



2022 Annual Groundwater Monitoring and Corrective Action Report

CCR Annual Monitoring Report

Fly Ash Area Landfill and Bottom Ash Area Landfill

Bonanza Power Plant Vernal, Utah

Prepared for
Deseret Power Electric Cooperative

January 2023

2022 Annual Groundwater Monitoring and Corrective Action Report

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Bonanza Power Plant Vernal, Utah

January 2023

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Acronyms

Acronym	Description
ASD	Alternative Source Demonstration
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
FGD	Flue Gas Desulfurization
SSI	Statistically Significant Increase

Summary for CCR Unit §257.90(e)(6)

At the beginning, end, and throughout 2022, the CCR unit was operating under a detection monitoring program as described in 40 CFR 257.94. Pursuant to §257.94, statistically significant increases (SSIs) were determined for fluoride at monitoring well FA-DG4 during the fall 2021 sampling event, for pH at monitoring well BA-DG3 in fall 2021, spring 2022, and fall 2022, and for pH at monitoring well BA-DG1 in fall 2022. The 2022 monitoring data are shown on the (oversized) Large Table 1.

An alternative source demonstration (ASD) has been completed for these well/parameters for the fall 2021 and spring 2022 events, as summarized in Appendix B of this report. The statistical results of the fall 2022 detection monitoring event have been evaluated, and an alternative source investigation is ongoing, with results, including an ASD if appropriate, anticipated in spring 2023. Therefore, no assessment monitoring program (§257.95), or related corrective or remedial measures (§§257.96, 257.97, and 257.98), were necessary for 2022.

1 Introduction

Deseret Power Electric Cooperative (Deseret) operates Bonanza Power Plant, a 500 MW coal-fired generation unit near Vernal, Utah. Coal combustion residuals (CCR) from the generating station are placed in two on-site CCR units: the Fly Ash Area Landfill and the Bottom Ash Landfill as shown on Figure 1.

These landfills are existing CCR landfills that are required to comply with the provisions of the US Environmental Protection Agency (EPA) CCR Rule (40 CFR Parts 257 and 261 Disposal of Coal Combustion Residuals from Electric Utilities). The Fly Ash Area landfill contains primarily fly ash and flue gas desulfurization (FGD) solids. The Bottom Ash Area landfill is used to manage bottom ash and boiler slag from the facility.

The location of each of the landfills and their associated groundwater monitoring systems are depicted in Figure 1. These systems are not considered Multiunit Groundwater Monitoring Systems.

1.1 Purpose

As stated in §257.90(e), the purpose of the Annual Groundwater Monitoring and Corrective Action Report (Annual Report) is to:

- Document the status of the monitoring and corrective action program for the CCR units
- Summarize key actions completed
- Describe any problems encountered
- Discuss actions to resolve the problems
- Highlight key activities for the upcoming year

1.2 Status of the Groundwater Monitoring and Corrective Action Program

- Both CCR units were in detection monitoring
- All wells in the CCR groundwater monitoring system were sampled and analyzed for Appendix III parameters

1.3 CCR Rule Requirements

This Annual Report has been prepared in accordance with the requirements of §257.90(e) of the CCR Rule, as outlined in the following Table 1-1.

Table 1-1 CCR Rule Requirements

CCR Rule Reference	Content Required in Report	Location
§257.90(e)(1)	Map showing the CCR unit and all monitoring wells that are part of the groundwater monitoring system	Section 2.1.1 Documentation; see Figure 1
§257.90(e)(2)	Discuss any new or decommissioned monitoring wells	Section 2.1.2 Changes to Monitoring System
§257.90(e)(3)	Provide the number and date groundwater samples were collected, and the monitoring (i.e., detection or assessment)	Section 2.2 Monitoring and Analytical Results
§257.90(e)(4)	Discuss any transition between monitoring programs	Not applicable- no transition between monitoring programs has occurred.
§257.90(e)(5)	Other information specified in §257.90 through §257.98	Section 2.4 Key Actions Completed/Problems Encountered
§257.90(e)(6)	Overview at beginning of annual report	Summary for CCR Unit §257.90(e)(6)

2 Groundwater Monitoring and Corrective Action Program

This section documents the status of the groundwater monitoring and corrective action program for the CCR units for 2022. The groundwater monitoring system is described in Section 2.1, the monitoring and analytical results are described in Section 2.2, groundwater direction and flow rates in Section 2.3, key actions completed and problems encountered are described in Section 2.4, and key activities planned for 2023 are described in Section 2.5.

2.1 Groundwater Monitoring System

2.1.1 Documentation

Figure 1 shows an aerial image of the CCR units and all background (or upgradient) and downgradient monitoring wells, including the well identification numbers, that are part of the groundwater monitoring program, as required by §257.90(e)(1).

2.1.2 Changes to Monitoring System

An existing water level piezometer in the Fly Ash Area previously labeled PZ-212 was added to the groundwater monitoring system in late 2022 as a downgradient well (Figure 1). This well was installed in late 2021 during the groundwater modeling investigation being conducted separately from the CCR monitoring. PZ-212 was renamed FA-DG5 to join the CCR groundwater monitoring system. A baseline sampling program has been initiated to collect eight independent samples per the CCR Rule.

The location of FA-DG5 is expected to be downgradient of the boundary between where upgradient groundwater is predominantly from the north (represented by FA-UG1) mixes with groundwater from the west resulting from the leakage from the North Evaporation Pond (a non-CCR unit) represented by FA-UG2.

The well is not shown on Figure 2 because it was not added to the network until December of 2022 when baseline monitoring of FA-DG5 began. A well log and results of 2022 baseline sample are included in Appendix D. Based on groundwater flow estimates obtained during the addition of FA-UG2, the baseline samples will be collected on an approximately 6-week schedule to maintain temporal independence in accordance with the statistical monitoring plan (Burns and MacDonald, 2017b).

2.2 Monitoring and Analytical Results

2.2.1 Existing Monitoring System Wells

As shown in Table 2-1 below, a total of nine detection monitoring groundwater samples were collected during each of two semiannual sampling events from the monitoring system wells. Relevant sampling events occurred in spring 2022 and fall 2022. Results from the 2022 sampling events are included in Table 2-2, Table 2-3, Large Table 1, and Appendix A.

Table 2-1 Semiannual Detection Monitoring Well Sample Events

Well	Spring 2022 Semiannual Monitoring Date	Spring 2022 Resampling Date	Fall 2022 Semiannual Monitoring Date	Fall 2022 Resampling Date
FA-UG1	4/18/2022	--	10/10/2022	--
FA-UG2 (PZ-11)	4/19/2022	--	10/11/2022	--
FA-DG2	4/19/2022	--	10/17/2022	--
FA-DG3	4/20/2022	--	10/12/2022	--
FA-DG4	4/20/2022	--	10/12/2022	--
BA-UG1	4/19/2022	--	10/11/2022	--
BA-DG1	4/19/2022	--	10/17/2022	12/6/2022
BA-DG2	4/18/2022	--	10/17/2022	12/6/2022
BA-DG3	4/18/2022	7/7/2022	10/17/2022	12/7/2022

Fall 2021 SSI and Subsequent ASD

Sampling for the fall 2021 monitoring event was conducted on October 18-20, 2021. Data received on November 8, 2021, indicated two potential SSIs for the fall 2021 event: an elevated pH at monitoring well BA-DG3 and elevated fluoride levels in FA-DG4. On October 27, 2021, a verification resample was taken from well BA-DG3 to verify the potential pH SSI identified from the Fall 2021 event. This information was included in the 2021 Annual Report (Barr, 2022). On February 4, 2022, SSIs were determined for pH at monitoring well BA-DG3 and fluoride at FA-DG4.

An Alternative Source Demonstration (ASD) memorandum regarding the fall 2021 SSI was completed on May 4, 2022. The results of the ASD concluded that the SSIs were attributable to a source other than the CCR units listed in this report. The ASD is provided in Appendix B.

Spring 2022 Sampling Event

Table 2-2 summarizes the verified SSIs determined from the spring 2022 event. During the April 18-20, 2022, sampling event, a potential SSI for pH was identified in the Bottom Ash Landfill Area for monitoring well BA-DG3. Verification resampling was conducted on July 7, 2022. The complete dataset for the detection monitoring event can be found in Large Table 1.

Table 2-2 Verified SSI for the Spring 2022 Event

Well	Constituent/SSI
BA-DG3	pH

An ASD was completed with regard to the SSI for pH identified in Table 2-2 on November 4, 2022. The ASD is included in Appendix B and concluded that the SSI was attributable to a source other than the CCR unit.

Fall 2022 Sampling Event

Sampling for the fall 2022 monitoring event was conducted on October 10-12 and 17, 2022. Preliminary statistical assessment of the fall 2022 results again indicated elevated pH at monitoring well BA-DG3 and also indicated low pH at monitoring well BA-DG1 (Large Table 1).

On December 6-7, 2022, verification resamples were taken from wells BA-DG1 and BA-DG3 to verify the potential pH SSIs identified from the Fall 2022 event. Table 2-3 summarizes the verified SSIs determined from the fall event. The fall 2022 SSIs will be evaluated against previous ASDs, and a new ASD will be generated if appropriate.

Table 2-3 Verified SSI for the Fall 2022 Event

Well	Constituent/SSI
BA-DG1	pH
BA-DG3	pH

2.3 Groundwater Flow Direction and Rates

Groundwater flow rates and gradients were calculated using the data collected from the 2022 water level measurements and from aquifer property data presented in the 2017 Groundwater Monitoring System Certification (Burns & McDonnell, 2017a). The calculation tables for groundwater flow rates, directions, and gradients are located in Appendix C. Groundwater elevation contours are shown for each semiannual sampling event on Figure 2 and Figure 3 for the Fly Ash Area and on Figure 4 and Figure 5 for the Bottom Ash Area.

The groundwater in the Fly Ash Landfill area generally flows in the southeast direction (Figure 2 and Figure 3) at rates ranging from a low of 0.002 ft/day to a high of 0.1 ft/day with an average horizontal gradient of 0.004. Groundwater in the Bottom Ash Landfill area generally flows south (Figure 4 and Figure 5) at rates ranging from 0.005 ft/day to 0.045 ft/day with an average horizontal gradient of 0.003 (Appendix C).

The flow direction in the northeast corner of the North Evaporation Pond is deflected to the east likely due to mounding of the water table under the unlined pond. Groundwater flow upgradient of the Bottom Ash Landfill is partly influenced by the capture zone created by the Pumpback system, which creates an area of drawdown near the center of the plant site and creates a flow divide north of BA-UG1 so that groundwater flow is generally inward toward the main power block (Loughlin, 2017).

2.4 Key Actions Completed/Problems Encountered

The following key actions were completed for the groundwater monitoring program through 2022:

- Completed semiannual detection monitoring sampling for each background and downgradient well.

-
- Prepared a successful ASD for fall 2021 event for pH at BA-DG3 and fluoride at FA-DG4.
 - Conducted statistical evaluation of the spring 2022 and fall 2022 groundwater detection monitoring data.
 - Determined, pursuant to §257.93(h), that an SSI over background levels did not occur for any of the constituents listed in Appendix III at any downgradient monitoring well with the exception of pH at BA-DG3 during the spring 2022 event and pH at BA-DG1 and BA-DG3 during the fall 2022 event, as shown in Table 2-2 and Table 2-3.
 - Successful ASDs concluded that the source of the SSIs in fall 2021 and spring 2022 was not the CCR unit. The ASDs for fall 2021 and spring 2022 are provided in Appendix B.

No problems were encountered in 2022.

2.5 Key Activities for Upcoming Year

The following key groundwater monitoring program activities are planned for 2023:

- Continue semiannual detection monitoring according to the Sampling and Analysis Program (Deseret, 2016).
- Evaluate analytical results from two 2023 semiannual detection monitoring events for SSIs according to the CCR Selected Statistical Method Certification (Burns & McDonnell, 2017b).
- Review the conceptual site model and provide recommendations for improvements to the monitoring well network if needed.
- The fall 2022 SSIs will be evaluated against previous ASDs, and a new ASD will be generated for the fall 2022 results per the CCR rule and included in the 2023 Annual CCR Report if appropriate; the site will transition to assessment monitoring if no successful ASD is completed.

3 References

Barr, 2022, 2021 Annual Groundwater Monitoring and Corrective Action Report, Bonanza Power Plant. Prepared for Deseret Power Electric Cooperative. January 2022.

Burns & McDonnell, 2017a, Groundwater Monitoring System Certification – Bonanza Power Plant, Vernal, Utah. October 2017.

Burns & McDonnell, 2017b, Selected Statistical Method Certification, Deseret Generation and Transmission Cooperative – Bonanza Power Plant, Vernal, Utah. October 2017.

Deseret Power Electric Cooperative, 2016, Bonanza Power Plant CCR Groundwater Monitoring Wells Sampling and Analysis Program. May 2016.

Loughlin Water Associates, 2017. Bonanza Power Plant, Coal Combustion Residuals, Monitoring Well Installation Report. Pumpback Capture Zone shown on Drawing 6. January 2017.

