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Date: September 1, 2022
Refer To: N3B-2022-0326

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

Subject: Submittal of the Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 2, Class V Underground Injection Control Wells

Dear Mr. Ball:

On August 31, 2016, the New Mexico Environment Department (NMED) issued Discharge Permit 1835 (DP-1835) to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) for the discharge of treated groundwater to the regional aquifer from up to six Class V underground injection control (UIC) wells. On July 21, 2017, NMED approved minor updates to DP-1835. During the second quarter of calendar year (CY) 2018, ownership of the discharge permit transferred to Newport News Nuclear BWXT-Los Alamos, LLC (N3B) from LANS. Pursuant to Condition Number 10 of the above-referenced discharge permit, DOE/N3B are required to submit quarterly reports for the previous quarter to document the following:

1. influent and discharge volumes from the treatment systems,
2. quarterly groundwater and treated effluent sampling results, and
3. operations and maintenance activities.

Pursuant to Condition Numbers No. 11, 12, and 13 of DP-1835, the quarterly reports shall also contain general information, performance information, and monitoring data for treated effluent from each ion exchange treatment system. Condition Number 10 requires submission of a quarterly report to NMED by September 1, 2022, for the April 1 through June 30, 2022, discharge period.

During the CY 2022 Quarter 2 reporting period for DP-1835, discharge of treated groundwater to the regional aquifer occurred at five UIC wells: CrIN-1 through CrIN-5. Groundwater originated predominantly from five extraction wells: CrEX-1 through CrEX-5. The groundwater was treated by chromium treatment unit A (CTUA) and chromium treatment unit C (CTUC) before injection at the UIC wells.

The enclosed "Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 2," provides the information required under DP-1835 for this reporting period.

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,

Robert Macfarlane
Program Manager
Environment, Safety, Health and Quality
N3B-Los Alamos

Sincerely,

ARTURO DURAN
Digitally signed by ARTURO DURAN
Date: 2022.09.01 07:59:40 -06'00'

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

Enclosure(s):
1. Two hard copies with electronic files – Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 2 (EM2022-0586)

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
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September 2022
EM2022-0586

Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 2

N3B Los Alamos

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1.0 INTRODUCTION

On August 31, 2016, the New Mexico Environment Department (NMED) issued Discharge Permit 1835 (DP-1835) to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) for the discharge of treated groundwater to the regional aquifer through Class V underground injection control (UIC) wells. On July 21, 2017, NMED approved minor updates to DP-1835. During Quarter 2 of calendar year (CY) 2018, ownership of the discharge permit transferred from LANS to Newport News Nuclear BWXT-Los Alamos, LLC (N3B).

During the CY 2022 Quarter 2 reporting period for DP-1835, groundwater was extracted for treatment from five extraction wells: CrEX-1 through CrEX-5. The groundwater was treated by ion exchange (IX) in chromium treatment unit A (CTUA) and chromium treatment unit C (CTUC). Discharge of treated groundwater to the regional aquifer occurred at five UIC wells: CrIN-1 through CrIN-5.

Condition No. 10 of DP-1835 requires submission of a quarterly report to NMED by September 1 for the April 1 through June 30 discharge period. Several conditions within the permit identify information to be submitted in the quarterly report. These conditions are addressed in this report in the following requirements:

1. Influent and discharge volumes for the IX treatment systems (Condition No. 10)
2. Quarterly treated effluent sampling results from each IX treatment system (Conditions No. 10 and 13)
3. Quarterly depth-to-groundwater and groundwater-quality sampling results (Conditions No. 10 and 14)
4. Any operations/maintenance activities performed (Condition No. 10)
5. Any periodic test of mechanical integrity conducted (Condition No. 11.a)
6. Any replacement of primary or secondary IX vessels or associated treatment system infrastructure (Condition No. 11.b)
7. Any well workovers conducted (Condition No. 11.c)
8. Any additional operational changes with the potential to markedly affect the discharge (Condition No. 11.d)
9. Monthly average, maximum, and minimum values for flow rate and volume of treated effluent transferred to each UIC well (Condition No. 12.a)
10. Total monthly volume of treated effluent transferred to each UIC well (Condition No. 12.b)
11. Monthly average, maximum, and minimum values of injection water level (pressure head) above static level for each UIC well (Condition No. 12.c)
12. Daily volume injected at each UIC well (Condition No. 12.d)
13. Daily volume pumped from each extraction well (Condition No. 12.e)
14. Facility layout map (Condition No. 14)
15. Groundwater elevation contour map (Condition No. 15)

This report addresses each of these requirements.

2.0 REQUIREMENTS

2.1 Influent and Discharge Volumes for the Ion Exchange Treatment Systems (Requirement 1)

Table 2.1-1 provides the influent and discharge volumes for IX treatment systems CTUA and CTUC during CY 2022 Quarter 2 for activities completed under DP-1835.

Table 2.1-1
Total Influent and Discharge Volumes
for IX Treatment Systems – CY 2022 Quarter 2, DP-1835

Treatment Unit	Influent Volume[a] (gal.)	Effluent Volume[b] (gal.)
CTUA	29,302,181	16,926,013
CTUC		12,377,963

Note: Individual flow meter accurate to ±5%.

[a] Influent volume based on CrEX-1 through CrEX-5 extraction volumes.

[b] Effluent volume based on CTUA and CTUC flow-meter readings.

2.2 Quarterly Treated Effluent Sampling Results from Each IX Treatment System (Requirement 2)

Treated effluent analytical results from samples collected during CY 2022 Quarter 2 for activities completed under DP-1835 are summarized in Table 2.2-1. No sample results for total chromium, nitrate, perchlorate, sulfate, fluoride, chloride, or total dissolved solids exceeded 90% of the numeric standards of 20.6.2.3103 New Mexico Administrative Code (NMAC) or, for constituents not listed in 20.6.2.3103 NMAC, 90% of the numeric screening levels established for tap water in Table A-1 of the 2022 NMED "Risk Assessment Guidance for Site Investigations and Remediation Volume 1, Soil Screening Guidance for Human Health Risk Assessments" (NMED 2022). The 90% values for these seven analytes are as follows:

- Chloride 225 mg/L
- Chromium 45 µg/L
- Fluoride 1.44 mg/L
- Nitrate 9 mg/L
- Perchlorate 12.4 µg/L
- Sulfate 540 mg/L
- Total dissolved solids 900 mg/L

Table 2.2-1
Treated Effluent Analytical Results Summary Table – CY 2022 Quarter 2, DP-1835

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239613	4/04/2022	Chloride	72.6	mg/L	225	n/a[b]	Y[c]	Y[d]	0.670
CTUA	CTUA-22-239614	4/13/2022	Chloride	18.1	mg/L	225	n/a	Y	Y	0.335
CTUA	CTUA-22-239615	4/19/2022	Chloride	18.4	mg/L	225	n/a	Y	Y	0.335
CTUA	CTUA-22-239616	4/26/2022	Chloride	18.1	mg/L	225	n/a	Y	Y	0.335
CTUA	CTUA-22-239617	5/02/2022	Chloride	18.9	mg/L	225	n/a	Y	Y	0.335
CTUA	CTUA-22-239618	5/18/2022	Chloride	18.8	mg/L	225	n/a	Y	Y	0.335
CTUA	CTUA-22-239619	5/24/2022	Chloride	18.8	mg/L	225	n/a	Y	Y	0.335
CTUA	CrTMT-22-252146	6/02/2022	Chloride	18.2	mg/L	225	n/a	Y	Y	0.335
CTUA	CrTMT-22-252147	6/07/2022	Chloride	18.1	mg/L	225	n/a	Y	Y	0.335
CTUA	CrTMT-22-252148	6/14/2022	Chloride	17.9	mg/L	225	n/a	Y	Y	0.335
CTUA	CrTMT-22-252149	6/21/2022	Chloride	18.4	mg/L	225	n/a	Y	Y	0.134
CTUA	CrTMT-22-252150	6/28/2022	Chloride	18.8	mg/L	225	n/a	Y	Y	0.134
CTUC	CTUC-22-239629	4/04/2022	Chloride	19.2	mg/L	225	n/a	Y	Y	0.335
CTUC	CTUC-22-239630	4/13/2022	Chloride	57.1	mg/L	225	n/a	Y	Y	0.670
CTUC	CTUC-22-239631	4/19/2022	Chloride	18.5	mg/L	225	n/a	Y	Y	0.335
CTUC	CTUC-22-239632	4/26/2022	Chloride	18.1	mg/L	225	n/a	Y	Y	0.335
CTUC	CTUC-22-239633	5/02/2022	Chloride	18.9	mg/L	225	n/a	Y	Y	0.335
CTUC	CTUC-22-239634	5/18/2022	Chloride	18.8	mg/L	225	n/a	Y	Y	0.335
CTUC	CTUC-22-239635	5/24/2022	Chloride	18.8	mg/L	225	n/a	Y	Y	0.335
CTUC	CrTMT-22-252128	6/02/2022	Chloride	18.1	mg/L	225	n/a	Y	Y	0.335
CTUC	CrTMT-22-252129	6/07/2022	Chloride	18.2	mg/L	225	n/a	Y	Y	0.335
CTUC	CrTMT-22-252130	6/14/2022	Chloride	17.7	mg/L	225	n/a	Y	Y	0.335
CTUC	CrTMT-22-252131	6/21/2022	Chloride	17.1	mg/L	225	n/a	Y	Y	0.335
CTUC	CrTMT-22-252132	6/28/2022	Chloride	18.2	mg/L	225	n/a	Y	Y	0.335

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239613	4/04/2022	Chromium	3.00	µg/L	45	U[e]	N[f]	Y	3.00
CTUA	CTUA-22-239614	4/13/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CTUA-22-239615	4/19/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CTUA-22-239616	4/26/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CTUA-22-239617	5/02/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CTUA-22-239618	5/18/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CTUA-22-239619	5/24/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CrTMT-22-252146	6/02/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CrTMT-22-252147	6/07/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CrTMT-22-252148	6/14/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CrTMT-22-252149	6/21/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CrTMT-22-252150	6/28/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CTUC-22-239629	4/04/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CTUC-22-239630	4/13/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CTUC-22-239631	4/19/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CTUC-22-239632	4/26/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CTUC-22-239633	5/02/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CTUC-22-239634	5/18/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CTUC-22-239635	5/24/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CrTMT-22-252128	6/02/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CrTMT-22-252129	6/07/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CrTMT-22-252130	6/14/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CrTMT-22-252131	6/21/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUC	CrTMT-22-252132	6/28/2022	Chromium	3.00	µg/L	45	U	N	Y	3.00
CTUA	CTUA-22-239613	4/04/2022	Fluoride	0.309	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CTUA-22-239614	4/13/2022	Fluoride	0.332	mg/L	1.44	n/a	Y	Y	0.0330

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239615	4/19/2022	Fluoride	0.261	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CTUA-22-239616	4/26/2022	Fluoride	0.370	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CTUA-22-239617	5/02/2022	Fluoride	0.368	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CTUA-22-239618	5/18/2022	Fluoride	0.382	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CTUA-22-239619	5/24/2022	Fluoride	0.334	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CrTMT-22-252146	6/02/2022	Fluoride	0.449	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CrTMT-22-252147	6/07/2022	Fluoride	0.455	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CrTMT-22-252148	6/14/2022	Fluoride	0.364	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CrTMT-22-252149	6/21/2022	Fluoride	0.373	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CrTMT-22-252150	6/28/2022	Fluoride	0.278	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CTUC-22-239629	4/04/2022	Fluoride	0.292	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CTUC-22-239630	4/13/2022	Fluoride	0.354	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CTUC-22-239631	4/19/2022	Fluoride	0.259	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CTUC-22-239632	4/26/2022	Fluoride	0.370	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CTUC-22-239633	5/02/2022	Fluoride	0.363	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CTUC-22-239634	5/18/2022	Fluoride	0.365	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CTUC-22-239635	5/24/2022	Fluoride	0.335	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CrTMT-22-252128	6/02/2022	Fluoride	0.466	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CrTMT-22-252129	6/07/2022	Fluoride	0.464	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CrTMT-22-252130	6/14/2022	Fluoride	0.369	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CrTMT-22-252131	6/21/2022	Fluoride	0.371	mg/L	1.44	n/a	Y	Y	0.0330
CTUC	CrTMT-22-252132	6/28/2022	Fluoride	0.276	mg/L	1.44	n/a	Y	Y	0.0330
CTUA	CTUA-22-239613	4/04/2022	Nitrate-Nitrite as Nitrogen	0.0170	mg/L	9	U	N	Y	0.0170
CTUA	CTUA-22-239614	4/13/2022	Nitrate-Nitrite as Nitrogen	3.19	mg/L	9	n/a	Y	Y	0.170
CTUA	CTUA-22-239615	4/19/2022	Nitrate-Nitrite as Nitrogen	3.18	mg/L	9	n/a	Y	Y	0.170
CTUA	CTUA-22-239616	4/26/2022	Nitrate-Nitrite as Nitrogen	3.07	mg/L	9	n/a	Y	Y	0.0850

