021	Iron	30.0	µg/L	900 µg/L	U	N	Yes	30.0
CTUB	CTU6B-22-235490	11/24/2021	Manganese	113.0	µg/L	180 µg/L	n/a	Y	Yes	2.0
CTUB	CTU6B-22-235490	11/24/2021	Nitrate-nitrite as nitrogen	4.51	mg/L	9 mg/L	n/a	Y	Yes	0.17

[a] J = Analyte is classified as estimated.

[b] Y = Yes (detected).

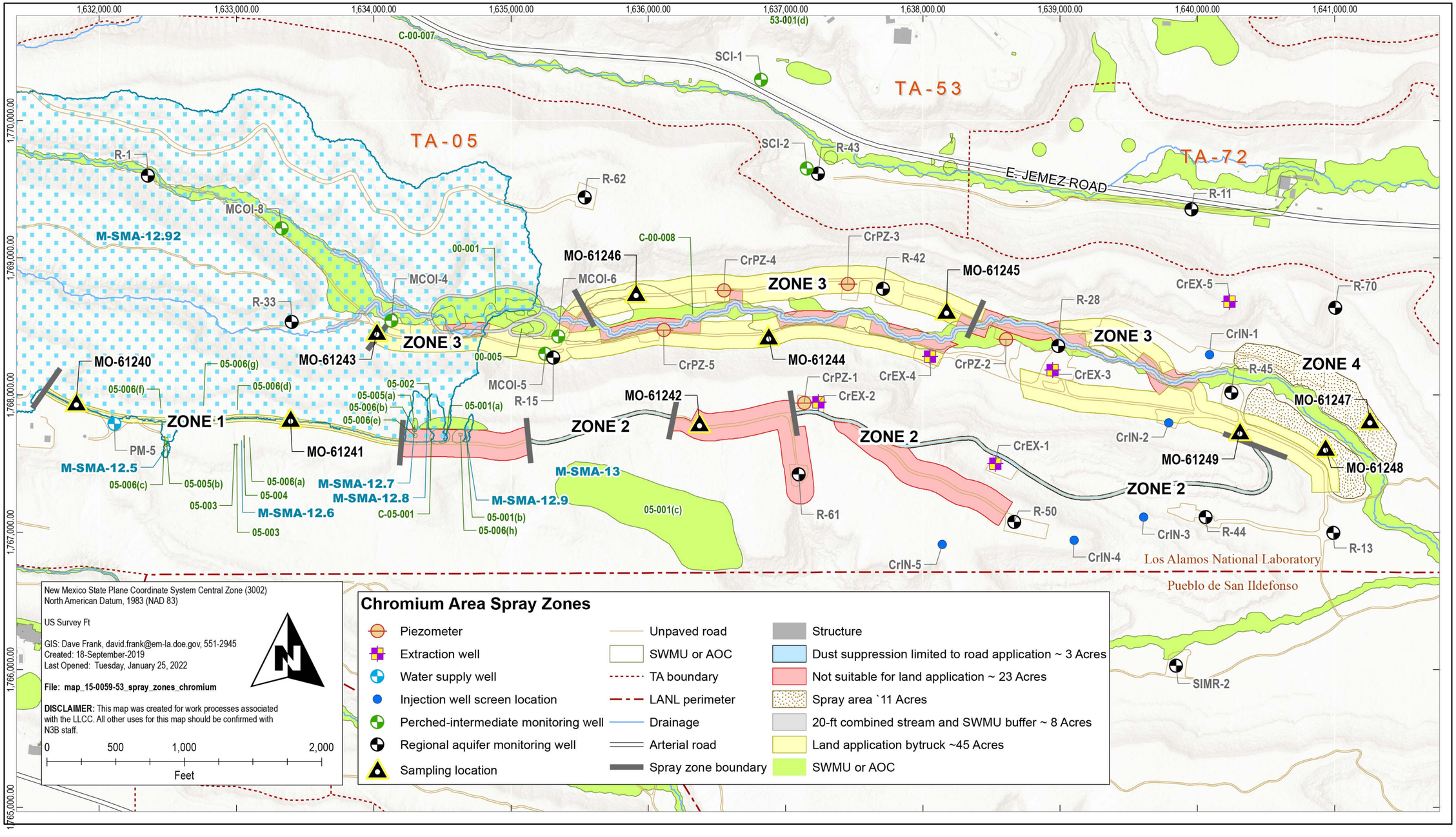
[c] U = Analyte is classified as not detected.

[d] N = No (not detected).

[e] n/a = Not applicable: no qualifiers applied.

ENCLOSURE 2

Land-Application Zones within Mortandad Canyon



Land-application zones within Mortandad Canyon