Large Tables

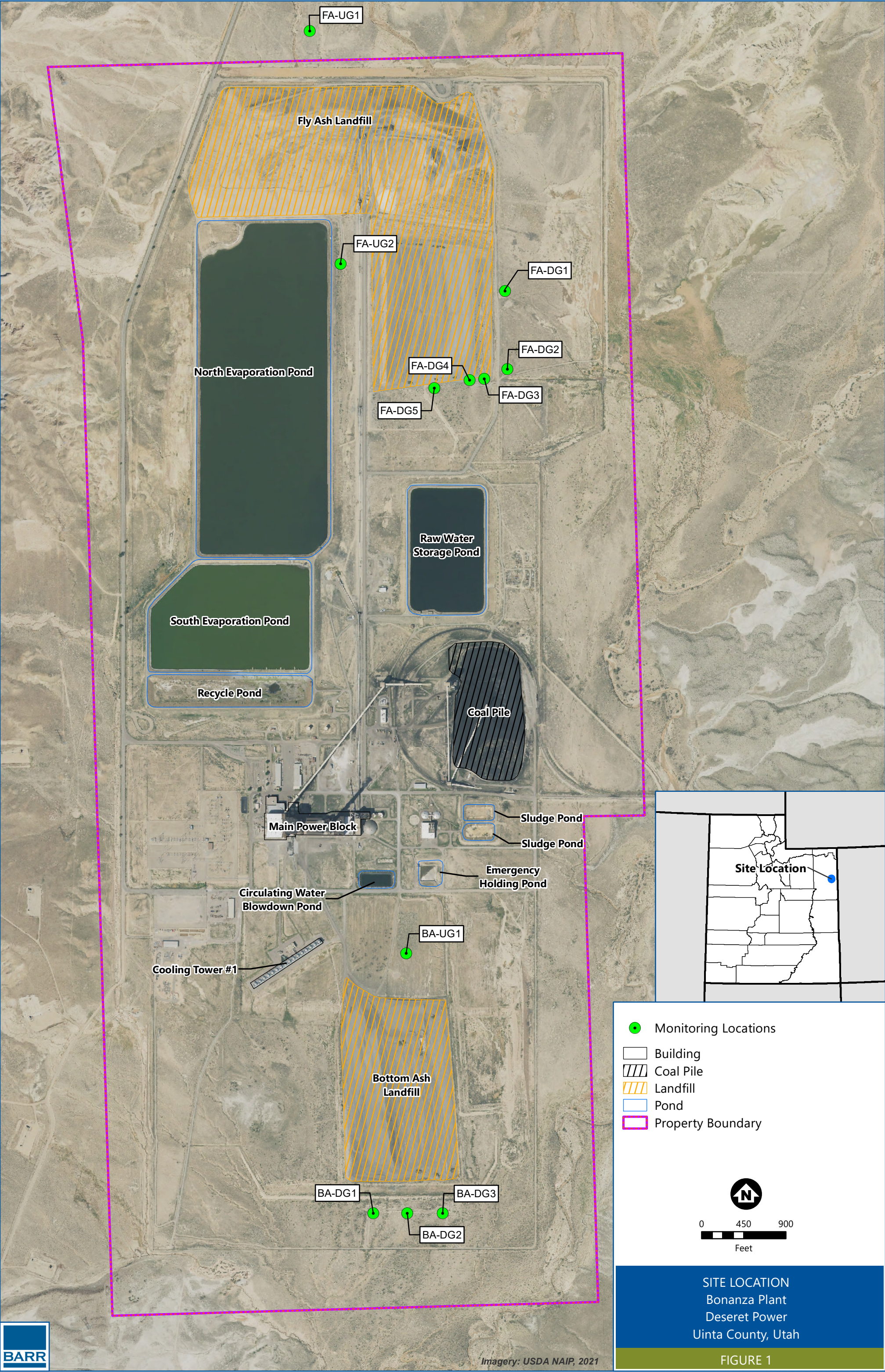
Large Table 1
Water Quality Analytical Data Summary
2022 CCR Annual Report - Bonanza Power Plant
Deseret Power Cooperative

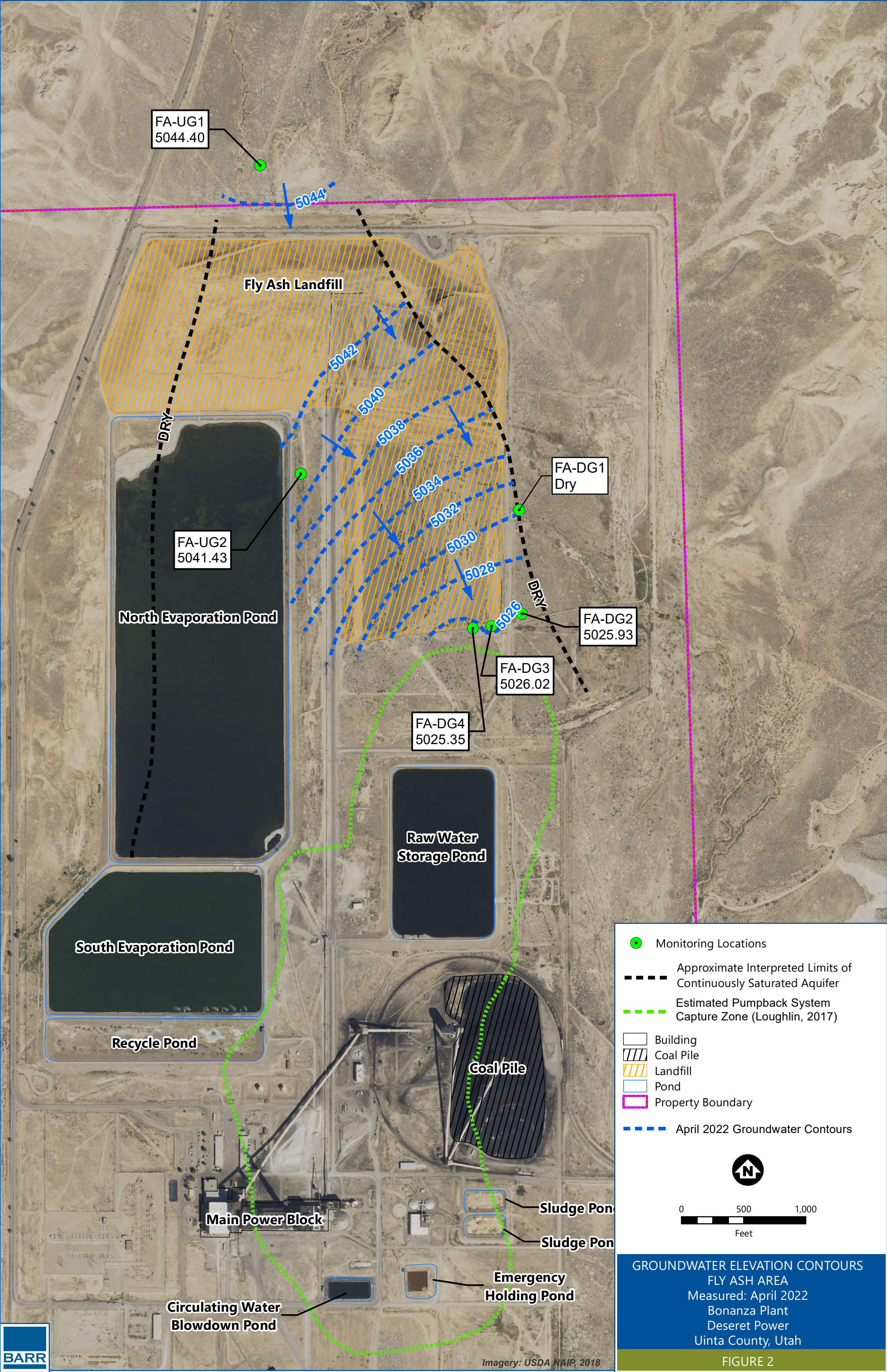
Appendix III Parameters Analysis Location Units			Boron, total Lab mg/l	Calcium, total Lab mg/l	Chloride Lab mg/l	Fluoride Lab mg/l	pH ¹ Field pH units	Solids, total dissolved Lab mg/l	Sulfate, as SO4 Lab mg/l	Water Level Elevation Field ft amsl
Location	Date	Sample Type								
Bottom Ash Landfill										
BA - DG1	4/19/2022	N	9.23	172	588	5.7	7.3	8640	4180	4986.90
BA - DG1	10/17/2022	N	10.1	196	707	1.48	7.2	8600	4860	4986.47
BA - DG1	12/06/2022	R	--	--	--	--	7.2	--	--	4986.53
BA - DG2	4/18/2022	N	37.6	408	661	7.7	7.1	12400	6650	4986.84
BA - DG2	10/17/2022	N	41.1	451	760	2.23	7.1	12700	8080	4986.56
BA - DG3	4/18/2022	N	10.5	45.8	375	11.5	8.0	5730	2650	4985.65
BA - DG3	7/07/2022	R	--	--	--	--	8.0	--	--	4985.49
BA - DG3	10/17/2022	N	10.6	45.8	427	5.08	7.9	5400	2860	4985.42
BA - DG3	12/06/2022	R	--	--	--	--	7.9	--	--	4985.46
BA - UG1	4/19/2022	N	146	416	1320	3.0	7.0	19800	10500	4996.14
BA - UG1	10/11/2022	N	146	431	1510	4.69	7.0	19700	13100	4995.77
Fly Ash Landfill										
FA - DG2	4/19/2022	N	7.56	< 2.0 U	629	43.8	9.0	13500	4910	5025.93
FA - DG2	10/17/2022	N	7.52	1.3	676	37.1	9.0	12500	5280	5025.63
FA - DG3	4/20/2022	N	2.36	3.0	196	8.4	8.7	3700	1450	5026.02
FA - DG3	10/12/2022	N	2.23	3.1	228	5.61	8.6	3480	1620	5025.69
FA - DG4	4/20/2022	N	12.0	50.6	787	< 0.1 U	7.6	12200	3810	5025.35
FA - DG4	10/12/2022	N	10.6	59.4	946	0.958	7.6	8200	4150	5025.03
FA - UG1	4/18/2022	N	0.65	12.0	31.9	1.7	8.0	1050	325	5044.40
FA - UG1	4/18/2022	FD	0.71	12.4	35.2	1.5	--	1020	281	--
FA - UG1	10/10/2022	N	0.79	7.6 J	36.5	1.63	8.0	1040	350	5044.30
FA - UG1	10/10/2022	FD	0.64	12.9 J	38.1	1.55	--	1010	378	--
FA - UG2	4/19/2022	N	45.2	493	1490	0.9	6.9	15100	7670	5041.43
FA - UG2	10/11/2022	N	49.2	549	1730	0.279	6.9	15200	9360	5041.32