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239617	5/02/2022	Nitrate-Nitrite as Nitrogen	3.16	mg/L	9	n/a	Y	Y	0.0850
CTUA	CTUA-22-239618	5/18/2022	Nitrate-Nitrite as Nitrogen	3.15	mg/L	9	n/a	Y	Y	0.170
CTUA	CTUA-22-239619	5/24/2022	Nitrate-Nitrite as Nitrogen	3.42	mg/L	9	n/a	Y	Y	0.170
CTUA	CrTMT-22-252146	6/02/2022	Nitrate-Nitrite as Nitrogen	3.30	mg/L	9	n/a	Y	Y	0.170
CTUA	CrTMT-22-252147	6/07/2022	Nitrate-Nitrite as Nitrogen	3.19	mg/L	9	n/a	Y	Y	0.170
CTUA	CrTMT-22-252148	6/14/2022	Nitrate-Nitrite as Nitrogen	3.13	mg/L	9	n/a	Y	Y	0.170
CTUA	CrTMT-22-252149	6/21/2022	Nitrate-Nitrite as Nitrogen	3.20	mg/L	9	n/a	Y	Y	0.0850
CTUA	CrTMT-22-252150	6/28/2022	Nitrate-Nitrite as Nitrogen	3.29	mg/L	9	n/a	Y	Y	0.170
CTUC	CTUC-22-239629	4/04/2022	Nitrate-Nitrite as Nitrogen	3.23	mg/L	9	n/a	Y	Y	0.170
CTUC	CTUC-22-239630	4/13/2022	Nitrate-Nitrite as Nitrogen	0.0170	mg/L	9	U	N	Y	0.0170
CTUC	CTUC-22-239631	4/19/2022	Nitrate-Nitrite as Nitrogen	3.14	mg/L	9	n/a	Y	Y	0.170
CTUC	CTUC-22-239632	4/26/2022	Nitrate-Nitrite as Nitrogen	2.99	mg/L	9	n/a	Y	Y	0.0850
CTUC	CTUC-22-239633	5/02/2022	Nitrate-Nitrite as Nitrogen	2.97	mg/L	9	n/a	Y	Y	0.0850
CTUC	CTUC-22-239634	5/18/2022	Nitrate-Nitrite as Nitrogen	3.10	mg/L	9	n/a	Y	Y	0.170
CTUC	CTUC-22-239635	5/24/2022	Nitrate-Nitrite as Nitrogen	3.49	mg/L	9	n/a	Y	Y	0.170
CTUC	CrTMT-22-252128	6/02/2022	Nitrate-Nitrite as Nitrogen	3.21	mg/L	9	n/a	Y	Y	0.170
CTUC	CrTMT-22-252129	6/07/2022	Nitrate-Nitrite as Nitrogen	3.27	mg/L	9	n/a	Y	Y	0.170
CTUC	CrTMT-22-252130	6/14/2022	Nitrate-Nitrite as Nitrogen	3.15	mg/L	9	n/a	Y	Y	0.170
CTUC	CrTMT-22-252131	6/21/2022	Nitrate-Nitrite as Nitrogen	3.21	mg/L	9	n/a	Y	Y	0.0850
CTUC	CrTMT-22-252132	6/28/2022	Nitrate-Nitrite as Nitrogen	3.73	mg/L	9	n/a	Y	Y	0.170
CTUA	CTUA-22-239613	4/04/2022	Perchlorate	0.102	µg/L	12.4	J[g]	Y	Y	0.0500
CTUA	CTUA-22-239614	4/13/2022	Perchlorate	0.364	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CTUA-22-239615	4/19/2022	Perchlorate	0.388	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CTUA-22-239616	4/26/2022	Perchlorate	0.384	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CTUA-22-239617	5/02/2022	Perchlorate	0.402	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CTUA-22-239618	5/18/2022	Perchlorate	0.446	µg/L	12.4	n/a	Y	Y	0.0500

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239619	5/24/2022	Perchlorate	0.471	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CrTMT-22-252146	6/02/2022	Perchlorate	0.530	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CrTMT-22-252147	6/07/2022	Perchlorate	0.432	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CrTMT-22-252148	6/14/2022	Perchlorate	0.413	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CrTMT-22-252149	6/21/2022	Perchlorate	0.410	µg/L	12.4	n/a	Y	Y	0.0500
CTUA	CrTMT-22-252150	6/28/2022	Perchlorate	0.400	µg/L	12.4	n/a	Y	Y	0.0500
CTUC	CTUC-22-239629	4/04/2022	Perchlorate	1.03	µg/L	12.4	n/a	Y	Y	0.0500
CTUC	CTUC-22-239630	4/13/2022	Perchlorate	0.0500	µg/L	12.4	U	N	Y	0.0500
CTUC	CTUC-22-239631	4/19/2022	Perchlorate	0.0500	µg/L	12.4	U	N	Y	0.0500
CTUC	CTUC-22-239632	4/26/2022	Perchlorate	0.0500	µg/L	12.4	U	N	Y	0.0500
CTUC	CTUC-22-239633	5/02/2022	Perchlorate	0.0500	µg/L	12.4	U	N	Y	0.0500
CTUC	CTUC-22-239634	5/18/2022	Perchlorate	0.0500	µg/L	12.4	U	N	Y	0.0500
CTUC	CTUC-22-239635	5/24/2022	Perchlorate	0.0500	µg/L	12.4	U	N	Y	0.0500
CTUC	CrTMT-22-252128	6/02/2022	Perchlorate	0.205	µg/L	12.4	n/a	Y	Y	0.0500
CTUC	CrTMT-22-252129	6/07/2022	Perchlorate	0.208	µg/L	12.4	n/a	Y	Y	0.0500
CTUC	CrTMT-22-252130	6/14/2022	Perchlorate	0.203	µg/L	12.4	n/a	Y	Y	0.0500
CTUC	CrTMT-22-252131	6/21/2022	Perchlorate	0.197	µg/L	12.4	J	Y	Y	0.0500
CTUC	CrTMT-22-252132	6/28/2022	Perchlorate	0.105	µg/L	12.4	J	Y	Y	0.0500
CTUA	CTUA-22-239613	4/04/2022	Sulfate	0.133	mg/L	540	U	N	Y	0.133
CTUA	CTUA-22-239614	4/13/2022	Sulfate	24.9	mg/L	540	n/a	Y	Y	0.665
CTUA	CTUA-22-239615	4/19/2022	Sulfate	25.1	mg/L	540	n/a	Y	Y	0.665
CTUA	CTUA-22-239616	4/26/2022	Sulfate	23.6	mg/L	540	n/a	Y	Y	0.665
CTUA	CTUA-22-239617	5/02/2022	Sulfate	25.7	mg/L	540	n/a	Y	Y	0.665
CTUA	CTUA-22-239618	5/18/2022	Sulfate	25.4	mg/L	540	n/a	Y	Y	0.665
CTUA	CTUA-22-239619	5/24/2022	Sulfate	24.7	mg/L	540	n/a	Y	Y	0.665
CTUA	CrTMT-22-252146	6/02/2022	Sulfate	24.9	mg/L	540	n/a	Y	Y	0.665

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CrTMT-22-252147	6/07/2022	Sulfate	25.3	mg/L	540	n/a	Y	Y	0.665
CTUA	CrTMT-22-252148	6/14/2022	Sulfate	24.3	mg/L	540	n/a	Y	Y	0.665
CTUA	CrTMT-22-252149	6/21/2022	Sulfate	24.2	mg/L	540	n/a	Y	Y	0.266
CTUA	CrTMT-22-252150	6/28/2022	Sulfate	25.4	mg/L	540	n/a	Y	Y	0.266
CTUC	CTUC-22-239629	4/04/2022	Sulfate	26.4	mg/L	540	n/a	Y	Y	0.665
CTUC	CTUC-22-239630	4/13/2022	Sulfate	0.133	mg/L	540	U	N	Y	0.133
CTUC	CTUC-22-239631	4/19/2022	Sulfate	24.7	mg/L	540	n/a	Y	Y	0.665
CTUC	CTUC-22-239632	4/26/2022	Sulfate	23.6	mg/L	540	n/a	Y	Y	0.665
CTUC	CTUC-22-239633	5/02/2022	Sulfate	25.7	mg/L	540	n/a	Y	Y	0.665
CTUC	CTUC-22-239634	5/18/2022	Sulfate	25.2	mg/L	540	n/a	Y	Y	0.665
CTUC	CTUC-22-239635	5/24/2022	Sulfate	24.5	mg/L	540	n/a	Y	Y	0.665
CTUC	CrTMT-22-252128	6/02/2022	Sulfate	24.9	mg/L	540	n/a	Y	Y	0.665
CTUC	CrTMT-22-252129	6/07/2022	Sulfate	25.4	mg/L	540	n/a	Y	Y	0.665
CTUC	CrTMT-22-252130	6/14/2022	Sulfate	24.1	mg/L	540	n/a	Y	Y	0.665
CTUC	CrTMT-22-252131	6/21/2022	Sulfate	23.7	mg/L	540	n/a	Y	Y	0.665
CTUC	CrTMT-22-252132	6/28/2022	Sulfate	15.5	mg/L	540	n/a	Y	Y	0.133
CTUA	CTUA-22-239613	4/04/2022	Total Dissolved Solids	266	mg/L	900	n/a	Y	Y	3.40
CTUA	CTUA-22-239614	4/13/2022	Total Dissolved Solids	229	mg/L	900	n/a	Y	Y	3.40
CTUA	CTUA-22-239615	4/19/2022	Total Dissolved Solids	240	mg/L	900	n/a	Y	Y	3.40
CTUA	CTUA-22-239616	4/26/2022	Total Dissolved Solids	233	mg/L	900	n/a	Y	Y	3.40
CTUA	CTUA-22-239617	5/02/2022	Total Dissolved Solids	221	mg/L	900	n/a	Y	Y	3.40
CTUA	CTUA-22-239618	5/18/2022	Total Dissolved Solids	220	mg/L	900	n/a	Y	Y	3.40
CTUA	CTUA-22-239619	5/24/2022	Total Dissolved Solids	253	mg/L	900	n/a	Y	Y	3.40
CTUA	CrTMT-22-252146	6/02/2022	Total Dissolved Solids	226	mg/L	900	n/a	Y	Y	3.40
CTUA	CrTMT-22-252147	6/07/2022	Total Dissolved Solids	229	mg/L	900	n/a	Y	Y	3.40
CTUA	CrTMT-22-252148	6/14/2022	Total Dissolved Solids	224	mg/L	900	n/a	Y	Y	3.40

Table 2.2-1 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CrTMT-22-252149	6/21/2022	Total Dissolved Solids	221	mg/L	900	n/a	Y	Y	3.40
CTUA	CrTMT-22-252150	6/28/2022	Total Dissolved Solids	219	mg/L	900	n/a	Y	Y	3.40
CTUC	CTUC-22-239629	4/04/2022	Total Dissolved Solids	237	mg/L	900	n/a	Y	Y	3.40
CTUC	CTUC-22-239630	4/13/2022	Total Dissolved Solids	280	mg/L	900	n/a	Y	Y	3.40
CTUC	CTUC-22-239631	4/19/2022	Total Dissolved Solids	239	mg/L	900	n/a	Y	Y	3.40
CTUC	CTUC-22-239632	4/26/2022	Total Dissolved Solids	236	mg/L	900	n/a	Y	Y	3.40
CTUC	CTUC-22-239633	5/02/2022	Total Dissolved Solids	221	mg/L	900	n/a	Y	Y	3.40
CTUC	CTUC-22-239634	5/18/2022	Total Dissolved Solids	237	mg/L	900	n/a	Y	Y	3.40
CTUC	CTUC-22-239635	5/24/2022	Total Dissolved Solids	236	mg/L	900	n/a	Y	Y	3.40
CTUC	CrTMT-22-252128	6/02/2022	Total Dissolved Solids	236	mg/L	900	n/a	Y	Y	3.40
CTUC	CrTMT-22-252129	6/07/2022	Total Dissolved Solids	223	mg/L	900	n/a	Y	Y	3.40
CTUC	CrTMT-22-252130	6/14/2022	Total Dissolved Solids	200	mg/L	900	n/a	Y	Y	3.40
CTUC	CrTMT-22-252131	6/21/2022	Total Dissolved Solids	223	mg/L	900	n/a	Y	Y	3.40
CTUC	CrTMT-22-252132	6/28/2022	Total Dissolved Solids	224	mg/L	900	n/a	Y	Y	3.40

[a] In accordance with Condition No. 13 of DP-1835, analysis of the treated effluent from each IX unit is required only once every month for the CY 2022 Quarter 2 reporting period.