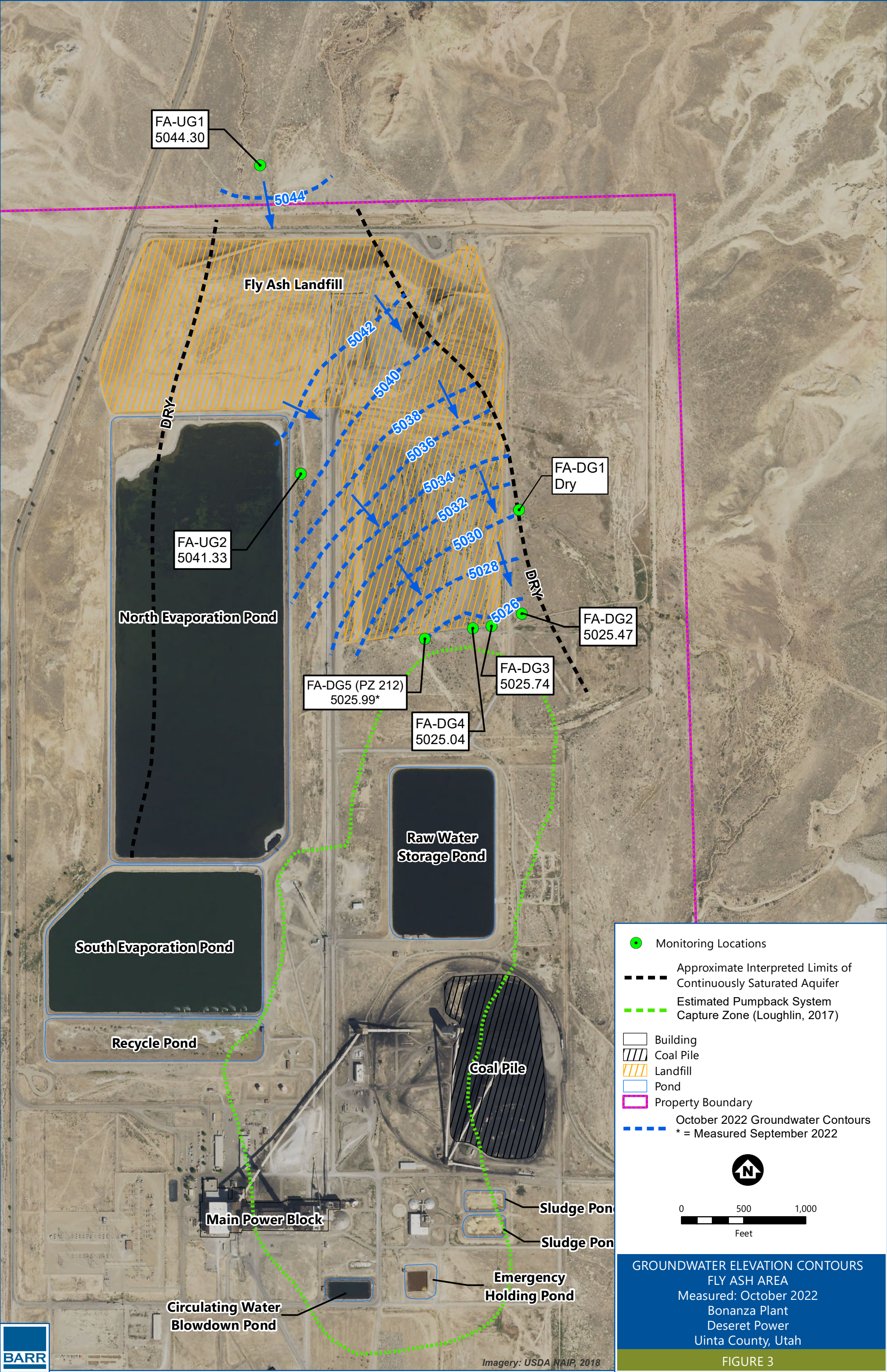
Barr Standard Footnotes and Qualifiers

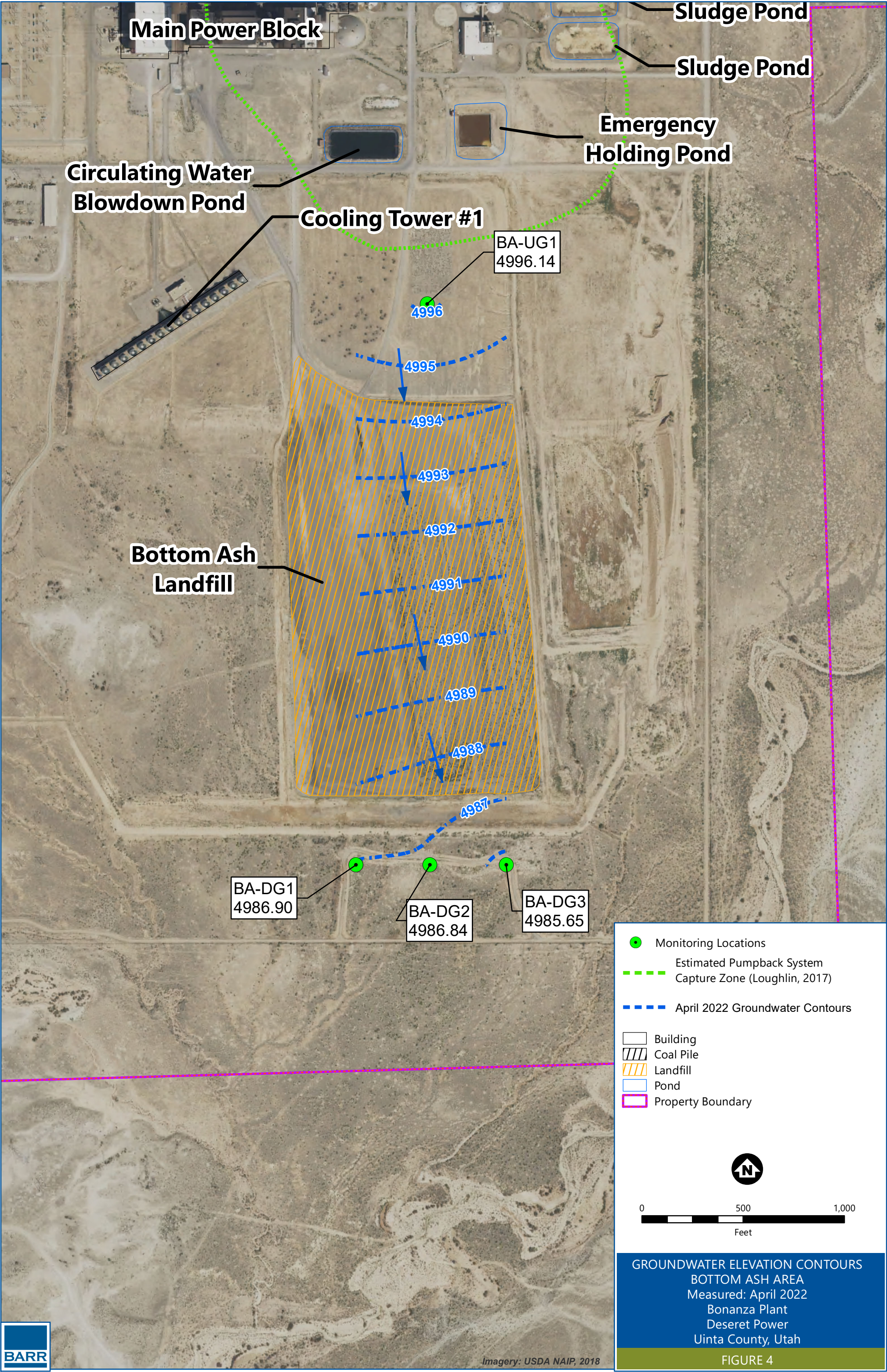
--	Not analyzed/Not available.
N	Sample Type: Normal Detection Monitoring
FD	Sample Type: Field Duplicate
R	Sample Type: Verification Resample
1	pH was rounded to the nearest tenth for statistical analysis due to instrument precision.
J	Estimated detected value. Either certain QC criteria were not met or the concentration is between the laboratory's detection and quantitation limits.
U	The analyte was analyzed for, but was not detected.

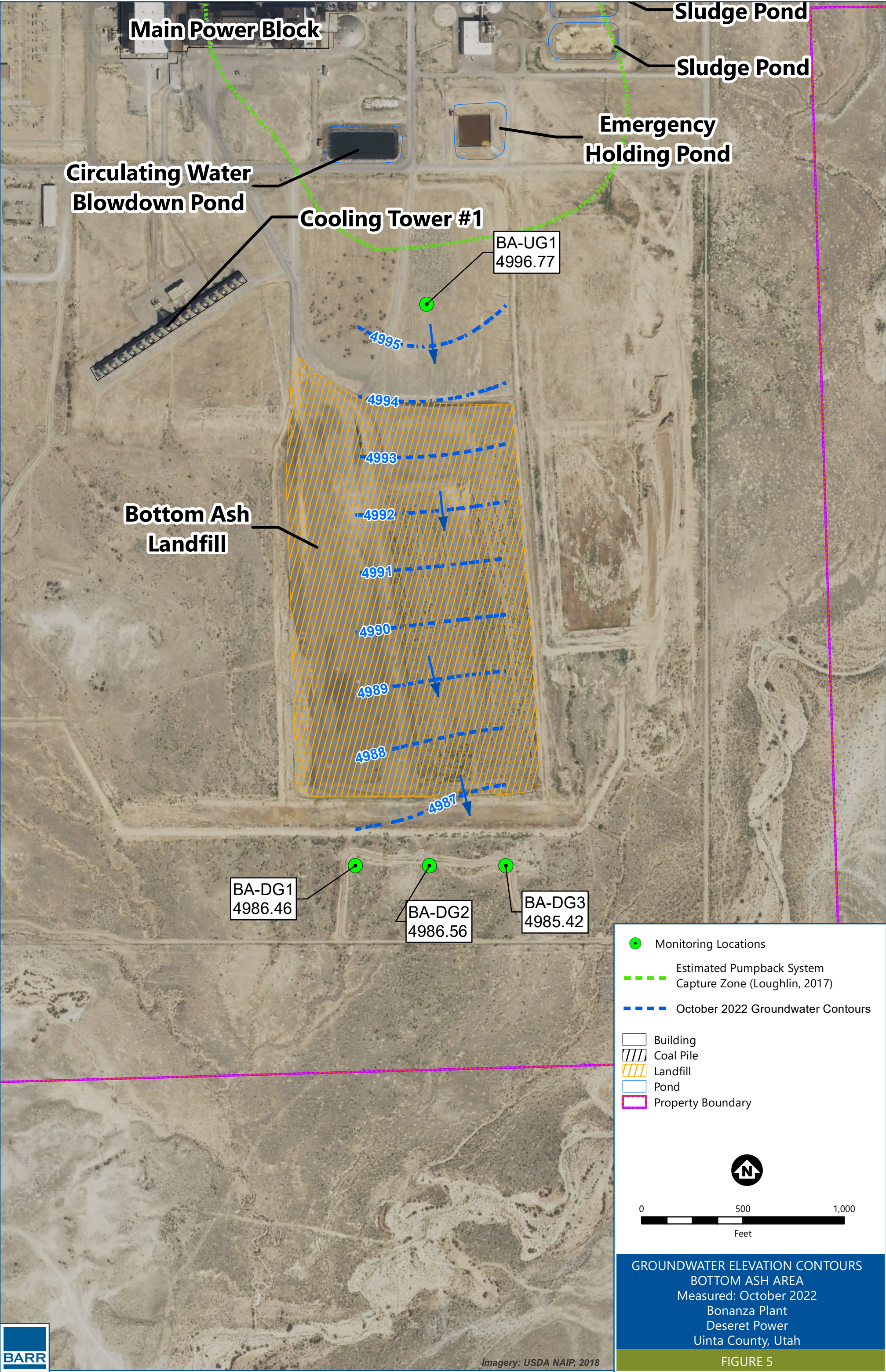
Figures











Appendices

Appendix A

Laboratory Reports and Field Sheets

Spring 2022 Sampling Event: April 2022



5/24/2022

Work Order: 22D1554
Project: Bonanza - CCR Biannual

Deseret Power Electric Cooperative

Attn: Tyler Esplin

12500 East 25500 South

Vernal, UT 84078-8525

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.



Approved By:

Dave Gayer, Laboratory Director



Deseret Power Electric Cooperative
12500 East 25500 South
Vernal, UT 84078-8525

Project: Bonanza - CCR Biannual
Project Manager: Tyler Esplin

<u>Laboratory ID</u>	<u>Sample Name</u>
22D1554-01	CCR - QA Dup
22D1554-02	BA - DG1
22D1554-03	BA - DG2
22D1554-04	BA - DG3
22D1554-05	BA - UG1
22D1554-06	FA - DG2
22D1554-07	FA - DG3
22D1554-08	FA - DG4
22D1554-09	FA - UG1
22D1554-10	FA - UG2
22D1554-11	NEP

Amended Report Narrative

Report Changes:

Samples for fluoride were re-analyzed to obtain a lower detection limit (MRL). No other analytical data was changed in this report.



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Certificate of Analysis

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Tyler Esplin
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: CCR - QA Dup

Matrix: Water

Lab ID: 22D1554-01

Date Sampled: 4/18/22 11:45

Sampled By: Trenton Keller

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	35.2	mg/L	1.0	EPA 300.0	5/4/22	5/5/22	
Fluoride	1.5	mg/L	0.1	EPA 300.0	5/4/22	5/5/22	
Sulfate	281	mg/L	100	EPA 300.0	4/22/22	4/23/22	
Total Dissolved Solids (TDS)	1020	mg/L	20	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	0.71	mg/L	0.05	EPA 200.7	4/29/22	4/29/22	
Calcium, Total	12.4	mg/L	0.2	EPA 200.7	4/29/22	4/29/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: BA - DG1

Matrix: Water

Date Sampled: 4/19/22 13:20

Sampled By: Trenton Keller

Lab ID: 22D1554-02

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	588	mg/L	100	EPA 300.0	4/23/22	4/23/22	
Fluoride	5.7	mg/L	0.1	EPA 300.0	5/11/22	5/11/22	
Sulfate	4180	mg/L	100	EPA 300.0	4/22/22	4/23/22	
Total Dissolved Solids (TDS)	8640	mg/L	100	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	9.23	mg/L	0.50	EPA 200.7	4/29/22	4/29/22	
Calcium, Total	172	mg/L	2.0	EPA 200.7	4/29/22	4/29/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: BA - DG2

Matrix: Water

Date Sampled: 4/18/22 14:54

Sampled By: Trenton Keller

Lab ID: 22D1554-03

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	661	mg/L	50.0	EPA 300.0	4/23/22	4/23/22	
Fluoride	7.7	mg/L	0.1	EPA 300.0	5/11/22	5/11/22	
Sulfate	6650	mg/L	100	EPA 300.0	4/25/22	4/25/22	
Total Dissolved Solids (TDS)	12400	mg/L	20	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	37.6	mg/L	0.50	EPA 200.7	4/29/22	5/2/22	
Calcium, Total	408	mg/L	2.0	EPA 200.7	4/29/22	5/2/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: BA - DG3

Matrix: Water

Date Sampled: 4/18/22 13:36

Sampled By: Trenton Keller

Lab ID: 22D1554-04

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	375	mg/L	100	EPA 300.0	4/23/22	4/23/22	
Fluoride	11.5	mg/L	0.1	EPA 300.0	5/11/22	5/11/22	
Sulfate	2650	mg/L	100	EPA 300.0	4/22/22	4/23/22	
Total Dissolved Solids (TDS)	5730	mg/L	20	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	10.5	mg/L	0.50	EPA 200.7	4/29/22	4/29/22	
Calcium, Total	45.8	mg/L	2.0	EPA 200.7	4/29/22	4/29/22	



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Tyler Esplin
12500 East 25500 South
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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: BA - UG1

Matrix: Water

Lab ID: 22D1554-05

Date Sampled: 4/19/22 14:45

Sampled By: Trenton Keller

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	1320	mg/L	200	EPA 300.0	4/25/22	4/25/22	
Fluoride	3.0	mg/L	0.1	EPA 300.0	5/11/22	5/11/22	
Sulfate	10500	mg/L	200	EPA 300.0	4/25/22	4/25/22	
Total Dissolved Solids (TDS)	19800	mg/L	100	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	146	mg/L	0.50	EPA 200.7	4/29/22	5/2/22	
Calcium, Total	416	mg/L	2.0	EPA 200.7	4/29/22	5/2/22	



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Deseret Power Electric Cooperative
Tyler Esplin
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: FA - DG2

Matrix: Water

Date Sampled: 4/19/22 10:11

Sampled By: Trenton Keller

Lab ID: 22D1554-06

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	629	mg/L	20.0	EPA 300.0	4/23/22	4/23/22	
Fluoride	43.8	mg/L	2.0	EPA 300.0	4/23/22	4/23/22	APH-O
Sulfate	4910	mg/L	100	EPA 300.0	4/25/22	4/25/22	
Total Dissolved Solids (TDS)	13500	mg/L	100	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	7.56	mg/L	0.50	EPA 200.7	5/2/22	5/2/22	
Calcium, Total	ND	mg/L	2.0	EPA 200.7	5/2/22	5/2/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: FA - DG3

Matrix: Water

Date Sampled: 4/20/22 9:05

Sampled By: Trenton Keller

Lab ID: 22D1554-07

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	196	mg/L	100	EPA 300.0	4/25/22	4/25/22	
Fluoride	8.4	mg/L	0.1	EPA 300.0	5/11/22	5/11/22	
Sulfate	1450	mg/L	100	EPA 300.0	4/25/22	4/25/22	
Total Dissolved Solids (TDS)	3700	mg/L	20	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	2.36	mg/L	0.25	EPA 200.7	4/29/22	4/29/22	
Calcium, Total	3.0	mg/L	1.0	EPA 200.7	4/29/22	4/29/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: FA - DG4

Matrix: Water

Date Sampled: 4/20/22 10:40

Sampled By: Trenton Keller

Lab ID: 22D1554-08

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	787	mg/L	100	EPA 300.0	4/25/22	4/25/22	
Fluoride	ND	mg/L	0.1	EPA 300.0	5/11/22	5/11/22	
Sulfate	3810	mg/L	100	EPA 300.0	4/25/22	4/25/22	
Total Dissolved Solids (TDS)	12200	mg/L	100	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	12.0	mg/L	0.50	EPA 200.7	4/29/22	4/29/22	
Calcium, Total	50.6	mg/L	2.0	EPA 200.7	4/29/22	4/29/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: FA - UG1

Matrix: Water

Lab ID: 22D1554-09

Date Sampled: 4/18/22 10:31

Sampled By: Trenton Keller

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	31.9	mg/L	5.0	EPA 300.0	4/23/22	4/23/22	
Fluoride	1.7	mg/L	0.5	EPA 300.0	4/23/22	4/23/22	
Sulfate	325	mg/L	5.0	EPA 300.0	4/22/22	4/23/22	
Total Dissolved Solids (TDS)	1050	mg/L	20	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	0.65	mg/L	0.05	EPA 200.7	4/29/22	4/29/22	
Calcium, Total	12.0	mg/L	0.2	EPA 200.7	4/29/22	4/29/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: FA - UG2

Matrix: Water

Date Sampled: 4/19/22 8:53

Sampled By: Trenton Keller

Lab ID: 22D1554-10

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	1490	mg/L	100	EPA 300.0	4/23/22	4/23/22	
Fluoride	0.9	mg/L	0.1	EPA 300.0	5/11/22	5/11/22	
Sulfate	7670	mg/L	100	EPA 300.0	4/22/22	4/23/22	
Total Dissolved Solids (TDS)	15100	mg/L	20	SM 2540 C	4/25/22	4/25/22	
Metals							
Boron, Total	45.2	mg/L	0.50	EPA 200.7	4/26/22	4/27/22	
Calcium, Total	493	mg/L	2.0	EPA 200.7	4/26/22	4/27/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Sample ID: NEP

Matrix: Water

Lab ID: 22D1554-11

Date Sampled: 4/18/22 16:20

Sampled By: Trenton Keller

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Alkalinity - Bicarbonate (as CaCO ₃)	506	mg/L	1.0	SM 2320 B	4/22/22	4/22/22	
Alkalinity - Carbonate (as CaCO ₃)	ND	mg/L	1.0	SM 2320 B	4/22/22	4/22/22	
Alkalinity - Hydroxide (as CaCO ₃)	ND	mg/L	1.0	SM 2320 B	4/22/22	4/22/22	
Alkalinity - Total (as CaCO ₃)	506	mg/L	1.0	SM 2320 B	4/22/22	4/22/22	
Chloride	2360	mg/L	200	EPA 300.0	4/23/22	4/23/22	
Fluoride	50.8	mg/L	0.5	EPA 300.0	5/11/22	5/11/22	
Sulfate	13400	mg/L	200	EPA 300.0	4/22/22	4/23/22	
Total Dissolved Solids (TDS)	26700	mg/L	20	SM 2540 C	4/25/22	4/25/22	E
Metals							
Boron, Total	93.9	mg/L	0.50	EPA 200.7	4/26/22	4/27/22	
Calcium, Total	577	mg/L	2.0	EPA 200.7	4/26/22	4/27/22	
Magnesium, Total	1830	mg/L	2.0	EPA 200.7	4/26/22	4/27/22	
Potassium, Total	78.7	mg/L	5.0	EPA 200.7	4/26/22	4/27/22	
Sodium, Dissolved	4190	mg/L	5.0	EPA 200.7	5/2/22	5/2/22	
Sodium, Total	3770	mg/L	5.0	EPA 200.7	4/26/22	4/27/22	



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PO#: 172308
Receipt: 4/21/22 11:10 @ 4.1 °C
Date Reported: 5/24/2022
Project Name: Bonanza - CCR Biannual

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).

1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.

1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.

1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.

Flag Descriptions

APH-O = This reported value was obtained from the batch that was originally analyzed within the EPA-recommended holding time. A confirmatory re-analysis was performed outside of that holding time.

E = The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate (CLP E-flag).

(Tier 2 QC)

BILLING ADDRESS: _____
BILLING CITY/STATE/ZIP: _____
PURCHASE ORDER #: _____



TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

page 1 of 2

[illegible]

Bottles: AQ 1170
M 1186

() Custody Seals () COC Complete
() Containers Intact () Sample Volume OK
() COC/Labels Linked () Headspace Present (VOC)
() Received on Ice () Temp Blank
() Correct Containers () Within Hold Time
() COC Included

Checked by: AP5

Checked by:

Sampled by: [print] <i>Trenton Keller</i>	Sampled by: [signature] <i>T. Keller</i>
Special Instructions:	
Relinquished by: [signature] <i>T. Keller</i>	Date/Time 4-20-22 13:00
Relinquished by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time

ON ICE NOT ON ICE Temp (C°): 41

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Date/Time	4-20-22	13:00
Date/Time	4-21-22	11:10

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866.792.0093 FAX
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Payment Terms are net 30 days OAC 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

12 849 747 01 6399 8246

(Tier 2 QC)



CHEMTECH-FORD
LABORATORIES

BILLING ADDRESS: _____
BILLING CITY/STATE/ZIP: _____
PURCHASE ORDER #: _____

* Expedited turnaround subject to additional charge

Please fill out the fields highlighted in light blue.

page 2 of 2

22D1554

Lab Use Only	CLIENT SAMPLE INFORMATION																							
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	Alkalinity	TDS	Anions: C	ICP Meta												Total Coliform	Total Coliform	HPC (Plate C	E. Coll Only
-11	11. NEP	4-18-22	16:20	Water		X	X	X	X															
	2.																							
	3.																							
	4.																							
	5.																							
	6.																							
	7.																							
	8.																							
	9.																							
	10.																							
Sampled by: [print] Trenton Keller		Sampled by: [signature]				☒ ON ICE		☐ NOT ON ICE		Temp (C°): 4.1														
Special Instructions:						Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.																		
Relinquished by: [signature]				Date/Time 4-20-22 13:00		Received by: [signature]				Date/Time 4-21-22 11:10														
Relinquished by: [signature]				Date/Time		Received by: [signature]				Date/Time														
Relinquished by: [signature]				Date/Time		Received by: [signature]				Date/Time														

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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Blank - EPA 200.7

QC Sample ID: BWD1147-BLK1		Batch: BWD1147							
Date Prepared: 04/26/2022		Date Analyzed: 04/27/2022							
Boron, Total					ND		0.05	1.00	
Calcium, Total					ND		0.2	1.00	
Magnesium, Total					ND		0.2	1.00	
Potassium, Total					ND		0.5	1.00	
Sodium, Total					ND		0.5	1.00	
QC Sample ID: BWD1267-BLK1		Batch: BWD1267							
Date Prepared: 04/29/2022		Date Analyzed: 04/29/2022							
Boron, Total					ND		0.05	1.00	
Calcium, Total					ND		0.2	1.00	
QC Sample ID: BWD1313-BLK1		Batch: BWD1313							
Date Prepared: 04/29/2022		Date Analyzed: 05/02/2022							
Boron, Total					ND		0.05	1.00	
Calcium, Total					ND		0.2	1.00	
QC Sample ID: BWE0044-BLK1		Batch: BWE0044							
Date Prepared: 05/02/2022		Date Analyzed: 05/02/2022							
Boron, Total					ND		0.05	1.00	
Calcium, Total					ND		0.2	1.00	
QC Sample ID: BWE0047-BLK1		Batch: BWE0047							
Date Prepared: 05/02/2022		Date Analyzed: 05/02/2022							
Sodium, Dissolved					ND		0.5	1.00	

LCS - EPA 200.7

QC Sample ID: BWD1147-BS1		Batch: BWD1147							
Date Prepared: 04/26/2022		Date Analyzed: 04/27/2022							
Boron, Total		97.9	85 - 115		0.49		0.500	0.05	1.00
Calcium, Total		92.3	85 - 115		9.4		10.2	0.2	1.00
Magnesium, Total		97.0	85 - 115		9.9		10.2	0.2	1.00
Potassium, Total		98.5	85 - 115		9.9		10.0	0.5	1.00
Sodium, Total		94.8	85 - 115		9.5		10.0	0.5	1.00
QC Sample ID: BWD1267-BS1		Batch: BWD1267							
Date Prepared: 04/29/2022		Date Analyzed: 04/29/2022							
Boron, Total		102	85 - 115		0.51		0.500	0.05	1.00
Calcium, Total		95.4	85 - 115		9.7		10.2	0.2	1.00
QC Sample ID: BWD1313-BS1		Batch: BWD1313							
Date Prepared: 04/29/2022		Date Analyzed: 05/02/2022							
Boron, Total		99.0	85 - 115		0.49		0.500	0.05	1.00
Calcium, Total		94.2	85 - 115		9.6		10.2	0.2	1.00
QC Sample ID: BWE0044-BS1		Batch: BWE0044							
Date Prepared: 05/02/2022		Date Analyzed: 05/02/2022							
Boron, Total		102	85 - 115		0.51		0.500	0.05	1.00
Calcium, Total		95.9	85 - 115		9.8		10.2	0.2	1.00
QC Sample ID: BWE0047-BS1		Batch: BWE0047							
Date Prepared: 05/02/2022		Date Analyzed: 05/02/2022							
Sodium, Dissolved		96.2	85 - 115		9.6		10.0	0.5	1.00

Matrix Spike - EPA 200.7

QC Sample ID: BWD1147-MS1	Batch: BWD1147	QC Source Sample: XXXXXXXX-XX
Date Prepared: 04/26/2022	Date Analyzed: 04/27/2022	

CtF WO#: 22D1554

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QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 200.7 (cont.)									
QC Sample ID: BWD1147-MS1	Batch: BWD1147		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/26/2022	Date Analyzed: 04/27/2022								
Boron, Total	96.1	70 - 130			0.61	0.13	0.500	0.05	1.00
Calcium, Total	81.5	70 - 130			70.6	62.3	10.2	0.2	1.00
Magnesium, Total	92.0	70 - 130			39.8	30.5	10.2	0.2	1.00
Potassium, Total	93.7	70 - 130			33.0	23.6	10.0	0.5	1.00
Sodium, Total	68.8	70 - 130			147	141	10.0	0.5	1.00
QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.									
QC Sample ID: BWD1147-MS2	Batch: BWD1147		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/26/2022	Date Analyzed: 04/27/2022								
Boron, Total	95.3	70 - 130			0.72	0.24	0.500	0.05	1.00
Calcium, Total	76.3	70 - 130			78.7	71.0	10.2	0.2	1.00
Magnesium, Total	89.7	70 - 130			39.4	30.2	10.2	0.2	1.00
Potassium, Total	96.7	70 - 130			17.4	7.7	10.0	0.5	1.00
Sodium, Total	76.1	70 - 130			57.3	49.7	10.0	0.5	1.00
QC Sample ID: BWD1267-MS1	Batch: BWD1267		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 04/29/2022								
Boron, Total	104	70 - 130			0.63	0.11	0.500	0.05	1.00
Calcium, Total	96.5	70 - 130			17.9	8.1	10.2	0.2	1.00
QC Sample ID: BWD1267-MS2	Batch: BWD1267		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 04/29/2022								
Boron, Total	101	70 - 130			0.59	0.08	0.500	0.05	1.00
Calcium, Total	92.7	70 - 130			61.5	52.1	10.2	0.2	1.00
QC Sample ID: BWD1267-MS3	Batch: BWD1267		QC Source Sample: 22D1554-01						
Date Prepared: 04/29/2022	Date Analyzed: 04/29/2022								
Boron, Total	96.9	70 - 130			1.19	0.71	0.500	0.05	1.00
Calcium, Total	93.0	70 - 130			21.9	12.4	10.2	0.2	1.00
QC Sample ID: BWD1313-MS1	Batch: BWD1313		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 05/02/2022								
Boron, Total	94.7	70 - 130			0.82	0.35	0.500	0.05	1.00
Calcium, Total	91.6	70 - 130			14.7	5.4	10.2	0.2	1.00
QC Sample ID: BWD1313-MS2	Batch: BWD1313		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 05/02/2022								
Boron, Total	101	70 - 130			0.64	0.13	0.500	0.05	1.00
Calcium, Total	100	70 - 130			62.9	52.6	10.2	0.2	1.00
QC Sample ID: BWE0044-MS1	Batch: BWE0044		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022								
Boron, Total	104	70 - 130			0.56	0.04	0.500	0.05	1.00
Calcium, Total	84.6	70 - 130			84.8	76.2	10.2	0.2	1.00
QC Sample ID: BWE0044-MS2	Batch: BWE0044		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022								
Boron, Total	99.1	70 - 130			0.88	0.38	0.500	0.05	1.00
Calcium, Total	75.3	70 - 130			69.9	62.2	10.2	0.2	1.00
QC Sample ID: BWE0047-MS1	Batch: BWE0047		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022								
Sodium, Dissolved	89.4	70 - 130			52.1	43.2	10.0	0.5	1.00

QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Matrix Spike - EPA 200.7 (cont.)