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

[c] In the Detect Flag column, Y = detected.

[d] In the Filtered column, Y = filtered.

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

[f] N = No (not detected).

[g] J = Analyte is classified as estimated.

The pilot-scale molasses and sodium dithionite amendment studies began with NMED conditional approvals during CY 2017 Quarter 4 (NMED 2017a, NMED 2017b), and continued during CY 2022 Quarter 2. NMED determined that no permit was required for the deployment of these amendments. In accordance with the NMED conditional approvals, iron, manganese, and arsenic sampling in the treated water from extraction wells was completed, and the results were submitted in the quarterly monitoring reports under DP-1835. These results for CY 2022 Quarter 2 are provided in Table 2.2-2. No results for iron, manganese, or arsenic exceeded 90% of the numeric standards (900 µg/L, 180 µg/L, and 9 µg/L, respectively) as specified in 20.6.2.3103 NMAC.

DP-1835 Permit Condition No. 13 requires treated effluent to be analyzed annually for all water contaminants listed in 20.6.2.3103 NMAC and all toxic pollutants defined in 20.6.2.7.T(2) NMAC. The annual sample for CY 2022 is scheduled to be obtained during CY 2022 Quarter 3.

2.3 Quarterly Depth to Groundwater and Groundwater Quality Sampling Results (Requirement 3)

Depth to groundwater is expressed as the elevation of the groundwater above sea level. Figure 2.3-1 is the groundwater elevation map, and Table 2.3-1 provides the quarterly groundwater elevation measurements for a non-exhaustive selection of wells. An explanation of how the groundwater elevation map was generated is provided below. Quarterly groundwater analytical results from samples collected during CY 2022 Quarter 2 for the monitoring wells listed in Condition No. 14 are summarized in Table 2.3-2. Note that some analytes reported in this table exceed their corresponding groundwater standard or screening level.

Sample results for total chromium, nitrate, perchlorate, sulfate, fluoride, chloride, or total dissolved solids are compared with numeric standards of 20.6.2.3103 NMAC or, for constituents not listed in 20.6.2.3103 NMAC, the numeric screening levels established for tap water in Table A-1 of the 2022 NMED "Risk Assessment Guidance for Site Investigations and Remediation Volume 1, Soil Screening Guidance for Human Health Risk Assessments" (NMED 2022). The values for these seven analytes are as follows:

- Chloride 250 mg/L
- Perchlorate 13.8 µg/L
- Chromium 50 µg/L
- Fluoride 1.6 mg/L
- Nitrate 10 mg/L
- Sulfate 600 mg/L
- Total dissolved solids 1000 mg/L

The regional aquifer beneath the Pajarito Plateau, on which Los Alamos National Laboratory (LANL or the Laboratory) is situated, is a complex hydrogeological system. The shape of the regional water table is predominantly controlled by the areas of recharge to the west (the flanks of the Sierra de los Valles and the Pajarito fault zone) and discharge to the east (the Rio Grande and the White Rock Canyon Springs). At a more local scale, such as the chromium plume area, the structure of the regional water table and groundwater flow is also expected to be influenced by

- local infiltration zones and recharge areas (e.g., beneath canyons),
- heterogeneity and anisotropy in the aquifer properties, and
- extraction and injection locations (municipal water-supply wells and chromium interim measure [IM] extraction/injection wells).

Table 2.2-2
Treated Effluent Analytical Results Summary Table Related to Molasses and Sodium Dithionite Pilot Studies under NMED Conditional Approval – CY 2022 Quarter 2, DP-1835

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239613	4/04/2022	Arsenic	2.00	µg/L	9	U[b]	N[c]	Y[d]	2.00
CTUA	CTUA-22-239614	4/13/2022	Arsenic	3.03	µg/L	9	J[e]	Y[f]	Y	2.00
CTUA	CTUA-22-239615	4/19/2022	Arsenic	2.89	µg/L	9	J	Y	Y	2.00
CTUA	CTUA-22-239616	4/26/2022	Arsenic	3.93	µg/L	9	J	Y	Y	2.00
CTUA	CTUA-22-239617	5/02/2022	Arsenic	2.00	µg/L	9	U	N	Y	2.00
CTUA	CTUA-22-239618	5/18/2022	Arsenic	2.30	µg/L	9	J	Y	Y	2.00
CTUA	CTUA-22-239619	5/24/2022	Arsenic	2.30	µg/L	9	J	Y	Y	2.00
CTUA	CrTMT-22-252146	6/02/2022	Arsenic	8.55	µg/L	9	n/a[g]	Y	Y	2.00
CTUA	CrTMT-22-252147	6/07/2022	Arsenic	2.11	µg/L	9	J	Y	Y	2.00
CTUA	CrTMT-22-252148	6/14/2022	Arsenic	3.21	µg/L	9	J	Y	Y	2.00
CTUA	CrTMT-22-252149	6/21/2022	Arsenic	2.00	µg/L	9	U	N	Y	2.00
CTUA	CrTMT-22-252150	6/28/2022	Arsenic	2.25	µg/L	9	J	Y	Y	2.00
CTUC	CTUC-22-239629	4/04/2022	Arsenic	2.16	µg/L	9	J	Y	Y	2.00
CTUC	CTUC-22-239630	4/13/2022	Arsenic	2.00	µg/L	9	U	N	Y	2.00
CTUC	CTUC-22-239631	4/19/2022	Arsenic	2.85	µg/L	9	J	Y	Y	2.00
CTUC	CTUC-22-239632	4/26/2022	Arsenic	4.20	µg/L	9	J	Y	Y	2.00
CTUC	CTUC-22-239633	5/02/2022	Arsenic	2.00	µg/L	9	U	N	Y	2.00
CTUC	CTUC-22-239634	5/18/2022	Arsenic	2.11	µg/L	9	J	Y	Y	2.00
CTUC	CTUC-22-239635	5/24/2022	Arsenic	2.41	µg/L	9	J	Y	Y	2.00
CTUC	CrTMT-22-252128	6/02/2022	Arsenic	8.28	µg/L	9	n/a	Y	Y	2.00
CTUC	CrTMT-22-252129	6/07/2022	Arsenic	2.00	µg/L	9	U	N	Y	2.00
CTUC	CrTMT-22-252130	6/14/2022	Arsenic	3.45	µg/L	9	J	Y	Y	2.00
CTUC	CrTMT-22-252131	6/21/2022	Arsenic	2.00	µg/L	9	U	N	Y	2.00
CTUC	CrTMT-22-252132	6/28/2022	Arsenic	3.88	µg/L	9	J	Y	Y	2.00
CTUA	CTUA-22-239613	4/04/2022	Iron	30.0	µg/L	900	U	N	Y	30.0

Table 2.2-2 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239614	4/13/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CTUA-22-239615	4/19/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CTUA-22-239616	4/26/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CTUA-22-239617	5/02/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CTUA-22-239618	5/18/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CTUA-22-239619	5/24/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CrTMT-22-252146	6/02/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CrTMT-22-252147	6/07/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CrTMT-22-252148	6/14/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CrTMT-22-252149	6/21/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CrTMT-22-252150	6/28/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CTUC-22-239629	4/04/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CTUC-22-239630	4/13/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CTUC-22-239631	4/19/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CTUC-22-239632	4/26/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CTUC-22-239633	5/02/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CTUC-22-239634	5/18/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CTUC-22-239635	5/24/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CrTMT-22-252128	6/02/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CrTMT-22-252129	6/07/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CrTMT-22-252130	6/14/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CrTMT-22-252131	6/21/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUC	CrTMT-22-252132	6/28/2022	Iron	30.0	µg/L	900	U	N	Y	30.0
CTUA	CTUA-22-239613	4/04/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CTUA-22-239614	4/13/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CTUA-22-239615	4/19/2022	Manganese	2.00	µg/L	180	U	N	Y	2

Table 2.2-2 (continued)

Location ID	Sample ID	Sample Date[a]	Parameter Name	Result	Report Unit	90% of Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CTUA	CTUA-22-239616	4/26/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CTUA-22-239617	5/02/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CTUA-22-239618	5/18/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CTUA-22-239619	5/24/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CrTMT-22-252146	6/02/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CrTMT-22-252147	6/07/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CrTMT-22-252148	6/14/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CrTMT-22-252149	6/21/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUA	CrTMT-22-252150	6/28/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CTUC-22-239629	4/04/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CTUC-22-239630	4/13/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CTUC-22-239631	4/19/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CTUC-22-239634	5/18/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CTUC-22-239635	5/24/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CrTMT-22-252128	6/02/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CrTMT-22-252129	6/07/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CrTMT-22-252130	6/14/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CrTMT-22-252131	6/21/2022	Manganese	2.00	µg/L	180	U	N	Y	2
CTUC	CrTMT-22-252132	6/28/2022	Manganese	2.00	µg/L	180	U	N	Y	2

[a] In accordance with Condition No. 13 of DP-1835, analysis of the treated effluent from each IX unit is required only once every month for the CY 2022 Quarter 2 reporting period.

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

[c] N = No (not detected).

[d] In the Filtered column, Y= filtered.

[e] J = Analyte is classified as estimated.

[f] In the Detect Flag column, Y = detected.