QC Sample ID: BWE0047-MS2	Batch: BWE0047	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022							
Sodium, Dissolved	99.2	70 - 130	15.4	5.5	10.0	0.5	1.00	

Matrix Spike Dup - EPA 200.7

QC Sample ID: BWD1147-MSD1	Batch: BWD1147		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/26/2022	Date Analyzed: 04/27/2022								
Boron, Total	98.7	2.13	70 - 130	20	0.62	0.13	0.500	0.05	1.00
Calcium, Total	92.5	1.57	70 - 130	20	71.7	62.3	10.2	0.2	1.00
Magnesium, Total	98.8	1.72	70 - 130	20	40.5	30.5	10.2	0.2	1.00
Potassium, Total	99.7	1.81	70 - 130	20	33.6	23.6	10.0	0.5	1.00
Sodium, Total	91.3	1.52	70 - 130	20	150	141	10.0	0.5	1.00

QC Sample ID: BWD1147-MSD2	Batch: BWD1147		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/26/2022	Date Analyzed: 04/27/2022								
Boron, Total	97.1	1.19	70 - 130	20	0.73	0.24	0.500	0.05	1.00
Calcium, Total	83.9	0.980	70 - 130	20	79.5	71.0	10.2	0.2	1.00
Magnesium, Total	93.5	0.974	70 - 130	20	39.8	30.2	10.2	0.2	1.00
Potassium, Total	98.7	1.13	70 - 130	20	17.6	7.7	10.0	0.5	1.00
Sodium, Total	84.1	1.39	70 - 130	20	58.1	49.7	10.0	0.5	1.00

QC Sample ID: BWD1267-MSD1	Batch: BWD1267		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 04/29/2022								
Boron, Total	103	0.111	70 - 130	20	0.63	0.11	0.500	0.05	1.00
Calcium, Total	96.5	0.00391	70 - 130	20	17.9	8.1	10.2	0.2	1.00

QC Sample ID: BWD1267-MSD2	Batch: BWD1267		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 04/29/2022								
Boron, Total	101	0.0851	70 - 130	20	0.59	0.08	0.500	0.05	1.00
Calcium, Total	87.3	0.902	70 - 130	20	61.0	52.1	10.2	0.2	1.00

QC Sample ID: BWD1267-MSD3	Batch: BWD1267		QC Source Sample: 22D1554-01						
Date Prepared: 04/29/2022	Date Analyzed: 04/29/2022								
Boron, Total	94.6	0.960	70 - 130	20	1.18	0.71	0.500	0.05	1.00
Calcium, Total	90.0	1.40	70 - 130	20	21.6	12.4	10.2	0.2	1.00

QC Sample ID: BWD1313-MSD1	Batch: BWD1313		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 05/02/2022								
Boron, Total	97.6	1.76	70 - 130	20	0.84	0.35	0.500	0.05	1.00
Calcium, Total	94.1	1.74	70 - 130	20	15.0	5.4	10.2	0.2	1.00

QC Sample ID: BWD1313-MSD2	Batch: BWD1313		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/29/2022	Date Analyzed: 05/02/2022								
Boron, Total	102	0.689	70 - 130	20	0.64	0.13	0.500	0.05	1.00
Calcium, Total	105	0.694	70 - 130	20	63.3	52.6	10.2	0.2	1.00

QC Sample ID: BWE0044-MSD1	Batch: BWE0044		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022								
Boron, Total	105	0.874	70 - 130	20	0.56	0.04	0.500	0.05	1.00
Calcium, Total	88.3	0.441	70 - 130	20	85.2	76.2	10.2	0.2	1.00

QC Sample ID: BWE0044-MSD2	Batch: BWE0044		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022								
Boron, Total	99.5	0.216	70 - 130	20	0.88	0.38	0.500	0.05	1.00
Calcium, Total	75.9	0.0871	70 - 130	20	69.9	62.2	10.2	0.2	1.00

QC Sample ID: BWE0047-MSD1	Batch: BWE0047	QC Source Sample: XXXXXXXX-XX
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022	

QC Report for Work Order (WO) - 22D1554

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Matrix Spike Dup - EPA 200.7 (cont.)

QC Sample ID: BWE0047-MSD1	Batch: BWE0047		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022								
Sodium, Dissolved	91.2	0.354	70 - 130	20	52.3	43.2	10.0	0.5	1.00
QC Sample ID: BWE0047-MSD2	Batch: BWE0047		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/02/2022	Date Analyzed: 05/02/2022								
Sodium, Dissolved	97.9	0.881	70 - 130	20	15.3	5.5	10.0	0.5	1.00

QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Blank - EPA 300.0

QC Sample ID: BWD0988-BLK1		Batch: BWD0988							
Date Prepared: 04/23/2022		Date Analyzed: 04/23/2022							
Chloride					ND			1.0	1.00
Fluoride					ND			0.1	1.00
Sulfate					ND			1.0	1.00
QC Sample ID: BWD1031-BLK1		Batch: BWD1031							
Date Prepared: 04/25/2022		Date Analyzed: 04/25/2022							
Chloride					ND			1.0	1.00
Sulfate					ND			1.0	1.00
QC Sample ID: BWE0177-BLK1		Batch: BWE0177							
Date Prepared: 05/04/2022		Date Analyzed: 05/05/2022							
Chloride					ND			1.0	1.00
Fluoride					ND			0.1	1.00
Sulfate					ND			1.0	1.00
QC Sample ID: BWE1085-BLK1		Batch: BWE1085							
Date Prepared: 05/11/2022		Date Analyzed: 05/11/2022							
Fluoride					ND			0.1	1.00

LCS - EPA 300.0

QC Sample ID: BWD0988-BS1		Batch: BWD0988							
Date Prepared: 04/23/2022		Date Analyzed: 04/23/2022							
Chloride		99.3	90 - 110		49.6		50.0	1.0	1.00
Fluoride		99.2	90 - 110		5.0		5.00	0.1	1.00
Sulfate		98.2	90 - 110		49.1		50.0	1.0	1.00
QC Sample ID: BWD1031-BS1		Batch: BWD1031							
Date Prepared: 04/25/2022		Date Analyzed: 04/25/2022							
Chloride		93.9	90 - 110		47.0		50.0	1.0	1.00
Sulfate		92.4	90 - 110		46.2		50.0	1.0	1.00
QC Sample ID: BWE0177-BS1		Batch: BWE0177							
Date Prepared: 05/04/2022		Date Analyzed: 05/05/2022							
Chloride		94.5	90 - 110		47.3		50.0	1.0	1.00
Fluoride		94.2	90 - 110		4.7		5.00	0.1	1.00
Sulfate		97.3	90 - 110		48.7		50.0	1.0	1.00
QC Sample ID: BWE1085-BS1		Batch: BWE1085							
Date Prepared: 05/11/2022		Date Analyzed: 05/11/2022							
Fluoride		99.3	90 - 110		5.0		5.00	0.1	1.00

Matrix Spike - EPA 300.0

QC Sample ID: BWD0988-MS1		Batch: BWD0988		QC Source Sample: XXXXXXXX-XX				
Date Prepared: 04/23/2022		Date Analyzed: 04/23/2022						
Chloride	91.5	80 - 120	1020	100	1000	110	1.00	
Fluoride	70.5	80 - 120	70.5	ND	100	11.0	1.00	
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.								
Sulfate	96.4	80 - 120	10900	9900	1000	110	1.00	
QC Sample ID: BWD0988-MS2		Batch: BWD0988		QC Source Sample: 22D1554-01				
Date Prepared: 04/23/2022		Date Analyzed: 04/23/2022						
Chloride	94.2	80 - 120	942	ND	1000	110	1.00	
Fluoride	86.3	80 - 120	86.3	ND	100	11.0	1.00	

QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Matrix Spike - EPA 300.0 (cont.)

QC Sample ID: BWD0988-MS2	Batch: BWD0988	QC Source Sample: 22D1554-01					
Date Prepared: 04/23/2022	Date Analyzed: 04/23/2022						
Sulfate	89.8	80 - 120	1180	281	1000	110	1.00
QC Sample ID: BWD1031-MS1	Batch: BWD1031	QC Source Sample: XXXXXXXX-XX					
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022						
Chloride	94.6	80 - 120	16.7	6.2	11.1	1.1	1.00
Sulfate	92.9	80 - 120	22.1	11.8	11.1	1.1	1.00
QC Sample ID: BWD1031-MS2	Batch: BWD1031	QC Source Sample: XXXXXXXX-XX					
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022						
Chloride	94.9	80 - 120	20.7	10.2	11.1	1.1	1.00
Sulfate	94.3	80 - 120	32.8	22.3	11.1	1.1	1.00
QC Sample ID: BWE0177-MS1	Batch: BWE0177	QC Source Sample: XXXXXXXX-XX					
Date Prepared: 05/04/2022	Date Analyzed: 05/05/2022						
Chloride	91.5	80 - 120	11.3	1.2	11.1	1.1	1.00
Fluoride	84.8	80 - 120	1.0	0.06	1.11	0.1	1.00
Sulfate	91.8	80 - 120	11.7	1.5	11.1	1.1	1.00
QC Sample ID: BWE0177-MS2	Batch: BWE0177	QC Source Sample: 22D1554-01					
Date Prepared: 05/04/2022	Date Analyzed: 05/05/2022						
Chloride	86.0	80 - 120	44.7	35.2	11.1	1.1	1.00
Fluoride	88.1	80 - 120	2.5	1.5	1.11	0.1	1.00
Sulfate		80 - 120	ND	ND	11.1	1.1	1.00
QM-05 - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The analytical batch was accepted based on the acceptable data provided by the Laboratory Control Sample(s) [LCS] and/or LCS Duplicates.							
QC Sample ID: BWE1085-MS1	Batch: BWE1085	QC Source Sample: 22D1554-02					
Date Prepared: 05/11/2022	Date Analyzed: 05/11/2022						
Fluoride	98.0	80 - 120	6.8	5.7	1.11	0.1	1.00

Matrix Spike Dup - EPA 300.0

QC Sample ID: BWD0988-MSD1	Batch: BWD0988		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/23/2022	Date Analyzed: 04/23/2022								
Chloride	93.0	1.43	80 - 120	20	1030	100	1000	110	1.00
Fluoride	75.1	6.31	80 - 120	20	75.1	ND	100	11.0	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
Sulfate	105	0.817	80 - 120	20	11000	9900	1000	110	1.00
QC Sample ID: BWD0988-MSD2	Batch: BWD0988		QC Source Sample: 22D1554-01						
Date Prepared: 04/23/2022	Date Analyzed: 04/23/2022								
Chloride	93.8	0.412	80 - 120	20	938	ND	1000	110	1.00
Fluoride	88.3	2.28	80 - 120	20	88.3	ND	100	11.0	1.00
Sulfate	89.2	0.508	80 - 120	20	1170	281	1000	110	1.00
QC Sample ID: BWD1031-MSD1	Batch: BWD1031		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Chloride	94.9	0.174	80 - 120	20	16.8	6.2	11.1	1.1	1.00
Sulfate	93.6	0.359	80 - 120	20	22.2	11.8	11.1	1.1	1.00
QC Sample ID: BWD1031-MSD2	Batch: BWD1031		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Chloride	95.9	0.535	80 - 120	20	20.8	10.2	11.1	1.1	1.00
Sulfate	95.0	0.258	80 - 120	20	32.9	22.3	11.1	1.1	1.00

QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Matrix Spike Dup - EPA 300.0 (cont.)

QC Sample ID: BWE0177-MSD1	Batch: BWE0177		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 05/04/2022	Date Analyzed: 05/05/2022								
Chloride	91.4	0.118	80 - 120	20	11.3	1.2	11.1	1.1	1.00
Fluoride	86.2	1.57	80 - 120	20	1.0	0.06	1.11	0.1	1.00
Sulfate	92.0	0.224	80 - 120	20	11.7	1.5	11.1	1.1	1.00

QC Sample ID: BWE0177-MSD2	Batch: BWE0177		QC Source Sample: 22D1554-01						
Date Prepared: 05/04/2022	Date Analyzed: 05/05/2022								
Chloride	90.2	1.03	80 - 120	20	45.2	35.2	11.1	1.1	1.00
Fluoride	94.5	2.80	80 - 120	20	2.5	1.5	1.11	0.1	1.00
Sulfate			80 - 120	20	ND	ND	11.1	1.1	1.00

QM-05 - The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. The analytical batch was accepted based on the acceptable data provided by the Laboratory Control Sample(s) [LCS] and/or LCS Duplicates.

QC Sample ID: BWE1085-MSD1	Batch: BWE1085		QC Source Sample: 22D1554-02						
Date Prepared: 05/11/2022	Date Analyzed: 05/11/2022								
Fluoride	100	0.358	80 - 120	20	6.8	5.7	1.11	0.1	1.00

QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2320 B									
QC Sample ID: BWD0952-BLK1	Batch: BWD0952								
Date Prepared: 04/22/2022	Date Analyzed: 04/22/2022								
Alkalinity - Bicarbonate (as CaCO3)					ND			1.0	1.00
Alkalinity - Carbonate (as CaCO3)					ND			1.0	1.00
Alkalinity - Hydroxide (as CaCO3)					ND			1.0	1.00
Alkalinity - Total (as CaCO3)					ND			1.0	1.00
Duplicate - SM 2320 B									
QC Sample ID: BWD0952-DUP1	Batch: BWD0952		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 04/22/2022	Date Analyzed: 04/22/2022								
Alkalinity - Bicarbonate (as CaCO3)	2.52		20	72.2	70.4			1.0	1.00
Alkalinity - Carbonate (as CaCO3)			20	ND	ND			1.0	1.00
Alkalinity - Hydroxide (as CaCO3)			20	ND	ND			1.0	1.00
Alkalinity - Total (as CaCO3)	2.52		20	72.2	70.4			1.0	1.00
LCS - SM 2320 B									
QC Sample ID: BWD0952-BS1	Batch: BWD0952								
Date Prepared: 04/22/2022	Date Analyzed: 04/22/2022								
Alkalinity - Total (as CaCO3)	95.6	90 - 110		226		236		1.0	1.00

QC Report for Work Order (WO) - 22D1554

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Blank - SM 2540 C

QC Sample ID: BWD1011-BLK1	Batch: BWD1011								
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)					ND			20	1.00
QC Sample ID: BWD1012-BLK1	Batch: BWD1012								
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BWD1013-BLK1	Batch: BWD1013								
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)					ND			10	1.00

Duplicate - SM 2540 C

QC Sample ID: BWD1011-DUP1	Batch: BWD1011	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	8	10	1920	2080				20	1.00
QC Sample ID: BWD1011-DUP2	Batch: BWD1011	QC Source Sample: 22D1554-01							
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	3	10	988	1020				20	1.00
QC Sample ID: BWD1012-DUP1	Batch: BWD1012	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	4	10	460	440				100	1.00
QC Sample ID: BWD1012-DUP2	Batch: BWD1012	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)		10	ND	892				20	1.00
QC Sample ID: BWD1013-DUP1	Batch: BWD1013	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	4	10	928	964				20	1.00
QC Sample ID: BWD1013-DUP2	Batch: BWD1013	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	6	10	484	512				20	1.00

LCS - SM 2540 C

QC Sample ID: BWD1011-BS1	Batch: BWD1011								
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	96	90 - 110		384			400	20	1.00
QC Sample ID: BWD1012-BS1	Batch: BWD1012								
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	100	90 - 110		400			400	20	1.00
QC Sample ID: BWD1013-BS1	Batch: BWD1013								
Date Prepared: 04/25/2022	Date Analyzed: 04/25/2022								
Total Dissolved Solids (TDS)	99	90 - 110		396			400	20	1.00



Well number: "QA" took from FA-UG1
Field Personnel: TK, JB
Sampling date: 4-18-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): -
Clock time of sample: 11:45
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: QA Dup
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]



Well number: BA-1161

Field Personnel: TK, JB

Sampling date: 4-19-22

Well condition: Good

Was the meter(s) calibrated prior to sampling (circle): ~~Yes~~ No

Water level, pre-pump installation (ft): *N/A*Water level, post-pump installation (ft): N/ARate & direction of groundwater flow: *N/A*

Total volume of water pumped (Liters): 1.20

Clock time of sample: 14:45

Lab's name sample(s) are being sent to: CTF

Type and size of sample bottles used: Plastic

Sample bottle(s) identification number used: BA-UG1

Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

Additional Notes:

[illegible]

[illegible]



Well number: BA-DG2
Field Personnel: TK, JB
Sampling date: 4-18-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 2.88
Clock time of sample: 14:54
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: plastic
Sample bottle(s) identification number used: BA-DG2
Was a blind sample obtained at this well (circle): Yes No

Additional Notes: _____

[illegible]



Well number: BA-DG3
Field Personnel: TK, JB
Sampling date: 4-18-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 1.50
Clock time of sample: 13:36
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: BA-DG3
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]



Well number: FA-UG1
Field Personnel: TK, JB
Sampling date: 4/18/22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 1.28
Clock time of sample: 10:31
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: FA-UG1
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]



Well number: FA - UG2

Field Personnel: TK, JB

Sampling date: 4-19-22

Well condition: Good

Was the meter(s) calibrated prior to sampling (circle): Yes No

Water level, pre-pump installation (ft): N/AWater level, post-pump installation (ft): N/ARate & direction of groundwater flow: *N/A*

Total volume of water pumped (Liters): 1.50

Clock time of sample: 8:53

Lab's name sample(s) are being sent to: CTF

Type and size of sample bottles used: Plastic

Sample bottle(s) identification number used: FA-462

Was a blind sample obtained at this well (circle): *Yes* *No*

Note: If yes, label the blind sample "CCR-QA".

Additional Notes:

[illegible]

Well number: FA-DG2
Field Personnel: TK, JB
Sampling date: 4-19-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 0.98
Clock time of sample: 10:11
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: FA-DG2
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

Additional Notes: _____

[illegible]



Well number: FA-DG3
Field Personnel: TK, JB
Sampling date: 4-20-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 0.90
Clock time of sample: 9:05
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: FA-DG3
Was a blind sample obtained at this well (circle): No Yes

Note: If yes, label the blind sample "CCR-QA".

[illegible]

[illegible]



Well number: NEP
Field Personnel: TK, JB
Sampling date: 4-18-22
Well condition: N/A
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): N/A
Clock time of sample: 16:20
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: NEP
Was a blind sample obtained at this well (circle): Yes No

Additional Notes: _____

[illegible]

(Tier 2 QC)

BILLING ADDRESS: _____
BILLING CITY/STATE/ZIP: _____
PURCHASE ORDER #: _____



TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

page 1 of 2

TESTS REQUESTED							Bacteria
	TDS	Anions: Cl, F, SO ₄	ICP Metals: B,Ca				I Coliform + E. coli (Present/Absent)
X	X	X					I Coliform + E. coli (Enumerated) (Plate Count)
X	X	X					All Only
X	X	X					
X	X	X					
X	X	X					
X	X	X					
X	X	X					
X	X	X					
X	X	X					
X	X	X					

Sample Receipt: Bottles: AQ 1171
 M 1186

☐ Custody Seals ☒ COC Complete
☒ Containers Intact ☒ Sample Volume OK
☒ COC/Labels Linked ☐ Headspace Present (VOC)
☒ Received on Ice ☐ Temp Blank
☒ Correct Containers ☒ Within Hold Time
☒ COC Included Checked by: JLV

Bottles: AQ 1170
M 1186

() Custody Seals () COC Complete
() Containers Intact () Sample Volume OK
() COC/Labels Linked () Headspace Present (VOC)
() Received on Ice () Temp Blank
() Correct Containers () Within Hold Time
() COC Included

Checked by: AP5

Checked by:

Sampled by: [print]
Trenton Keller
Special Instructions:

Sampled by: [signature]

ON ICE	NOT ON ICE	Temp (C°):
100	100	41

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: (signature)
Lt. Kelly

Date/Time 4-20-22 13:00

Received by: Signature *Quah Schuy*

Date/Time	4-20-22 13:00
-----------	---------------

Relinquished by: [signature]

Date/Time	
Date/Time	

Received by: [signature]
Received by: [signature]

Date/Time	4/21
Date/Time	

801.262.7299 PHONE
866.792.0093 FAX
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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

12 849 747 01 6399 8246

(Tier 2 QC)



COMPANY:	Deseret Power Electric Cooperative		
ADDRESS:	12500 East 25500 South		
CITY/STATE/ZIP:	Vernal, UT 84078-8525		
PHONE #:	435-781-5706	FAX	
CONTACT:	Tyler Esplin	PROJECT:	Bonanza - CCR Biannual
EMAIL:	tesplin@deseretpower.com		

BILLING ADDRESS: _____
BILLING CITY/STATE/ZIP: _____
PURCHASE ORDER #: _____

TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

Please fill out the fields highlighted in light blue.

page 2 of 2

22D1554

Lab Use Only		CLIENT SAMPLE INFORMATION																					Total Coliform	Total Coliform	HPC (Plate Count)	E. Coli Only		
		LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	Alkalinity	TDS	Anions: C	ICP Metals																		
-11	11.	NEP	4-18-22	16:20	Water		X	X	X	X																		
	2.																											
	3.																											
	4.																											
	5.																											
	6.																											
	7.																											
	8.																											
	9.																											
	10.																											
Sampled by: [print] Trenton Keller		Sampled by: [signature]		ON ICE NOT ON ICE Temp (C°): 4.1																								
Special Instructions:		Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.																										
Relinquished by: [signature]		Date/Time 4-20-22 13:00		Received by: [signature]		Date/Time 4-21-22 11:10																						
Relinquished by: [signature]		Date/Time		Received by: [signature]		Date/Time																						
Relinquished by: [signature]		Date/Time		Received by: [signature]		Date/Time																						

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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

Spring 2022 Resampling Sampling Event: July 2022



Well number: BA-DG3
Field Personnel: T Keller
Sampling date: 7-7-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 1.20
Clock time of sample: —
Lab's name sample(s) are being sent to: —
Type and size of sample bottles used: —
Sample bottle(s) identification number used: —
Was a blind sample obtained at this well (circle): Yes No

Additional Notes: _____

[illegible]

Fall 2022 Sampling Event: October 2022



10/24/2022

Work Order: 22J1060
Project: [none]

Deseret Power Electric Cooperative
Attn: Tyler Esplin
12500 East 25500 South
Vernal, UT 84078-8525

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.



Approved By:

Dave Gayer, Laboratory Director



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Certificate of Analysis

Deseret Power Electric Cooperative
Tyler Esplin
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Sample ID: FA-UG1

Matrix: Water

Date Sampled: 10/10/22 10:42

Sampled By: Trenton Keller

Lab ID: 22J1060-01

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	36.5	mg/L	1.00	EPA 300.0	10/13/22	10/14/22	
Fluoride	1.63	mg/L	0.100	EPA 300.0	10/13/22	10/14/22	
Sulfate	350	mg/L	10.0	EPA 300.0	10/13/22	10/14/22	
Total Dissolved Solids (TDS)	1040	mg/L	20	SM 2540 C	10/13/22	10/17/22	
Metals							
Boron, Total	0.79	mg/L	0.05	EPA 200.7	10/17/22	10/17/22	
Calcium, Total	7.6	mg/L	0.2	EPA 200.7	10/17/22	10/17/22	



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PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Sample ID: FA-UG2

Matrix: Water

Date Sampled: 10/11/22 10:37

Sampled By: Trenton Keller

Lab ID: 22J1060-02

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	1730	mg/L	100	EPA 300.0	10/13/22	10/14/22	
Fluoride	0.279	mg/L	0.100	EPA 300.0	10/13/22	10/14/22	
Sulfate	9360	mg/L	100	EPA 300.0	10/13/22	10/14/22	
Total Dissolved Solids (TDS)	15200	mg/L	50	SM 2540 C	10/13/22	10/17/22	
Metals							
Boron, Total	49.2	mg/L	0.50	EPA 200.7	10/17/22	10/17/22	
Calcium, Total	549	mg/L	2.0	EPA 200.7	10/17/22	10/17/22	



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PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Sample ID: FA-DG3

Matrix: Water

Date Sampled: 10/12/22 9:27

Sampled By: Trenton Keller

Lab ID: 22J1060-03

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	228	mg/L	20.0	EPA 300.0	10/13/22	10/14/22	
Fluoride	5.61	mg/L	0.100	EPA 300.0	10/13/22	10/14/22	
Sulfate	1620	mg/L	20.0	EPA 300.0	10/13/22	10/14/22	
Total Dissolved Solids (TDS)	3480	mg/L	20	SM 2540 C	10/13/22	10/17/22	
Metals							
Boron, Total	2.23	mg/L	0.05	EPA 200.7	10/17/22	10/17/22	
Calcium, Total	3.1	mg/L	0.2	EPA 200.7	10/17/22	10/17/22	



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PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Sample ID: FA-DG4

Matrix: Water

Date Sampled: 10/12/22 11:03

Sampled By: Trenton Keller

Lab ID: 22J1060-04

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	946	mg/L	10.0	EPA 300.0	10/14/22	10/15/22	
Fluoride	0.958	mg/L	0.100	EPA 300.0	10/14/22	10/15/22	
Sulfate	4150	mg/L	50.0	EPA 300.0	10/14/22	10/15/22	
Total Dissolved Solids (TDS)	8200	mg/L	50	SM 2540 C	10/13/22	10/17/22	
Metals							
Boron, Total	10.6	mg/L	0.50	EPA 200.7	10/17/22	10/17/22	
Calcium, Total	59.4	mg/L	2.0	EPA 200.7	10/17/22	10/17/22	



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PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Sample ID: BA-UG1

Matrix: Water

Date Sampled: 10/11/22 15:40

Sampled By: Trenton Keller

Lab ID: 22J1060-05

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	1510	mg/L	20.0	EPA 300.0	10/13/22	10/14/22	
Fluoride	4.69	mg/L	0.100	EPA 300.0	10/13/22	10/14/22	
Sulfate	13100	mg/L	500	EPA 300.0	10/13/22	10/14/22	
Total Dissolved Solids (TDS)	19700	mg/L	50	SM 2540 C	10/13/22	10/17/22	
Metals							
Boron, Total	146	mg/L	0.50	EPA 200.7	10/14/22	10/17/22	
Calcium, Total	431	mg/L	2.0	EPA 200.7	10/14/22	10/17/22	



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PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Sample ID: CCR - QA Dup

Matrix: Water

Date Sampled: 10/10/22 13:57

Sampled By: Trenton Keller

Lab ID: 22J1060-06

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	38.1	mg/L	1.00	EPA 300.0	10/13/22	10/14/22	
Fluoride	1.55	mg/L	0.100	EPA 300.0	10/13/22	10/14/22	
Sulfate	378	mg/L	10.0	EPA 300.0	10/13/22	10/14/22	
Total Dissolved Solids (TDS)	1010	mg/L	20	SM 2540 C	10/13/22	10/17/22	
Metals							
Boron, Total	0.64	mg/L	0.05	EPA 200.7	10/17/22	10/17/22	
Calcium, Total	12.9	mg/L	0.2	EPA 200.7	10/17/22	10/17/22	



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PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Sample ID: NEP

Matrix: Water

Date Sampled: 10/10/22 15:38

Sampled By: Trenton Keller

Lab ID: 22J1060-07

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Alkalinity - Bicarbonate (as CaCO ₃)	516	mg/L	1.0	SM 2320 B	10/14/22	10/15/22	
Alkalinity - Carbonate (as CaCO ₃)	203	mg/L	1.0	SM 2320 B	10/14/22	10/15/22	
Alkalinity - Hydroxide (as CaCO ₃)	ND	mg/L	1.0	SM 2320 B	10/14/22	10/15/22	
Alkalinity - Total (as CaCO ₃)	719	mg/L	1.0	SM 2320 B	10/14/22	10/15/22	
Chloride	3910	mg/L	500	EPA 300.0	10/13/22	10/14/22	
Fluoride	43.2	mg/L	1.00	EPA 300.0	10/13/22	10/14/22	
Sulfate	22000	mg/L	500	EPA 300.0	10/13/22	10/14/22	
Total Dissolved Solids (TDS)	36400	mg/L	100	SM 2540 C	10/13/22	10/17/22	
Metals							
Boron, Total	155	mg/L	0.50	EPA 200.7	10/14/22	10/17/22	
Calcium, Total	802	mg/L	2.0	EPA 200.7	10/14/22	10/17/22	
Magnesium, Total	3140	mg/L	2.0	EPA 200.7	10/14/22	10/17/22	
Potassium, Total	131	mg/L	5.0	EPA 200.7	10/14/22	10/17/22	
Sodium, Total	6290	mg/L	25.0	EPA 200.7	10/14/22	10/17/22	



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PO#: 172308
Receipt: 10/13/22 14:00 @ 5.3 °C
Date Reported: 10/24/2022
Project Name: [none]

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).