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

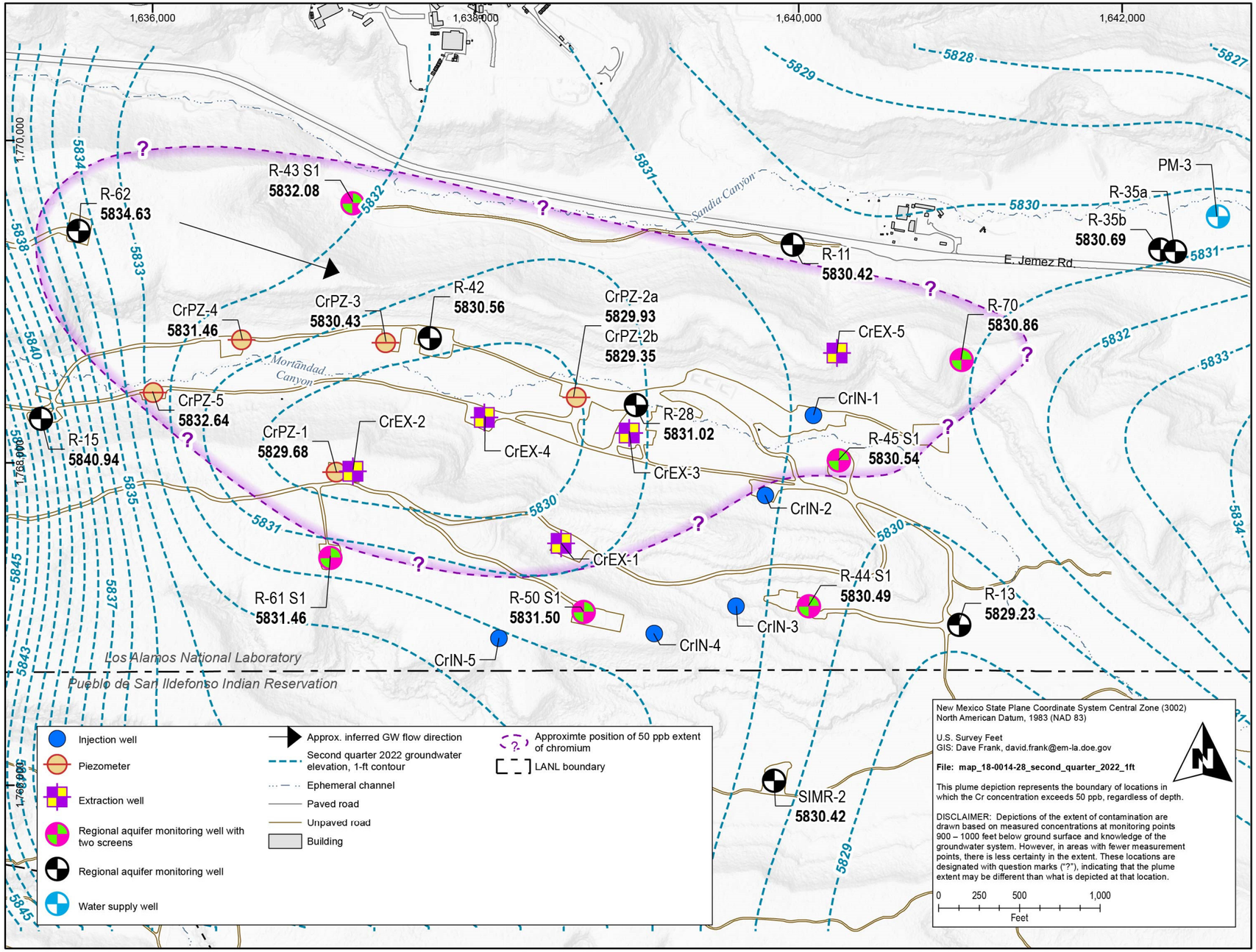

Figure 2.3-1 Groundwater elevation contour map – CY 2022 Quarter 2, DP-1835

Table 2.3-1
Groundwater Elevations Summary for
Groundwater Monitoring Wells – CY 2022 Quarter 2, DP-1835

Monitoring Well	Groundwater Elevation[a] (ft)
CrPZ-1 (CrCH-1)	5829.68
CrPZ-2a (CrCH-2a)	5829.93
CrPZ-2b (CrCH-2b)	5829.35
CrPZ-3 (CrCH-3)	5830.43
CrPZ-4 (CrCH-4)	5831.46
CrPZ-5 (CrCH-5)	5832.64
R-11	5830.42
R-13	5829.23
R-43 S1[b]	5832.08
R-43 S2[c]	5831.58
R-44 S1	5830.49
R-44 S2	5830.05
R-45 S1	5830.54
R-45 S2	5829.89
R-50 S1	5831.50
R-50 S2	5830.38
R-61 S1	5831.46
R-61 S2	5831.36
R-62	5834.63
SIMR-2[d]	5830.42

[a] Groundwater elevations provided are based on average April 2022 values from transducers.

[b] S1 = Screen 1.

[c] S2 = Screen 2.

[d] SIMR-2 data are reported here in accordance with the memorandum of agreement and protocol agreement between San Ildefonso Pueblo and DOE.

Table 2.3-2
Groundwater Monitoring Wells Analytical Results Summary Table – CY 2022 Quarter 2, DP-1835

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CASA-22-248659	R-11	4/15/2022	Chloride	3.90	mg/L	250	No	n/a[a]	Y[b]	Y[c]	0.200
CASA-22-248659	R-11	4/15/2022	Perchlorate	0.729	µg/L	13.8	No	n/a	Y	Y	0.200
CASA-22-248659	R-11	4/15/2022	Chromium	13.3	µg/L	50	No	n/a	Y	Y	10.0
CASA-22-248659	R-11	4/15/2022	Fluoride	0.479	mg/L	1.6	No	n/a	Y	Y	0.100
CASA-22-248659	R-11	4/15/2022	Nitrate-Nitrite as Nitrogen	5.75	mg/L	10	No	n/a	Y	Y	0.500
CASA-22-248659	R-11	4/15/2022	Sulfate	9.27	mg/L	600	No	n/a	Y	Y	0.400
CASA-22-248659	R-11	4/15/2022	Total Dissolved Solids	206	mg/L	1000	No	n/a	Y	Y	14.3
CASA-22-249385	R-11	5/03/2022	Chloride	3.91	mg/L	250	No	n/a	Y	Y	0.200
CASA-22-249385	R-11	5/03/2022	Perchlorate	0.846	µg/L	13.8	No	n/a	Y	Y	0.200
CASA-22-249385	R-11	5/03/2022	Chromium	14.0	µg/L	50	No	n/a	Y	Y	10.0
CASA-22-249385	R-11	5/03/2022	Fluoride	0.530	mg/L	1.6	No	n/a	Y	Y	0.100
CASA-22-249385	R-11	5/03/2022	Nitrate-Nitrite as Nitrogen	5.38	mg/L	10	No	n/a	Y	Y	0.500
CASA-22-249385	R-11	5/03/2022	Sulfate	9.39	mg/L	600	No	n/a	Y	Y	0.400
CASA-22-249385	R-11	5/03/2022	Total Dissolved Solids	171	mg/L	1000	No	n/a	Y	Y	14.3
CASA-22-250666	R-11	6/08/2022	Chloride	3.61	mg/L	250	No	n/a	Y	Y	0.200
CASA-22-250666	R-11	6/08/2022	Perchlorate	0.788	µg/L	13.8	No	n/a	Y	Y	0.200
CASA-22-250666	R-11	6/08/2022	Chromium	12.9	µg/L	50	No	n/a	Y	Y	10.0
CASA-22-250666	R-11	6/08/2022	Fluoride	0.593	mg/L	1.6	No	n/a	Y	Y	0.100
CASA-22-250666	R-11	6/08/2022	Nitrate-Nitrite as Nitrogen	6.20	mg/L	10	No	n/a	Y	Y	0.500
CASA-22-250666	R-11	6/08/2022	Sulfate	9.34	mg/L	600	No	n/a	Y	Y	0.400
CASA-22-250666	R-11	6/08/2022	Total Dissolved Solids	194	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-249310	R-13	5/31/2022	Chloride	3.09	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-249310	R-13	5/31/2022	Perchlorate	0.410	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249310	R-13	5/31/2022	Chromium	4.59	µg/L	50	No	J[d]	Y	Y	10.0
CAMO-22-249310	R-13	5/31/2022	Fluoride	0.412	mg/L	1.6	No	n/a	Y	Y	0.100

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-22-249310	R-13	5/31/2022	Nitrate-Nitrite as Nitrogen	0.841	mg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-249310	R-13	5/31/2022	Sulfate	3.70	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-249310	R-13	5/31/2022	Total Dissolved Solids	120	mg/L	1000	No	n/a	Y	Y	14.3
CASA-22-249398	R-43 S1[e]	5/24/2022	Chloride	7.73	mg/L	250	No	n/a	Y	Y	0.200
CASA-22-249398	R-43 S1	5/24/2022	Perchlorate	0.754	µg/L	13.8	No	n/a	Y	Y	0.200
CASA-22-249398	R-43 S1	5/24/2022	Chromium	188	µg/L	50	Yes	n/a	Y	Y	10.0
CASA-22-249398	R-43 S1	5/24/2022	Fluoride	0.402	mg/L	1.6	No	n/a	Y	Y	0.100
CASA-22-249398	R-43 S1	5/24/2022	Nitrate-Nitrite as Nitrogen	5.14	mg/L	10	No	n/a	Y	Y	0.500
CASA-22-249398	R-43 S1	5/24/2022	Sulfate	16.0	mg/L	600	No	n/a	Y	Y	0.400
CASA-22-249398	R-43 S1	5/24/2022	Total Dissolved Solids	201	mg/L	1000	No	n/a	Y	Y	14.3
CASA-22-249400	R-43 S2[f]	5/03/2022	Chloride	7.24	mg/L	250	No	n/a	Y	Y	0.200
CASA-22-249400	R-43 S2	5/03/2022	Perchlorate	0.952	µg/L	13.8	No	n/a	Y	Y	0.200
CASA-22-249400	R-43 S2	5/03/2022	Chromium	38.2	µg/L	50	No	n/a	Y	Y	10.0
CASA-22-249400	R-43 S2	5/03/2022	Fluoride	0.432	mg/L	1.6	No	n/a	Y	Y	0.100
CASA-22-249400	R-43 S2	5/03/2022	Nitrate-Nitrite as Nitrogen	4.15	mg/L	10	No	n/a	Y	Y	0.500
CASA-22-249400	R-43 S2	5/03/2022	Sulfate	10.7	mg/L	600	No	n/a	Y	Y	0.400
CASA-22-249400	R-43 S2	5/03/2022	Total Dissolved Solids	139	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-248672	R-44 S1	4/14/2022	Chloride	20.5	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-248672	R-44 S1	4/14/2022	Perchlorate	0.396	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-248672	R-44 S1	4/14/2022	Chromium	3.06	mg/L	50	No	J	Y	Y	10.0
CAMO-22-248672	R-44 S1	4/14/2022	Fluoride	0.192	µg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-248672	R-44 S1	4/14/2022	Nitrate-Nitrite as Nitrogen	2.79	mg/L	10	No	n/a	Y	Y	0.250
CAMO-22-248672	R-44 S1	4/14/2022	Sulfate	20.1	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-248672	R-44 S1	4/14/2022	Total Dissolved Solids	216	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-249319	R-44 S1	5/26/2022	Chloride	19.8	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-249319	R-44 S1	5/26/2022	Perchlorate	0.391	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249319	R-44 S1	5/26/2022	Chromium	3.13	µg/L	50	No	J	Y	Y	10.0

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-22-249319	R-44 S1	5/26/2022	Fluoride	0.371	µg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-249319	R-44 S1	5/26/2022	Nitrate-Nitrite as Nitrogen	2.80	mg/L	10	No	n/a	Y	Y	0.250
CAMO-22-249319	R-44 S1	5/26/2022	Sulfate	19.6	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-249319	R-44 S1	5/26/2022	Total Dissolved Solids	197	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-250679	R-44 S1	6/01/2022	Chloride	21.6	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-250679	R-44 S1	6/01/2022	Perchlorate	0.427	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-250679	R-44 S1	6/01/2022	Chromium	3.05	µg/L	50	No	J	Y	Y	10.0
CAMO-22-250679	R-44 S1	6/01/2022	Fluoride	0.285	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-250679	R-44 S1	6/01/2022	Nitrate-Nitrite as Nitrogen	2.87	µg/L	10	No	n/a	Y	Y	0.500
CAMO-22-250679	R-44 S1	6/01/2022	Sulfate	20.7	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-250679	R-44 S1	6/01/2022	Total Dissolved Solids	219	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-248675	R-44 S2	4/14/2022	Chloride	2.54	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-248675	R-44 S2	4/14/2022	Perchlorate	0.329	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-248675	R-44 S2	4/14/2022	Chromium	8.77	µg/L	50	No	J	Y	Y	10.0
CAMO-22-248675	R-44 S2	4/14/2022	Fluoride	0.437	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-248675	R-44 S2	4/14/2022	Nitrate-Nitrite as Nitrogen	0.890	µg/L	10	No	n/a	Y	Y	0.250
CAMO-22-248675	R-44 S2	4/14/2022	Sulfate	2.93	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-248675	R-44 S2	4/14/2022	Total Dissolved Solids	151	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-249323	R-44 S2	5/26/2022	Chloride	2.49	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-249323	R-44 S2	5/26/2022	Perchlorate	0.349	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249323	R-44 S2	5/26/2022	Chromium	9.21	mg/L	50	No	J	Y	Y	10.0
CAMO-22-249323	R-44 S2	5/26/2022	Fluoride	0.535	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-249323	R-44 S2	5/26/2022	Nitrate-Nitrite as Nitrogen	0.874	µg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-249323	R-44 S2	5/26/2022	Sulfate	2.94	µg/L	600	No	n/a	Y	Y	0.400
CAMO-22-249323	R-44 S2	5/26/2022	Total Dissolved Solids	120	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-250682	R-44 S2	6/01/2022	Chloride	2.65	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-250682	R-44 S2	6/01/2022	Perchlorate	0.353	µg/L	13.8	No	n/a	Y	Y	0.200