1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.

1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.

1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.

CHAIN OF CUSTODY

BILLING ADDRESS: _____

BILLING CITY/STATE/ZIP: _____

PURCHASE ORDER #: _____



TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

Please fill out the fields highlighted in light blue.

TESTS REQUESTED								Bacteria
	TDS	Anions: Cl, F, SO ₄	ICP Metals: B,Ca					al Coliform + E. coli (Present/Absent)
X	X	X						al Coliform + E. coli (Enumerated)
X	X	X						: (Plate Count)
X	X	X						oil Only
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						

Sample Receipt: 701-07 AQ 1233
M 1207

☐ Custody Seals
☒ Containers Intact
☒ COC/Labels Linked
☒ Received on Ice
☒ Correct Containers
☒ COC Included

☒ COC Complete
☒ Sample Volume OK
☐ Headspace Present (VOC)
☐ Temp Blank
☒ Within Hold Time
Checked by: [Signature]

Sample Receipt:

☐ Custody Seals ☒ COC Complete
☒ Containers Intact ☒ Sample Volume OK
☒ COC/Labels Linked ☐ Headspace Present (VOC)
☒ Received on Ice ☐ Temp Blank
☒ Correct Containers ☒ Within Hold Time
☒ COC Included **Checked by:**

Checked by:

ON ICE NOT ON ICE Temp (C°): 5.3

Samples received outside the EPA recommended temperature range of 0-6 C* may be rejected.

	ON ICE NOT ON ICE Temp (C°): 5.3
	Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.
Received by: (signature) Received by: (signature) Received by: (signature)	Date/Time 10-12-22 1:00 pm Date/Time 10/13/22 1400 Date/Time

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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

TRACKING #: 1Z 849 747 01 6538 3727

UPS

CHAIN OF CUSTODY

COMPANY:	Deseret Power Electric Cooperative		
ADDRESS:	12500 East 25500 South		
CITY/STATE/ZIP:	Vernal, UT 84078-8525		
PHONE #:	435-781-5706	FAX:	
CONTACT:	Tyler Esplin	PROJECT:	2022 CCR Fall Sampling
EMAIL:	tesplin@deseretpower.com		

BILLING ADDRESS: _____

BILLING CITY/STATE/ZIP: _____

PURCHASE ORDER #: _____



TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

Page 2/2

Please fill out the fields highlighted in light blue.

2 of 2

$$22 \overline{) 1060}$$

Lab Use Only	CLIENT SAMPLE INFORMATION					Alkalinity	TDS	Anions:	ICP Meta																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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CHEMTECH-FORD
9632 South 500 West
Sandy, UT 84070

801.262.7299 PHONE
866.792.0093 FAX
www.chemtechford.com

Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

QC Report for Work Order (WO) - 22J1060

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Blank - EPA 200.7

QC Sample ID: BWJ0733-BLK1	Batch: BWJ0733								
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00

QC Sample ID: BWJ0734-BLK1	Batch: BWJ0734								
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Magnesium, Total					ND			0.2	1.00
Potassium, Total					ND			0.5	1.00
Sodium, Total					ND			0.5	1.00

QC Sample ID: BWJ0781-BLK1	Batch: BWJ0781								
Date Prepared: 10/17/2022	Date Analyzed: 10/17/2022								
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00

LCS - EPA 200.7

QC Sample ID: BWJ0733-BS1	Batch: BWJ0733								
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	100	85 - 115		0.50		0.500		0.05	1.00
Calcium, Total	98.6	85 - 115		10.1		10.2		0.2	1.00

QC Sample ID: BWJ0734-BS1	Batch: BWJ0734								
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	99.9	85 - 115		0.50		0.500		0.05	1.00
Calcium, Total	98.8	85 - 115		10.1		10.2		0.2	1.00
Magnesium, Total	102	85 - 115		10.4		10.2		0.2	1.00
Potassium, Total	103	85 - 115		10.3		10.0		0.5	1.00
Sodium, Total	99.3	85 - 115		9.9		10.0		0.5	1.00

QC Sample ID: BWJ0781-BS1	Batch: BWJ0781								
Date Prepared: 10/17/2022	Date Analyzed: 10/17/2022								
Boron, Total	98.7	85 - 115		0.49		0.500		0.05	1.00
Calcium, Total	97.5	85 - 115		9.9		10.2		0.2	1.00

Matrix Spike - EPA 200.7

QC Sample ID: BWJ0733-MS1	Batch: BWJ0733	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	102	70 - 130		1.13	0.63	0.500		0.05	1.00
Calcium, Total	111	70 - 130		106	94.3	10.2		0.2	1.00

QC Sample ID: BWJ0733-MS2	Batch: BWJ0733	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	102	70 - 130		0.79	0.28	0.500		0.05	1.00
Calcium, Total	99.0	70 - 130		74.5	64.4	10.2		0.2	1.00

QC Sample ID: BWJ0734-MS1	Batch: BWJ0734	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	105	70 - 130		0.72	0.19	0.500		0.05	1.00
Calcium, Total	116	70 - 130		74.6	62.7	10.2		0.2	1.00
Magnesium, Total	110	70 - 130		34.3	23.1	10.2		0.2	1.00
Potassium, Total	111	70 - 130		35.7	24.7	10.0		0.5	1.00
Sodium, Total	127	70 - 130		132	119	10.0		0.5	1.00

QC Report for Work Order (WO) - 22J1060

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Matrix Spike - EPA 200.7 (cont.)

QC Sample ID: BWJ0734-MS2	Batch: BWJ0734	QC Source Sample: XXXXXXXX-XX					
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022						
Boron, Total	104	70 - 130	0.71	0.19	0.500	0.05	1.00
Calcium, Total	108	70 - 130	74.5	63.5	10.2	0.2	1.00
Magnesium, Total	106	70 - 130	34.1	23.3	10.2	0.2	1.00
Potassium, Total	108	70 - 130	35.9	25.1	10.0	0.5	1.00
Sodium, Total	112	70 - 130	132	121	10.0	0.5	1.00

QC Sample ID: BWJ0781-MS1	Batch: BWJ0781	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/17/2022	Date Analyzed: 10/17/2022							
Boron, Total	103	70 - 130	0.56	0.04	0.500	0.05	1.00	
Calcium, Total	81.0	70 - 130	129	121	10.2	0.2	1.00	

QC Sample ID: BWJ0781-MS2	Batch: BWJ0781	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/17/2022	Date Analyzed: 10/17/2022							
Boron, Total	103	70 - 130	0.56	0.04	0.500	0.05	1.00	
Calcium, Total	87.8	70 - 130	98.2	89.3	10.2	0.2	1.00	

Matrix Spike Dup - EPA 200.7

QC Sample ID: BWJ0733-MSD1	Batch: BWJ0733		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	99.7	0.895	70 - 130	20	1.12	0.63	0.500	0.05	1.00
Calcium, Total	97.8	1.28	70 - 130	20	104	94.3	10.2	0.2	1.00

QC Sample ID: BWJ0733-MSD2	Batch: BWJ0733		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	102	0.139	70 - 130	20	0.79	0.28	0.500	0.05	1.00
Calcium, Total	97.0	0.282	70 - 130	20	74.2	64.4	10.2	0.2	1.00

QC Sample ID: BWJ0734-MSD1	Batch: BWJ0734		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	105	0.403	70 - 130	20	0.72	0.19	0.500	0.05	1.00
Calcium, Total	113	0.467	70 - 130	20	74.3	62.7	10.2	0.2	1.00
Magnesium, Total	109	0.439	70 - 130	20	34.2	23.1	10.2	0.2	1.00
Potassium, Total	109	0.468	70 - 130	20	35.6	24.7	10.0	0.5	1.00
Sodium, Total	122	0.390	70 - 130	20	132	119	10.0	0.5	1.00

QC Sample ID: BWJ0734-MSD2	Batch: BWJ0734		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Boron, Total	103	0.892	70 - 130	20	0.70	0.19	0.500	0.05	1.00
Calcium, Total	100	1.03	70 - 130	20	73.7	63.5	10.2	0.2	1.00
Magnesium, Total	103	1.13	70 - 130	20	33.7	23.3	10.2	0.2	1.00
Potassium, Total	104	1.12	70 - 130	20	35.5	25.1	10.0	0.5	1.00
Sodium, Total	97.2	1.11	70 - 130	20	131	121	10.0	0.5	1.00

QC Sample ID: BWJ0781-MSD1	Batch: BWJ0781		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/17/2022	Date Analyzed: 10/17/2022								
Boron, Total	104	0.906	70 - 130	20	0.57	0.04	0.500	0.05	1.00
Calcium, Total	78.6	0.190	70 - 130	20	129	121	10.2	0.2	1.00

QC Sample ID: BWJ0781-MSD2	Batch: BWJ0781		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/17/2022	Date Analyzed: 10/17/2022								
Boron, Total	103	0.429	70 - 130	20	0.56	0.04	0.500	0.05	1.00
Calcium, Total	88.5	0.0687	70 - 130	20	98.3	89.3	10.2	0.2	1.00

QC Report for Work Order (WO) - 22J1060

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Blank - EPA 300.0

QC Sample ID: BWJ0687-BLK1	Batch: BWJ0687								
Date Prepared: 10/13/2022	Date Analyzed: 10/13/2022								
Chloride					ND		1.00	1.00	
Fluoride					ND		0.100	1.00	
Sulfate					ND		1.00	1.00	

QC Sample ID: BWJ0753-BLK1	Batch: BWJ0753								
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Chloride					ND		1.00	1.00	
Fluoride					ND		0.100	1.00	
Sulfate					ND		1.00	1.00	

LCS - EPA 300.0

QC Sample ID: BWJ0687-BS1	Batch: BWJ0687								
Date Prepared: 10/13/2022	Date Analyzed: 10/13/2022								
Chloride	100	90 - 110		50.2		50.0	1.00	1.00	
Fluoride	106	90 - 110		5.31		5.00	0.100	1.00	
Sulfate	100	90 - 110		50.2		50.0	1.00	1.00	

QC Sample ID: BWJ0753-BS1	Batch: BWJ0753								
Date Prepared: 10/14/2022	Date Analyzed: 10/17/2022								
Chloride	97.4	90 - 110		48.7		50.0	1.00	1.00	
Fluoride	105	90 - 110		5.25		5.00	0.100	1.00	
Sulfate	98.6	90 - 110		49.3		50.0	1.00	1.00	

Matrix Spike - EPA 300.0

QC Sample ID: BWJ0687-MS1	Batch: BWJ0687	QC Source Sample: 22J1060-01							
Date Prepared: 10/13/2022	Date Analyzed: 10/14/2022								
Chloride	96.7	80 - 120		133	36.5	100	11.0	1.00	
Fluoride	103	80 - 120		11.9	1.63	10.0	1.10	1.00	
Sulfate	104	80 - 120		455	350	100	11.0	1.00	

QC Sample ID: BWJ0687-MS2	Batch: BWJ0687	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 10/13/2022	Date Analyzed: 10/14/2022								
Chloride	118	80 - 120		255	137	100	11.0	1.00	
Fluoride	105	80 - 120		10.5	ND	10.0	1.10	1.00	
Sulfate	95.3	80 - 120		115	19.4	100	11.0	1.00	

QC Sample ID: BWJ0753-MS1	Batch: BWJ0753	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Chloride	93.1	80 - 120		104	10.7	100	11.0	1.00	
Fluoride	79.9	80 - 120		8.46	0.471	10.0	1.10	1.00	

QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.

Sulfate	92.0	80 - 120		105	12.6	100	11.0	1.00	
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QC Sample ID: BWJ0753-MS2	Batch: BWJ0753	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Chloride	90.2	80 - 120		121	30.8	100	11.0	1.00	
Fluoride	80.1	80 - 120		8.01	ND	10.0	1.10	1.00	
Sulfate	86.1	80 - 120		181	95.4	100	11.0	1.00	

Matrix Spike Dup - EPA 300.0

QC Sample ID: BWJ0687-MSD1	Batch: BWJ0687	QC Source Sample: 22J1060-01							
Date Prepared: 10/13/2022	Date Analyzed: 10/14/2022								
Chloride	94.9	1.31	80 - 120	20	131	36.5	100	11.0	1.00

QC Report for Work Order (WO) - 22J1060

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Matrix Spike Dup - EPA 300.0 (cont.)