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-22-250682	R-44 S2	6/01/2022	Chromium	9.45	mg/L	50	No	J	Y	Y	10.0
CAMO-22-250682	R-44 S2	6/01/2022	Fluoride	0.469	µg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-250682	R-44 S2	6/01/2022	Nitrate-Nitrite as Nitrogen	0.898	mg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-250682	R-44 S2	6/01/2022	Sulfate	3.01	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-250682	R-44 S2	6/01/2022	Total Dissolved Solids	140	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-248679	R-45 S1	4/07/2022	Chloride	19.7	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-248679	R-45 S1	4/07/2022	Perchlorate	0.513	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-248679	R-45 S1	4/07/2022	Chromium	3.45	µg/L	50	No	J	Y	Y	10.0
CAMO-22-248679	R-45 S1	4/07/2022	Fluoride	0.243	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-248679	R-45 S1	4/07/2022	Nitrate-Nitrite as Nitrogen	3.03	mg/L	10	No	n/a	Y	Y	0.500
CAMO-22-248679	R-45 S1	4/07/2022	Sulfate	19.8	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-248679	R-45 S1	4/07/2022	Total Dissolved Solids	220	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-249326	R-45 S1	5/05/2022	Chloride	21.1	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-249326	R-45 S1	5/05/2022	Perchlorate	0.498	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249326	R-45 S1	5/05/2022	Chromium	3.13	mg/L	50	No	J	Y	Y	10.0
CAMO-22-249326	R-45 S1	5/05/2022	Fluoride	0.333	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-249326	R-45 S1	5/05/2022	Nitrate-Nitrite as Nitrogen	3.09	µg/L	10	No	n/a	Y	Y	0.500
CAMO-22-249326	R-45 S1	5/05/2022	Sulfate	20.9	µg/L	600	No	n/a	Y	Y	2.00
CAMO-22-249326	R-45 S1	5/05/2022	Total Dissolved Solids	243	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-250685	R-45 S1	6/15/2022	Chloride	20.5	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-250685	R-45 S1	6/15/2022	Perchlorate	0.472	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-250685	R-45 S1	6/15/2022	Chromium	3.17	µg/L	50	No	J	Y	Y	10.0
CAMO-22-250685	R-45 S1	6/15/2022	Fluoride	0.320	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-250685	R-45 S1	6/15/2022	Nitrate-Nitrite as Nitrogen	2.74	mg/L	10	No	n/a	Y	Y	0.250
CAMO-22-250685	R-45 S1	6/15/2022	Sulfate	20.6	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-250685	R-45 S1	6/15/2022	Total Dissolved Solids	217	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-248682	R-45 S2	4/07/2022	Chloride	7.60	mg/L	250	No	n/a	Y	Y	0.200

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-22-248682	R-45 S2	4/07/2022	Perchlorate	0.504	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-248682	R-45 S2	4/07/2022	Chromium	60.1	µg/L	50	Yes	n/a	Y	Y	10.0
CAMO-22-248682	R-45 S2	4/07/2022	Fluoride	0.320	µg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-248682	R-45 S2	4/07/2022	Nitrate-Nitrite as Nitrogen	1.45	mg/L	10	No	n/a	Y	Y	0.250
CAMO-22-248682	R-45 S2	4/07/2022	Sulfate	9.21	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-248682	R-45 S2	4/07/2022	Total Dissolved Solids	176	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-249329	R-45 S2	5/05/2022	Chloride	7.82	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-249329	R-45 S2	5/05/2022	Perchlorate	0.511	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249329	R-45 S2	5/05/2022	Chromium	62.8	µg/L	50	Yes	n/a	Y	Y	10.0
CAMO-22-249329	R-45 S2	5/05/2022	Fluoride	0.424	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-249329	R-45 S2	5/05/2022	Nitrate-Nitrite as Nitrogen	1.54	mg/L	10	No	n/a	Y	Y	0.250
CAMO-22-249329	R-45 S2	5/05/2022	Sulfate	9.44	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-249329	R-45 S2	5/05/2022	Total Dissolved Solids	193	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-250688	R-45 S2	6/15/2022	Chloride	7.85	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-250688	R-45 S2	6/15/2022	Perchlorate	0.499	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-250688	R-45 S2	6/15/2022	Chromium	65.2	µg/L	50	Yes	n/a	Y	Y	10.0
CAMO-22-250688	R-45 S2	6/15/2022	Fluoride	0.474	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-250688	R-45 S2	6/15/2022	Nitrate-Nitrite as Nitrogen	1.36	mg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-250688	R-45 S2	6/15/2022	Sulfate	9.89	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-250688	R-45 S2	6/15/2022	Total Dissolved Solids	176	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-248685	R-50 S1	4/20/2022	Chloride	21.7	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-248685	R-50 S1	4/20/2022	Perchlorate	0.418	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-248685	R-50 S1	4/20/2022	Chromium	9.50	µg/L	50	No	J	Y	Y	10.0
CAMO-22-248685	R-50 S1	4/20/2022	Fluoride	0.355	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-248685	R-50 S1	4/20/2022	Nitrate-Nitrite as Nitrogen	3.04	mg/L	10	No	n/a	Y	Y	0.500
CAMO-22-248685	R-50 S1	4/20/2022	Sulfate	21.1	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-248685	R-50 S1	4/20/2022	Total Dissolved Solids	237	mg/L	1000	No	n/a	Y	Y	14.3

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-22-249332	R-50 S1	5/20/2022	Chloride	22.4	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-249332	R-50 S1	5/20/2022	Perchlorate	0.430	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249332	R-50 S1	5/20/2022	Chromium	11.6	µg/L	50	No	n/a	Y	Y	10.0
CAMO-22-249332	R-50 S1	5/20/2022	Fluoride	0.281	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-249332	R-50 S1	5/20/2022	Nitrate-Nitrite as Nitrogen	2.99	mg/L	10	No	n/a	Y	Y	0.500
CAMO-22-249332	R-50 S1	5/20/2022	Sulfate	21.0	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-249332	R-50 S1	5/20/2022	Total Dissolved Solids	233	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-250691	R-50 S1	6/02/2022	Chloride	21.3	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-250691	R-50 S1	6/02/2022	Perchlorate	0.420	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-250691	R-50 S1	6/02/2022	Chromium	9.95	mg/L	50	No	J	Y	Y	10.0
CAMO-22-250691	R-50 S1	6/02/2022	Fluoride	0.217	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-250691	R-50 S1	6/02/2022	Nitrate-Nitrite as Nitrogen	3.02	µg/L	10	No	n/a	Y	Y	0.500
CAMO-22-250691	R-50 S1	6/02/2022	Sulfate	21.1	µg/L	600	No	n/a	Y	Y	2.00
CAMO-22-250691	R-50 S1	6/02/2022	Total Dissolved Solids	223	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-248688	R-50 S2	4/19/2022	Chloride	2.19	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-248688	R-50 S2	4/19/2022	Perchlorate	0.339	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-248688	R-50 S2	4/19/2022	Chromium	4.74	µg/L	50	No	J	Y	Y	10.0
CAMO-22-248688	R-50 S2	4/19/2022	Fluoride	0.460	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-248688	R-50 S2	4/19/2022	Nitrate-Nitrite as Nitrogen	0.585	mg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-248688	R-50 S2	4/19/2022	Sulfate	2.58	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-248688	R-50 S2	4/19/2022	Total Dissolved Solids	163	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-249335	R-50 S2	5/23/2022	Chloride	2.18	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-249335	R-50 S2	5/23/2022	Perchlorate	0.331	mg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249335	R-50 S2	5/23/2022	Chromium	4.17	mg/L	50	No	J	Y	Y	10.0
CAMO-22-249335	R-50 S2	5/23/2022	Fluoride	0.584	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-249335	R-50 S2	5/23/2022	Nitrate-Nitrite as Nitrogen	0.610	µg/L	10	No	n/a	Y	Y	0.250
CAMO-22-249335	R-50 S2	5/23/2022	Sulfate	2.53	µg/L	600	No	n/a	Y	Y	0.400

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-22-249335	R-50 S2	5/23/2022	Total Dissolved Solids	147	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-250694	R-50 S2	6/02/2022	Chloride	2.16	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-250694	R-50 S2	6/02/2022	Perchlorate	0.334	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-250694	R-50 S2	6/02/2022	Chromium	4.16	µg/L	50	No	J	Y	Y	10.0
CAMO-22-250694	R-50 S2	6/02/2022	Fluoride	0.403	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-250694	R-50 S2	6/02/2022	Nitrate-Nitrite as Nitrogen	0.605	mg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-250694	R-50 S2	6/02/2022	Sulfate	2.62	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-250694	R-50 S2	6/02/2022	Total Dissolved Solids	140	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-249377	R-62	5/19/2022	Chloride	17.6	mg/L	250	No	n/a	Y	Y	1.00
CAMO-22-249377	R-62	5/19/2022	Perchlorate	0.915	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-249377	R-62	5/19/2022	Chromium	325	µg/L	50	Yes	n/a	Y	Y	10.0
CAMO-22-249377	R-62	5/19/2022	Fluoride	0.267	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-249377	R-62	5/19/2022	Nitrate-Nitrite as Nitrogen	2.10	mg/L	10	No	n/a	Y	Y	0.500
CAMO-22-249377	R-62	5/19/2022	Sulfate	29.8	mg/L	600	No	n/a	Y	Y	2.00
CAMO-22-249377	R-62	5/19/2022	Total Dissolved Solids	227	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-238657	SIMR-2[g]	1/11/2022	Chloride	2.12	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-238657	SIMR-2	1/11/2022	Perchlorate	0.533	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-238657	SIMR-2	1/11/2022	Chromium	5.15	µg/L	50	No	J	Y	Y	10.0
CAMO-22-238657	SIMR-2	1/11/2022	Fluoride	0.305	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-238657	SIMR-2	1/11/2022	Nitrate-Nitrite as Nitrogen	0.790	mg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-238657	SIMR-2	1/11/2022	Sulfate	2.66	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-238657	SIMR-2	1/11/2022	Total Dissolved Solids	133	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-239840	SIMR-2	2/09/2022	Chloride	2.26	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-239840	SIMR-2	2/09/2022	Perchlorate	0.507	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-239840	SIMR-2	2/09/2022	Chromium	4.91	µg/L	50	No	J	Y	Y	10.0
CAMO-22-239840	SIMR-2	2/09/2022	Fluoride	0.387	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-239840	SIMR-2	2/09/2022	Nitrate-Nitrite as Nitrogen	0.770	mg/L	10	No	n/a	Y	Y	0.0500

Table 2.3-2 (continued)

Field Sample ID	Location ID	Sample Date	Parameter Name	Report Result	Report Unit	Standard or Screening Level	Exceeds Standard or Screening Level	Lab Qualifier	Detect Flag	Filtered	Method Detection Limit
CAMO-22-239840	SIMR-2	2/09/2022	Sulfate	2.84	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-239840	SIMR-2	2/09/2022	Total Dissolved Solids	170	mg/L	1000	No	n/a	Y	Y	14.3
CAMO-22-243552	SIMR-2	3/09/2022	Chloride	2.23	mg/L	250	No	n/a	Y	Y	0.200
CAMO-22-243552	SIMR-2	3/09/2022	Perchlorate	0.518	µg/L	13.8	No	n/a	Y	Y	0.200
CAMO-22-243552	SIMR-2	3/09/2022	Chromium	5.40	µg/L	50	No	J	Y	Y	10.0
CAMO-22-243552	SIMR-2	3/09/2022	Fluoride	0.278	mg/L	1.6	No	n/a	Y	Y	0.100
CAMO-22-243552	SIMR-2	3/09/2022	Nitrate-Nitrite as Nitrogen	0.781	mg/L	10	No	n/a	Y	Y	0.0500
CAMO-22-243552	SIMR-2	3/09/2022	Sulfate	2.77	mg/L	600	No	n/a	Y	Y	0.400
CAMO-22-243552	SIMR-2	3/09/2022	Total Dissolved Solids	140	mg/L	1000	No	n/a	Y	Y	14.3

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

[b] In the Detect Flag column, Y = detected.

[c] In the Filtered column, Y = filtered.

[d] J = Analyte is classified as estimated.

[e] S1 = Screen 1.

[f] S2 = Screen 2.

[g] SIMR-2 data are reported here in accordance with the memorandum of agreement and protocol agreement between San Ildefonso Pueblo and DOE.

Long-term water-level data, contaminant transport observations (travel times and direction of migration), and calibrated model results are lines of evidence that suggest that the water table was relatively flat in the area of the chromium plume before the implementation of CrEX extraction and CrIN injection wells. Steeper gradients are found to the west because of the mountain-front recharge and to the east toward the Rio Grande. The low ambient gradient in the chromium plume area could be related to any or all of the following:

- the relatively high permeability of the Puye Formation and Miocene pumiceous sediments
- anisotropy of the regional aquifer
- localized recharge along the canyons above the regional aquifer, faults, or other lineaments that affect regional-scale hydraulic conductivity
- nearby water-supply pumping

Although it is difficult to infer absolute groundwater flow directions from the relatively flat contours in the chromium plume area, the general flow of groundwater can be determined. Groundwater elevation data and contaminant transport observations indicated that before operation of the IM, the groundwater flowed generally toward the east-southeast. The current groundwater flows generally towards the southeast, with the influence of IM operations being seen mainly in the vicinity of the extraction wells CrEX-1, CrEX-2, CrEX-3, and CrEX-4. Local flow direction near these wells is inward because of the extraction-induced depression in potentiometric surface.

Water table elevations in the chromium plume area can vary temporally as a result of transient effects that include injection into, and extraction from, the chromium IM infrastructure wells, and pumping of Los Alamos County's water-supply wells. This is discussed for the case of CY 2022 Quarter 2 below.

Effects on flow direction from water-supply pumping are small compared with the local effects of extraction and injection at chromium IM wells. Transience in the water levels at time scales of hours to days observed at the monitoring wells within the plume area does not appear to be substantially affected by the water-supply pumping at the nearby production wells (PM-2, PM-3, PM-4, PM-5, and O-4) (LANL 2009). Impacts of production well pumping are observed over seasonal to yearly time scales and overall have led to a fairly uniform decline in the water table across the plume area, in contrast to IM extraction and injection impacts.

A long-term decline of approximately 0.2 to 0.5 ft/yr in the regional water levels has been observed throughout the aquifer beneath the Pajarito Plateau. The decline could be caused by long-term changes in the aquifer recharge and discharge conditions. Because of the long-term declines and pumping transience described above, the water-level data and the respective water table contour maps are variable over time; each map therefore represents a specific period of time. Figure 2.3-1 depicts the average water-level data and water table contours for April 2022. General flow direction is indicated by the vector.

To generate this quarterly contour map, average water levels are calculated with a default of using values from the middle month of the 3-month reporting period. In quarters where the middle month may not be representative, e.g., due to an IM well pumping hiatus, water-level values from times other than the middle month are selected. Monitoring wells within and surrounding the plume are used, including wells not presented on the map (e.g., R-21, R-31, R-32, R-37, and R-40) or in Table 2.3-1. Water levels in wells surrounding the plume provide useful control points for contouring along the edges of the area of interest for this report.

Simple interpolation methods for water table data from a complex heterogeneous site could produce maps that do not represent physically realistic hydrological systems. This water table map is contoured by incorporating process knowledge of groundwater hydraulics (e.g., flownet conformity rules) as well as conceptual models of groundwater flow in the project area as described above. Key inputs to the conceptual model include knowledge of long-term operations of extraction and injection wells, water-level elevations in monitoring wells near extraction and injection points, and cross-hole tracer data between injection wells and monitoring wells.

In 2018 and 2019, water table maps for DP-1835 were generated using an interpolation method called Thin-Plate Spline (TPS) (e.g., Friedman 1991 [https://www.jstor.org/stable/2241837]). TPS is a special case of universal kriging. In 2020, an interpolation method called Bayesian Canonical Correlation Regression (BCCR) (Carson 2020) was implemented. BCCR increased efficiency of map-making by using prior knowledge of water levels to generate an initial water table map of the expected surface given quarterly water levels. Kriging was then used to update the map using residuals between the water levels and the expected surface for a given quarter. In CY 2022 Quarter 2, the interpolation method used reverted to TPS. This change was made because of the greater representation of TPS in the scientific literature. Maps generated with the two methods are analogous because both methods use kriging-based interpolation; the primary difference between the two methods is the incorporation of prior information as an initial estimate of water levels.

Because of the spatial coverage of wells and piezometers and the regional structure of significantly steeper gradients to the east and west of the chromium plume area, surrounding wells (e.g., R-21, R-31, R-32, R-37, and R-40) and control points based on expert opinion are used to provide estimated water-level elevations in areas that do not have sufficient data to provide constraints (EPA 2008). As additional analysis is performed using historical and developing data sets from existing wells and data that will be collected from proposed wells, the use of these control points is being reanalyzed, adjusted, or discontinued based on additional supporting data and contouring methods.

Over the course of operating the chromium IM system, changes to water table elevation occur depending upon how the system has been operating. A quarter-by-quarter account of the water table elevations is not provided as part of this quarterly report. Each quarterly report previously submitted provides information of the water table elevation near the chromium IM wells along with possible causes for water-level variations for that specific quarter. Information on the quarterly depth to groundwater for CY 2022 Quarter 2 is provided below.

In the current reporting period of CY 2022 Quarter 2, IM pumping was paused from May 9 to May 16. As May is the middle month of Quarter 2, data from May would usually be employed to make the water table map in Figure 2.3-1. However, because of the pumping hiatus in May, April data (presented in Table 2.3-1) were used to generate Figure 2.3-1. Compared with the prior quarter (CY 2022 Quarter 1), water levels increased at R-44, R-45, and R-50 (along the injection front), and decreased at multiple wells in the central region of the map, including CrPZ-1, CrPZ-2a, CrPZ-3, and R-42. The central depression shifted upgradient and the contour surrounding it became closed. The Quarter 1 map was made during a period of IM pumping quiescence, and changes between Quarter 1 and Quarter 2 can be interpreted to gain insight on impacts of IM pumping in the area of the chromium plume.

2.4 Any Operations/Maintenance Activities Performed (Requirement 4)

Extraction, treatment, and injection operations continued during CY 2022 Quarter 2. Operations and maintenance activities completed during CY 2022 Quarter 2 are listed in Table 2.4-1 for the extraction, treatment, and injection system.

Table 2.4-1
Operations and Maintenance Activity Summary Table – CY 2022 Quarter 2

Maintenance Date	Elements Impacted	Operation/Maintenance Description
4/1/2022 through 4/3/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
4/3/2022	CTUA	IX vessel exchanges were completed as follows because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis: • Treatment train A – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. • Treatment train B – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. • Treatment train C – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. Both influent filter bags replaced.
4/3/2022 through 4/7/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
4/7/2022	CTUC CrEX-3, CrIN-3	CTUC Treatment train B turned off because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis. CrEX-3 and CrIN-3 turned off to balance flow.
4/8/2022 through 4/12/2022	CrEX-1, CrEX-2, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
4/12/2022	CTUC CrEX-3, CrIN-3	IX vessel exchanges were completed as follows because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis: • Treatment train A – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. • Treatment train B – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. CrEX-3 and CrIN-3 turned on to balance flow.
4/12/2022 through 4/22/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.

Table 2.4-1 (continued)

Maintenance Date	Elements Impacted	Operation/Maintenance Description
4/22/2022	CrEX-4, CrIN-1	CrEX-4 turned off in preparation for tracer test at R-42. CrIN-1 also turned off to balance flow.
4/22/2022 through 4/28/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-5, CTUA, CTUC, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
4/28/2022	CrEX-4, CrIN-1	CrEX-4 turned on after tracer test at R-42. CrIN-1 also turned on to balance flow.
4/28/2022 through 5/6/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
5/6/2022	CrEX-4, CrIN-1	CrEX-4 turned off to monitor data from tracer test at R-42. CrIN-1 also turned off to balance flow.
5/6/2022 through 5/8/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-5, CTUA, CTUC, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
5/8/2022	CrEX-2, CrIN-3	CrEX-2 turned off because of wellhead air relief valve (ARV) issues. CrIN-3 also turned off to balance flow.
5/9/2022	CrEX-1, CrEX-3, CrEX-5, CTUA, CTUC, CrIN-2, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
5/9/2022 through 5/16/2022	Entire system	Turned off all extraction wells, injection wells, and treatment units because of Cerro Pelado wildfire.
5/17/2022 through 5/19/2022	CrEX-1, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
5/19/2022	CrEX-2, CrIN-3	CrEX-2 turned on after ARV repaired. CrIN-3 also turned on to balance flow.
5/20/2022	Entire system	Turned off all extraction wells, injection wells, and treatment units because of remote access issues.
5/21/2022 through 5/22/2022	CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
5/23/2022	Entire system	System off because of an uninterruptible power supply unit issue at booster station.
5/24/2022	CrEX-1, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.

Table 2.4-1 (continued)

Maintenance Date	Elements Impacted	Operation/Maintenance Description
5/25/2022	CTUA	IX vessel exchanges were completed as follows because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis: • Treatment train A – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. • Treatment train B – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. • Treatment train C – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. Both influent filter bags replaced.
	CTUC	IX vessel exchanges were completed as follows because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis: • Treatment train A – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. • Treatment train B – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. Both influent bags replaced.
5/25/2022 through 6/8/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
6/8/2022	Entire system	Turned off all extraction wells, injection wells, and treatment units to replace uninterruptible power supply unit at the booster station.
6/9/2022 through 6/11/2022	CrEX-1, CrEX-2, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
	CrEX-3, CrIN-3	CrEX-3 turned off because of transmitter issues. CrIN-3 also turned off to balance flow.
6/11/2022 through 6/22/2022	CrEX-1, CrEX-2, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
	CrIN-3	CrIN-3 turned on to balance flow.

Table 2.4-1 (continued)

Maintenance Date	Elements Impacted	Operation/Maintenance Description
6/22/2022	CTUC	IX vessel exchanges were completed as follows because of an increase in the amount of hexavalent chromium at the primary IX vessel effluent as determined via Hach instrument analysis: • Treatment train A – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. • Treatment train B – replaced primary IX vessel with the secondary IX vessel; new secondary IX vessel installed. Both influent bags replaced.
6/23/2022	CrEX-1, CrEX-2, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
6/24/2022	CrEX-3	CrEX-3 turned on after replacement of transmitter.
6/24/2022 through 6/29/2022	CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.
6/29/2022	CrEX-2	CrEX-2 turned off because of power failure.
6/29/2022 through 6/30/2022	CrEX-1, CrEX-3, CrEX-4, CrEX-5, CTUA, CTUC, CrIN-1, CrIN-2, CrIN-3, CrIN-4, CrIN-5	Extraction, treatment, and injection of treated groundwater occurred per operational plan.

2.5 Any Periodic Test of Mechanical Integrity Conducted (Requirement 5)

Periodic testing of mechanical integrity was not conducted or reported to NMED during CY 2022 Quarter 2. Mechanical integrity testing was performed and reported to NMED during the CY 2019 Quarter 2 reporting period. In accordance with Condition No. 3, mechanical integrity testing will occur at least once every 5 yr unless a UIC well is reconfigured. Under this scenario, a mechanical integrity test before reinjection of treated effluent at a specific reconfigured well will be completed pursuant to Condition No. 3.

2.6 Any Replacement of Primary or Secondary IX Vessels or Associated Treatment System Infrastructure (Requirement 6)

New primary and secondary IX vessels were installed at various times for treatment unit CTUA (all three treatment trains) and at CTUC (both treatment trains) during the reporting period, as cited in section 2.4.

2.7 Any Well Workovers Conducted (Requirement 7)

No well workovers were conducted during CY 2022 Quarter 2.

2.8 Any Additional Operational Changes with the Potential to Markedly Affect the Discharge (Requirement 8)

During the reporting period, the pilot-scale molasses amendment and sodium dithionite amendment studies continued. In accordance with NMED's conditional approval of these studies, analytical results

from iron, manganese, and arsenic testing of the treated water from the extraction wells during the study are being provided in the quarterly monitoring reports under DP-1835. These results for CY 2022 Quarter 2 are provided in Table 2.2-2.

No results for arsenic, iron, or manganese exceeded 90% of the numeric standards of 20.6.2.3103 NMAC or 90% of the numeric standards established for tap water in Table A-1 of the 2022 NMED risk assessment guidance (NMED 2022) for constituents not listed in 20.6.2.3103 NMAC. The 90% values for arsenic, iron, and manganese are 9 µg/L, 900 µg/L, and 180 µg/L, respectively.

Other than the activities cited in section 2.4, no additional operational changes occurred during the reporting period.

2.9 Monthly Average, Maximum, and Minimum Values for Flow Rate and Volume of Treated Effluent Transferred to Each UIC Well (Requirement 9)

Table 2.9-1 provides the monthly average, maximum, and minimum values for flow rate and volume of treated effluent transferred to each well in CY 2022 Quarter 2.

Table 2.9-1
Flows and Volumes of Treated Effluent Injected – CY 2022 Quarter 2, DP-1835

Injection Well	Flow rate (gpm[a])			Daily Volume (gal.)			Total Volume (gal.)
	Average[b]	Maximum	Minimum[c]	Average	Maximum	Minimum	
April 2022							
CrIN-1	56.1	64.0	22.3	80,811	92,119	32,085	2,020,281
CrIN-2	59.5	63.9	54.8	85,715	92,006	78,908	2,571,447
CrIN-3	41.1	58.0	19.0	59,141	83,489	27,308	1,537,676
CrIN-4	58.9	62.5	53.4	84,747	90,068	76,917	2,542,407
CrIN-5	58.3	60.9	53.1	83,930	87,660	76,429	2,517,890
May 2022							
CrIN-1	45.7	60.8	0.8	65,840	87,528	1201	1,382,638
CrIN-2	49.3	62.8	1.0	71,046	90,424	1450	1,705,114
CrIN-3	33.0	56.9	0.2	47,582	81,958	257	1,046,798
CrIN-4	48.2	61.7	0.1	69,398	88,844	100	1,596,161
CrIN-5	49.3	65.7	0.1	70,978	94,607	123	1,561,505
June 2022							
CrIN-1	54.8	62.2	29.8	78,956	89,565	42,929	2,368,681
CrIN-2	56.2	65.0	31.9	80,906	93,538	45,996	2,427,175
CrIN-3	32.8	46.2	16.5	47,224	66,586	23,719	1,322,270
CrIN-4	54.7	64.4	32.2	78,801	92,694	46,386	2,364,044
CrIN-5	55.4	63.4	32.8	79,769	91,333	47,180	2,393,082

[a] gpm = Gallons per minute.

[b] Average flow rate and daily volume represent arithmetic mean values of results provided during periods when treated groundwater was being injected.

[c] Minimum values represent the minimum daily value recorded during days when pumping occurred.

2.10 Total Monthly Volume of Treated Effluent Transferred to Each UIC Well (Requirement 10)

Table 2.9-1 provides total monthly volumes of treated effluent transferred to each well. As previously identified, injection occurred at UIC wells CrIN-1 through CrIN-5 during CY 2022 Quarter 2.

2.11 Monthly Average, Maximum, and Minimum Values of Injection Water Level (Pressure Head) Above Static Level for Each UIC Well (Requirement 11)

Table 2.11-1 provides the monthly average, maximum, and minimum values for injection water level above static level for each UIC well.

Table 2.11-1
Water-Level Values Above Static Level by UIC Well – CY 2022 Quarter 2, DP-1835

UIC Well	April 2022			May 2022			June 2022		
	Average* (ft)	Maximum (ft)	Minimum (ft)	Average (ft)	Maximum (ft)	Minimum (ft)	Average (ft)	Maximum (ft)	Minimum (ft)
CrIN-1	7.2	8.1	6.3	6.8	7.7	3.9	6.8	7.7	5.4
CrIN-2	10.3	12.2	5.5	10.3	11.4	7.7	9.8	11.4	7.9
CrIN-3	2.6	3.5	0.8	2.7	3.8	0.8	2.1	3.2	0.0
CrIN-4	13.4	15.5	9.7	13.1	14.7	10.9	14.0	17.5	11.8
CrIN-5	18.9	21.1	6.5	18.6	22.3	4.9	19.1	21.9	5.5

* Average values provided represent arithmetic mean values of maximum daily values during periods when treated groundwater was being injected.

2.12 Daily Volume Injected at Each UIC Well (Requirement 12)

Daily volumes of groundwater injected (following treatment) during CY 2022 Quarter 2 are presented in Table 2.12-1.

Table 2.12-1
Daily Injection Summary Table – CY 2022 Quarter 2, DP-1835

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
4/1/2022	81,980	85,176	54,651	84,876	84,664	391,347
4/2/2022	83,921	81,897	53,812	85,780	84,755	390,165
4/3/2022	85,497	82,526	52,233	76,917	76,429	373,603
4/4/2022	82,851	82,935	56,525	87,861	85,656	395,829
4/5/2022	82,372	82,910	58,996	88,189	84,650	397,117
4/6/2022	83,146	82,915	56,913	88,108	83,514	394,597
4/7/2022	86,364	83,514	33,156	86,459	80,997	370,489
4/8/2022	85,640	83,271	0	82,329	82,102	333,341
4/9/2022	79,805	82,089	0	79,210	82,091	323,195
4/10/2022	77,826	83,752	0	83,654	82,056	327,287
4/11/2022	81,062	83,476	0	85,824	82,971	333,333

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
4/12/2022	80,767	78,908	27,308	84,970	87,660	359,612
4/13/2022	80,654	87,789	61,260	84,347	87,496	401,545
4/14/2022	83,963	85,473	67,529	85,478	85,981	408,424
4/15/2022	86,426	85,551	63,945	85,638	85,153	406,713
4/16/2022	86,341	85,068	61,417	85,342	84,949	403,117
4/17/2022	85,499	85,948	51,320	90,068	85,799	398,634
4/18/2022	85,741	86,293	54,367	87,043	85,710	399,154
4/19/2022	87,111	86,193	50,355	84,500	85,490	393,649
4/20/2022	90,018	84,868	51,826	83,886	84,962	395,560
4/21/2022	92,119	84,831	51,815	83,403	84,713	396,880
4/22/2022	32,085	86,805	63,166	84,318	85,113	351,487
4/23/2022	0	86,435	74,418	83,747	84,505	329,106
4/24/2022	0	91,091	80,794	83,616	85,735	341,236
4/25/2022	0	91,748	83,489	84,402	84,701	344,341
4/26/2022	0	92,006	82,119	84,823	84,457	343,406
4/27/2022	0	91,450	79,154	84,282	82,088	336,974
4/28/2022	51,549	90,439	65,429	84,437	81,853	373,707
4/29/2022	85,868	89,288	50,442	84,678	82,067	392,344
4/30/2022	81,678	86,802	51,238	84,223	79,569	383,509
5/1/2022	80,642	87,212	58,956	84,370	79,608	390,789
5/2/2022	81,518	87,173	61,263	84,529	79,957	394,439
5/3/2022	80,211	90,182	58,645	85,005	81,936	395,979
5/4/2022	83,083	90,424	60,393	84,872	81,916	400,689
5/5/2022	82,673	89,067	66,766	85,299	79,252	403,058
5/6/2022	62,836	89,456	68,383	85,321	79,437	385,433
5/7/2022	0	89,495	81,958	87,162	85,861	344,477
5/8/2022	0	87,887	41,568	88,844	94,607	312,906
5/9/2022	0	30,341	0	30,296	31,232	91,869
5/10/2022	0	0	0	0	0	0
5/11/2022	0	0	0	0	0	0
5/12/2022	0	0	0	0	0	0
5/13/2022	0	0	0	0	0	0
5/14/2022	0	0	0	0	0	0
5/15/2022	0	0	0	0	0	0
5/16/2022	0	0	0	0	0	0
5/17/2022	44,752	45,922	257	48,200	43,839	182,970
5/18/2022	82,223	87,990	0	87,630	82,775	340,619
5/19/2022	78,305	81,348	24,287	81,634	78,978	344,552
5/20/2022	40,275	44,561	34,361	44,341	45,380	208,918

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
5/21/2022	22,739	24,195	19,079	0	0	66,013
5/22/2022	19,725	20,392	17,704	562	123	58,505
5/23/2022	1201	1450	2398	100	0	5149
5/24/2022	48,160	49,266	902	44,495	46,100	188,922
5/25/2022	74,155	77,691	41,509	74,154	72,502	340,011
5/26/2022	76,399	84,406	73,334	86,011	84,512	404,662
5/27/2022	81,896	86,945	76,577	84,526	83,964	413,907
5/28/2022	83,689	89,363	74,172	84,755	84,214	416,194
5/29/2022	87,528	90,170	60,043	84,175	85,061	406,976
5/30/2022	84,188	89,956	60,656	80,275	79,398	394,474
5/31/2022	86,441	90,223	63,588	79,603	80,853	400,707
6/1/2022	84,983	89,724	57,944	79,671	85,016	397,337
6/2/2022	82,153	88,037	58,185	82,290	82,972	393,637
6/3/2022	86,909	89,620	60,142	83,415	82,020	402,106
6/4/2022	86,318	93,538	60,184	83,265	83,485	406,790
6/5/2022	48,251	51,873	29,580	46,808	49,563	226,075
6/6/2022	42,929	45,996	28,182	46,386	47,180	210,673
6/7/2022	59,797	64,159	37,864	62,160	63,204	287,183
6/8/2022	55,035	58,845	35,081	79,767	81,800	310,527
6/9/2022	57,548	57,498	0	61,176	62,493	238,715
6/10/2022	86,304	92,207	0	92,694	91,333	362,539
6/11/2022	88,176	92,487	32,410	87,519	88,038	388,630
6/12/2022	88,972	90,280	51,652	84,924	84,409	400,237
6/13/2022	87,824	87,454	57,200	82,842	85,961	401,281
6/14/2022	88,237	87,391	51,473	83,272	84,941	395,315
6/15/2022	88,967	87,043	57,424	82,459	83,401	399,294
6/16/2022	89,565	86,881	61,969	82,637	84,135	405,187
6/17/2022	79,078	85,491	63,198	86,307	85,600	399,673
6/18/2022	83,546	85,005	61,371	83,852	84,442	398,217
6/19/2022	80,506	84,387	63,902	82,013	84,272	395,080
6/20/2022	87,508	87,653	56,788	82,100	82,771	396,821
6/21/2022	89,261	89,528	44,639	84,260	84,981	392,668
6/22/2022	83,147	80,914	48,758	86,003	84,482	383,304
6/23/2022	86,366	86,155	29,801	82,557	84,971	369,850
6/24/2022	70,622	69,563	31,186	70,237	68,635	310,243
6/25/2022	84,117	80,914	66,586	80,900	83,543	396,059
6/26/2022	82,013	83,687	43,321	79,743	81,039	369,804
6/27/2022	81,515	82,260	42,433	78,259	78,712	363,179

Table 2.12-1 (continued)

Date	CrIN-1 (gal.)	CrIN-2 (gal.)	CrIN-3 (gal.)	CrIN-4 (gal.)	CrIN-5 (gal.)	Total (gal.)
6/28/2022	84,288	84,481	23,719	81,058	86,958	360,503
6/29/2022	80,060	81,677	34,087	82,781	81,689	360,294
6/30/2022	74,686	82,428	33,191	82,689	81,037	354,030
Total 29,357,169						

2.13 Daily Volume Pumped from Each Extraction Well (Requirement 13)

Daily volumes of groundwater pumped from extraction wells during CY 2022 Quarter 2 are presented in Table 2.13-1.

Table 2.13-1
Daily Extraction Summary Table – CY 2022 Quarter 2, DP-1835

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
4/1/2022	107,149	70,832	40,340	78,086	91,512	387,918
4/2/2022	104,126	75,387	40,881	80,673	88,597	389,664
4/3/2022	90,402	72,223	38,993	77,965	90,730	370,314
4/4/2022	101,692	84,462	43,393	76,640	92,017	398,204
4/5/2022	101,973	83,743	42,625	77,254	87,561	393,156
4/6/2022	101,346	81,698	43,110	76,086	89,449	391,690
4/7/2022	99,663	79,078	24,811	77,464	88,979	369,996
4/8/2022	97,291	79,434	0	75,035	80,533	332,293
4/9/2022	96,740	78,700	0	72,028	78,477	325,946
4/10/2022	96,469	78,331	0	73,477	74,901	323,178
4/11/2022	96,535	79,099	0	77,953	75,011	328,597
4/12/2022	96,462	80,859	21,450	73,276	86,261	358,308
4/13/2022	99,698	87,298	41,771	76,751	93,919	399,437
4/14/2022	100,871	88,912	41,200	77,045	95,138	403,167
4/15/2022	100,264	85,004	40,480	79,828	101,836	407,412
4/16/2022	100,793	83,528	40,967	75,190	100,672	401,150
4/17/2022	100,493	83,233	39,829	75,783	99,931	399,269
4/18/2022	99,828	82,749	39,418	78,668	95,262	395,925
4/19/2022	100,503	82,471	38,923	74,121	95,271	391,288
4/20/2022	99,451	82,191	37,821	77,319	94,911	391,694
4/21/2022	99,418	81,790	37,126	80,086	94,227	392,647
4/22/2022	103,516	87,004	39,232	27,587	96,615	353,953
4/23/2022	112,098	91,238	36,457	0	93,819	333,612
4/24/2022	119,479	91,233	31,471	0	95,498	337,682

Table 2.13-1 (continued)

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
4/25/2022	119,457	90,661	34,299	0	99,500	343,917
4/26/2022	118,615	90,069	38,547	0	99,204	346,435
4/27/2022	118,490	90,739	32,457	0	99,446	341,131
4/28/2022	112,136	88,393	28,925	48,751	94,705	372,910
4/29/2022	101,137	87,933	27,491	79,085	95,201	390,848
4/30/2022	93,662	88,847	28,303	77,220	93,408	381,440
5/1/2022	93,916	88,115	36,467	76,016	91,083	385,598
5/2/2022	98,579	87,986	38,995	74,451	91,242	391,254
5/3/2022	100,766	88,919	37,785	77,789	92,148	397,407
5/4/2022	100,822	89,204	40,092	77,750	92,162	400,029
5/5/2022	100,860	87,788	39,973	76,782	92,174	397,577
5/6/2022	103,962	89,960	37,034	55,089	96,531	382,576
5/7/2022	114,175	91,670	26,361	0	112,885	345,091
5/8/2022	116,704	43,678	38,001	0	116,341	314,723
5/9/2022	38,607	0	16,412	0	38,521	93,540
5/10/2022	0	0	0	0	0	0
5/11/2022	0	0	0	0	0	0
5/12/2022	0	0	0	0	0	0
5/13/2022	0	0	0	0	0	0
5/14/2022	0	0	0	0	0	0
5/15/2022	0	0	0	0	0	0
5/16/2022	0	0	0	0	0	0
5/17/2022	52,737	0	29,664	42,893	51,354	176,648
5/18/2022	105,683	0	50,156	82,426	106,413	344,678
5/19/2022	99,164	34,111	39,660	74,715	95,820	343,471
5/20/2022	61,693	52,691	16,381	34,516	39,238	204,519
5/21/2022	0	0	10,719	23,065	30,885	64,670
5/22/2022	0	0	12,289	21,113	26,285	59,687
5/23/2022	0	0	1122	1556	1764	4443
5/24/2022	60,490	0	28,145	45,049	54,702	188,386
5/25/2022	92,511	45,993	38,501	71,643	91,430	340,079
5/26/2022	105,224	88,247	33,739	80,072	102,644	409,925
5/27/2022	108,039	87,552	33,836	78,057	103,861	411,345
5/28/2022	108,066	87,769	34,187	75,958	104,114	410,094
5/29/2022	105,955	88,559	34,338	76,237	101,906	406,994
5/30/2022	97,790	89,797	34,947	76,712	97,608	396,853
5/31/2022	93,486	90,775	34,981	78,784	97,317	395,341
6/1/2022	93,486	90,645	34,147	79,217	97,400	394,895

Table 2.13-1 (continued)

Date	CrEX-1 (gal.)	CrEX-2 (gal.)	CrEX-3 (gal.)	CrEX-4 (gal.)	CrEX-5 (gal.)	Total (gal.)
6/2/2022	93,502	90,578	33,144	79,232	97,562	394,019
6/3/2022	94,892	90,489	33,117	79,031	97,879	395,409
6/4/2022	104,492	88,741	33,054	77,465	100,549	404,301
6/5/2022	58,504	49,074	18,509	43,239	56,498	225,826
6/6/2022	51,315	46,472	19,346	42,330	51,478	210,941
6/7/2022	71,534	65,856	25,377	55,801	70,797	289,364
6/8/2022	62,367	60,792	21,201	68,840	91,356	304,555
6/9/2022	71,981	61,065	0	41,719	65,362	240,126
6/10/2022	114,791	89,359	0	51,819	107,971	363,939
6/11/2022	113,464	89,162	0	70,173	108,474	381,273
6/12/2022	112,327	88,832	0	84,866	109,476	395,500
6/13/2022	112,341	88,384	0	84,966	109,487	395,178
6/14/2022	112,354	88,339	0	84,867	109,527	395,086
6/15/2022	112,341	88,239	0	84,200	111,237	396,017
6/16/2022	112,297	87,791	0	83,594	114,666	398,348
6/17/2022	112,175	87,814	0	83,513	119,416	402,919
6/18/2022	112,048	87,101	0	79,686	114,073	392,908
6/19/2022	113,263	88,847	0	79,389	110,093	391,592
6/20/2022	113,074	88,717	0	81,819	109,768	393,379
6/21/2022	112,906	88,414	0	81,089	108,639	391,049
6/22/2022	108,444	80,213	0	81,570	108,112	378,339
6/23/2022	114,289	55,365	0	87,906	112,943	370,503
6/24/2022	94,121	101,517	20,670	67,933	89,057	373,298
6/25/2022	100,656	89,545	40,160	72,772	87,086	390,219
6/26/2022	105,192	41,674	46,255	77,760	99,841	370,722
6/27/2022	99,729	41,234	45,422	75,878	103,681	365,944
6/28/2022	106,635	23,206	48,566	81,226	102,375	362,007
6/29/2022	114,982	0	54,740	83,114	110,797	363,633
6/30/2022	103,203	0	54,722	83,561	111,300	352,785
						Total 29,302,181

2.14 Facility Layout Map (Requirement 14)

Figure 2.14-1 is the facility layout map for CY 2022 Quarter 2, showing the location and number of each well.

2.15 Groundwater Elevation Contour Map (Requirement 15)

Figure 2.3-1 provides the groundwater elevation contour map. Section 2.3 provides an explanation of how this map was generated.

3.0 REFERENCES

Carson, J., A. Jordan, A. Rice, P. Black, T. Stockton, D. Katzman, and L. Foster. "Bayesian Approach to Estimation of Water Table Elevations Using Historical Rasters as Prior Information," paper presented at WM2020 Conference, March 8–12, 2020, Phoenix, Arizona (Carson 2020).

EPA (U.S. Environmental Protection Agency) January 2008. "A Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems Final Project Report," EPA document number EPA/600/R-08/003, Office of Research and Development National Risk Management Research Laboratory (Cincinnati, Ohio)/Groundwater and Ecosystems Restoration Division (Ada, Oklahoma) (EPA 2008).

LANL (Los Alamos National Laboratory) October 2009. "Investigation Report for Sandia Canyon," Los Alamos National Laboratory document LA-UR-09-6450, Los Alamos, New Mexico (LANL 2009).

N3B (Newport News Nuclear BWXT-Los Alamos, LLC) June 2022. "Quarterly Report for the Discharge of Treated Groundwater to the Regional Aquifer under Discharge Permit 1835, Calendar Year 2022 Quarter 1," Newport News Nuclear BWXT-Los Alamos, LLC, document number EM2022-0287, Los Alamos, New Mexico (N3B 2022).

NMED (New Mexico Environment Department) June 27, 2017. "Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory Pilot Scale Molasses Amendment Study in Regional Aquifer Monitoring Well R-28, AI:856 PRD20170003," New Mexico Environment Department letter to J.C. Bretzke (LANL) and A.Q. Duran (EM-LA) from M. Hunter (NMED-GWQB), Santa Fe, New Mexico (NMED 2017a).

NMED (New Mexico Environment Department) July 18, 2017. "Response to Notice of Intent to Discharge; Discharge Permit Not Required for Los Alamos National Laboratory Pilot Scale Sodium Dithionite Amendment Study in Regional Aquifer Monitoring Well R-42, AI:856 PRD20170003," New Mexico Environment Department letter to J.C. Bretzke (LANL) and A.Q. Duran (EM-LA) from M. Hunter (NMED-GWQB), Santa Fe, New Mexico (NMED 2017b).

NMED (New Mexico Environment Department) June 2022. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico (NMED 2022).

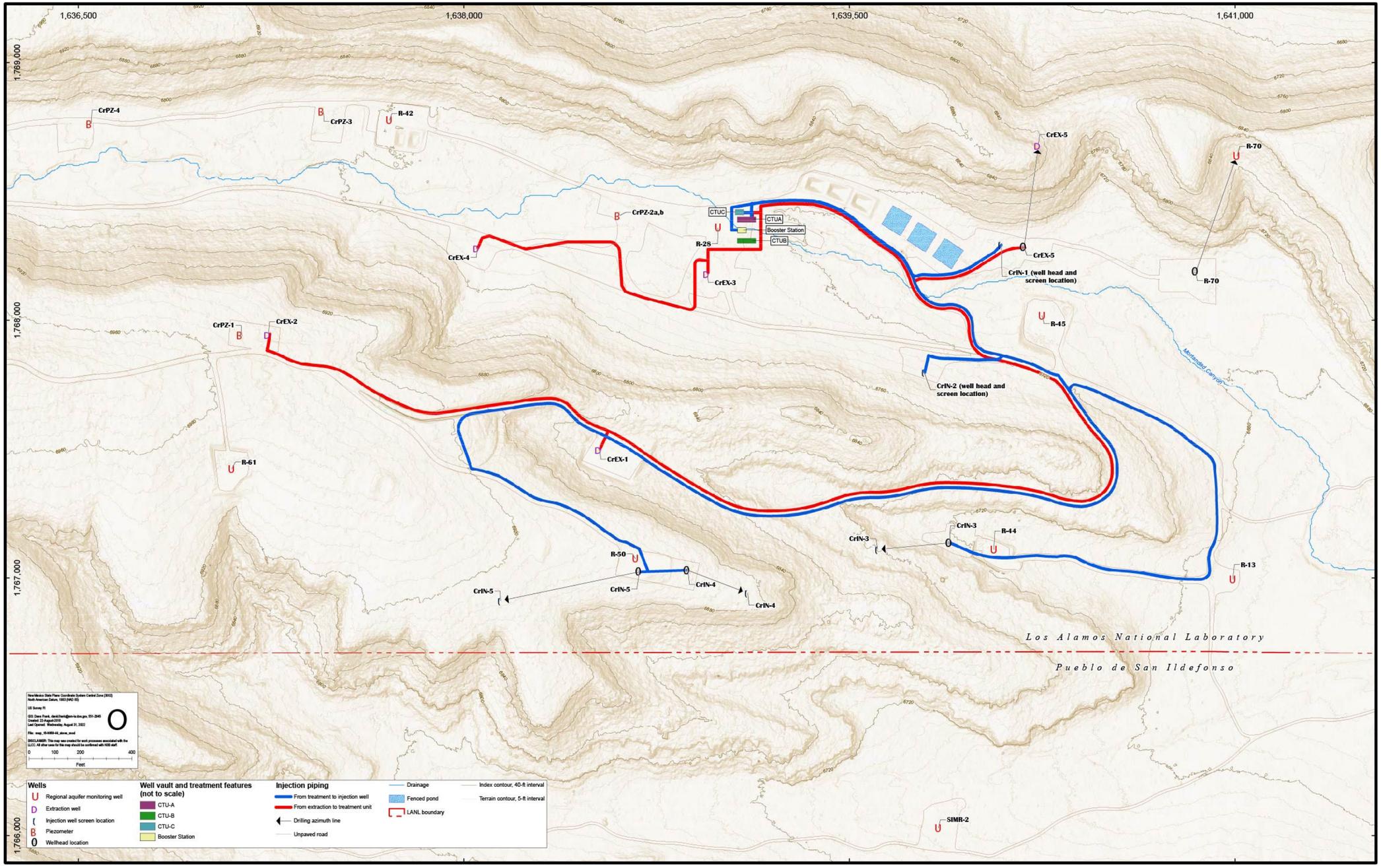

Figure 2.14-1 Facility layout map – CY 2022 Quarter 2, DP-1835