QC Sample ID: BWJ0687-MSD1	Batch: BWJ0687		QC Source Sample: 22J1060-01						
Date Prepared: 10/13/2022	Date Analyzed: 10/14/2022								
Fluoride	100	2.21	80 - 120	20	11.7	1.63	10.0	1.10	1.00
Sulfate	100	0.924	80 - 120	20	451	350	100	11.0	1.00
QC Sample ID: BWJ0687-MSD2	Batch: BWJ0687		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/13/2022	Date Analyzed: 10/14/2022								
Chloride	112	2.37	80 - 120	20	249	137	100	11.0	1.00
Fluoride	106	1.46	80 - 120	20	10.6	ND	10.0	1.10	1.00
Sulfate	96.9	1.42	80 - 120	20	116	19.4	100	11.0	1.00
QC Sample ID: BWJ0753-MSD1	Batch: BWJ0753		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Chloride	91.3	1.67	80 - 120	20	102	10.7	100	11.0	1.00
Fluoride	79.0	1.16	80 - 120	20	8.37	0.471	10.0	1.10	1.00
QM-RPD - The recovery was outside acceptance limits for the MS and/or MSD. The RPD between the MS and MSD was acceptable and indicates the recovery is due to matrix interference. The batch was accepted based on the acceptable recovery of the LCS and the RPD.									
Sulfate	90.5	1.42	80 - 120	20	103	12.6	100	11.0	1.00
QC Sample ID: BWJ0753-MSD2	Batch: BWJ0753		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Chloride	88.9	1.10	80 - 120	20	120	30.8	100	11.0	1.00
Fluoride	78.8	1.63	80 - 120	20	7.88	ND	10.0	1.10	1.00
QM-12 - The MSD recovery was outside acceptance limits, but passed duplicate spike acceptance criteria. The batch was accepted based on the acceptability of the MS.									
Sulfate	84.7	0.759	80 - 120	20	180	95.4	100	11.0	1.00

QC Report for Work Order (WO) - 22J1060

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2320 B									
QC Sample ID: BWJ0748-BLK1	Batch: BWJ0748								
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Alkalinity - Bicarbonate (as CaCO3)					ND			1.0	1.00
Alkalinity - Carbonate (as CaCO3)					ND			1.0	1.00
Alkalinity - Hydroxide (as CaCO3)					ND			1.0	1.00
Alkalinity - Total (as CaCO3)					ND			1.0	1.00
Duplicate - SM 2320 B									
QC Sample ID: BWJ0748-DUP1	Batch: BWJ0748		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Alkalinity - Bicarbonate (as CaCO3)	0.0254		20	393	393			1.0	1.00
Alkalinity - Carbonate (as CaCO3)			20	ND	ND			1.0	1.00
Alkalinity - Hydroxide (as CaCO3)			20	ND	ND			1.0	1.00
Alkalinity - Total (as CaCO3)	0.0254		20	393	393			1.0	1.00
LCS - SM 2320 B									
QC Sample ID: BWJ0748-BS1	Batch: BWJ0748								
Date Prepared: 10/14/2022	Date Analyzed: 10/14/2022								
Alkalinity - Total (as CaCO3)	102	90 - 110		241		236		1.0	1.00

QC Report for Work Order (WO) - 22J1060

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Blank - SM 2540 C

QC Sample ID: BWJ0666-BLK1

Batch: BWJ0666

Date Prepared: 10/13/2022

Date Analyzed: 10/17/2022

Total Dissolved Solids (TDS)

ND

20

1.00

Duplicate - SM 2540 C

QC Sample ID: BWJ0666-DUP1

Batch: BWJ0666

QC Source Sample: 22J1060-01

Date Prepared: 10/13/2022

Date Analyzed: 10/17/2022

Total Dissolved Solids (TDS)

0.4

10

1040

1040

20

1.00

QC Sample ID: BWJ0666-DUP2

Batch: BWJ0666

QC Source Sample: 22J1060-02

Date Prepared: 10/13/2022

Date Analyzed: 10/17/2022

Total Dissolved Solids (TDS)

0.1

10

15200

15200

50

1.00

LCS - SM 2540 C

QC Sample ID: BWJ0666-BS1

Batch: BWJ0666

Date Prepared: 10/13/2022

Date Analyzed: 10/17/2022

Total Dissolved Solids (TDS)

101

90 - 110

404

400

20

1.00

CHAIN OF CUSTODY

BILLING ADDRESS: _____

BILLING CITY/STATE/ZIP: _____

PURCHASE ORDER #: _____



* Expedited turnaround subject to additional charge

Please fill out the fields highlighted in light blue.

TESTS REQUESTED								Bacteria
	TDS	Anions: Cl, F, SO ₄	ICP Metals: B,Ca					al Coliform + E. coli (Present/Absent)
X	X	X						al Coliform + E. coli (Enumerated)
X	X	X						: (Plate Count)
X	X	X						oil Only
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						

Sample Receipt: 7-1-07 AQ 1233
M 1207

☐ Custody Seals
☒ Containers Intact
☒ COC/Labels Linked
☒ Received on Ice
☒ Correct Containers
☒ COC Included

☒ COC Complete
☒ Sample Volume OK
☐ Headspace Present (VOC)
☐ Temp Blank
☒ Within Hold Time
Checked by: [Signature]

☐ Custody Seals ☒ COC Complete
☒ Containers Intact ☒ Sample Volume OK
☒ COC/Labels Linked ☐ Headspace Present (VOC)
☒ Received on Ice ☐ Temp Blank
☒ Correct Containers ☒ Within Hold Time
☒ COC Included **Checked by:**

Checked by:

ON ICE NOT ON ICE Temp (C°): 5.3

Samples received outside the EPA recommended temperature range of 0-6 C* may be rejected.

	ON ICE NOT ON ICE Temp (C°): 5.3
	Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.
Received by: (signature) Received by: (signature) Received by: (signature)	Date/Time Date/Time Date/Time

Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

TRACKING #: 1Z 849 747 01 6538 3727

UPC

CHAIN OF CUSTODY

COMPANY:	Deseret Power Electric Cooperative		
ADDRESS:	12500 East 25500 South		
CITY/STATE/ZIP:	Vernal, UT 84078-8525		
PHONE #:	435-781-5706	FAX:	
CONTACT:	Tyler Esplin	PROJECT:	2022 CCR Fall Sampling
EMAIL:	tesplin@deseretpower.com		

BILLING ADDRESS: _____

BILLING CITY/STATE/ZIP: _____

PURCHASE ORDER #: _____



TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

Page 2/2

Please fill out the fields highlighted in light blue.

2 of 2

$$22 \overline{) 1060}$$

Lab Use Only	CLIENT SAMPLE INFORMATION						Alkalinity	TDS	Anions:	ICP Meta										Total Coliform	Total Coliform	HPC (plate c	E. Coli Only			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine																					
07	11. NEP	10-10-22	15:38	Water		X	X	X	X																	
	2.																									
	3.																									
	4.																									
	5.																									
	6.																									
	7.																									
	8.																									
	9.																									
	10.																									
Sampled by: [print] <i>Renton Keller</i>						Sampled by: [signature] <i>[Signature]</i>					ON ICE NOT ON ICE Temp (C°):															
Special Instructions:											Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.															
Relinquished by: [signature]				Date/Time		Received by: [signature]					Date/Time															
Relinquished by: [signature]				Date/Time		Received by: [signature]					Date/Time															
Relinquished by: [signature]				Date/Time		Received by: [signature]					Date/Time															

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10/31/2022

Work Order: 22J1468
Project: 2022 CCR Fall Sampling

Deseret Power Electric Cooperative
Attn: Trenton Keller
12500 East 25500 South
Vernal, UT 84078-8525

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.



Approved By:

Dave Gayer, Laboratory Director



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Certificate of Analysis

Deseret Power Electric Cooperative
Trenton Keller
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 172308
Receipt: 10/19/22 11:15 @ 5.7 °C
Date Reported: 10/31/2022
Project Name: 2022 CCR Fall Sampling

Sample ID: FA-DG2

Matrix: Water

Date Sampled: 10/17/22 9:35

Sampled By: Trenton Keller

Lab ID: 22J1468-01

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	676	mg/L	10.0	EPA 300.0	10/19/22	10/20/22	
Fluoride	37.1	mg/L	1.00	EPA 300.0	10/19/22	10/20/22	
Sulfate	5280	mg/L	100	EPA 300.0	10/19/22	10/20/22	
Total Dissolved Solids (TDS)	12500	mg/L	50	SM 2540 C	10/20/22	10/20/22	
Metals							
Boron, Total	7.52	mg/L	0.25	EPA 200.7	10/24/22	10/24/22	
Calcium, Total	1.3	mg/L	1.0	EPA 200.7	10/24/22	10/24/22	



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Certificate of Analysis

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Trenton Keller
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 172308
Receipt: 10/19/22 11:15 @ 5.7 °C
Date Reported: 10/31/2022
Project Name: 2022 CCR Fall Sampling

Sample ID: BA-DG1

Matrix: Water

Date Sampled: 10/17/22 15:30

Sampled By: Trenton Keller

Lab ID: 22J1468-02

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	707	mg/L	50.0	EPA 300.0	10/19/22	10/20/22	
Fluoride	1.48	mg/L	0.100	EPA 300.0	10/19/22	10/20/22	
Sulfate	4860	mg/L	100	EPA 300.0	10/24/22	10/25/22	
Total Dissolved Solids (TDS)	8600	mg/L	50	SM 2540 C	10/20/22	10/20/22	
Metals							
Boron, Total	10.1	mg/L	0.50	EPA 200.7	10/21/22	10/21/22	
Calcium, Total	196	mg/L	2.0	EPA 200.7	10/21/22	10/21/22	



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Certificate of Analysis

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Trenton Keller
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 172308
Receipt: 10/19/22 11:15 @ 5.7 °C
Date Reported: 10/31/2022
Project Name: 2022 CCR Fall Sampling

Sample ID: BA-DG2

Matrix: Water

Date Sampled: 10/17/22 14:28

Sampled By: Trenton Keller

Lab ID: 22J1468-03

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	760	mg/L	10.0	EPA 300.0	10/19/22	10/20/22	
Fluoride	2.23	mg/L	0.100	EPA 300.0	10/19/22	10/20/22	
Sulfate	8080	mg/L	100	EPA 300.0	10/19/22	10/20/22	
Total Dissolved Solids (TDS)	12700	mg/L	50	SM 2540 C	10/20/22	10/20/22	
Metals							
Boron, Total	41.1	mg/L	0.50	EPA 200.7	10/21/22	10/21/22	
Calcium, Total	451	mg/L	2.0	EPA 200.7	10/21/22	10/21/22	



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Trenton Keller
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PO#: 172308
Receipt: 10/19/22 11:15 @ 5.7 °C
Date Reported: 10/31/2022
Project Name: 2022 CCR Fall Sampling

Sample ID: BA-DG3

Matrix: Water

Date Sampled: 10/17/22 13:27

Sampled By: Trenton Keller

Lab ID: 22J1468-04

	<u>Result</u>	<u>Units</u>	<u>Minimum Reporting Limit</u>	<u>Method</u>	<u>Preparation Date/Time</u>	<u>Analysis Date/Time</u>	<u>Flag(s)</u>
Inorganic							
Chloride	427	mg/L	20.0	EPA 300.0	10/19/22	10/20/22	
Fluoride	5.08	mg/L	0.100	EPA 300.0	10/19/22	10/20/22	
Sulfate	2860	mg/L	50.0	EPA 300.0	10/24/22	10/25/22	
Total Dissolved Solids (TDS)	5400	mg/L	20	SM 2540 C	10/20/22	10/20/22	
Metals							
Boron, Total	10.6	mg/L	0.50	EPA 200.7	10/21/22	10/21/22	
Calcium, Total	45.8	mg/L	2.0	EPA 200.7	10/21/22	10/21/22	



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Certificate of Analysis

Deseret Power Electric Cooperative
Trenton Keller
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 172308
Receipt: 10/19/22 11:15 @ 5.7 °C
Date Reported: 10/31/2022
Project Name: 2022 CCR Fall Sampling

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).

1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.

1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.

1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.

CHAIN OF CUSTODY

BILLING ADDRESS: _____

BILLING CITY/STATE/ZIP: _____

PURCHASE ORDER #: _____



DB

Please fill out the fields highlighted in light blue.

TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

TESTS REQUESTED										Bacteria
	TDS	Anions: Cl, F, SO4	ICP Metals: B,Ca							al Coliform + E. coli (Present/Absent)
X	X	X								al Coliform + E. coli (Enumerated) (Plate Count)
X	X	X								sl Only
X	X	X								
X	X	X								
X	X	X								
X	X	X								
X	X	X								
X	X	X								
X	X	X								
X	X	X								
X	X	X								

Sample Receipt:

☐ Custody Seals Ag 1233
☒ Containers Intact m 1207 ☒ COC Complete
☒ COC/Labels Linked ☐ Headspace Present (VOC) ☒ Sample Volume OK
☒ Received on Ice ☐ Temp Blank
☒ Correct Containers ☒ Within Hold Time
☒ COC Included Checked by: [Signature]

Sample Receipt:

() Custody Seals *Ag 1233* () COC Complete
 () Containers Intact *m 1207* () Sample Volume OK
 () COC/Labels Linked () Headspace Present (VOC)
 () Received on Ice () Temp Blank
 () Correct Containers () Within Hold Time
 () COC Included **Checked by:** *[Signature]*

Checked by:

Lab Use Only	CLIENT SAMPLE INFORMATION				
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine
	1. FA-UG1			Water	
	2. FA-UG2			Water	
-01	3. FA-DG2	10-17-22	09:25	Water	
	4. FA-DG3			Water	
	5. FA-DG4			Water	
	6. BA-UG1			Water	
-02	7. BA-DG1	10-17-22	15:30	Water	
-03	8. BA-DG2	10-17-22	14:28	Water	
-04	9. BA-DG3	10-17-22	13:27	Water	
	10. CCR - QA Dup			Water	

Sampled by: [print] Trenton Keller

Sampled by: [signature]

Special Instructions:

ON ICE NOT ON ICE Temp (C°): 5.7

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]

Date/Time 02-18-22 10:51

Received by: [signature]

Date/Time	10/18/22 10:55 AM
-----------	-------------------

Relinquished by: [signature]

Date/Time 10/10/22

Received by [signature]

Date/Time 10/18/22 1:30 pm

Relinquished by: [signature]

Date/Time 10/15/02 3:00 PM

Received by: [signature]

Date/Time 10/10/22 11:15

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Payment Terms are net 30 days OAC, 1.5% in

vps 128497470102208745

QC Report for Work Order (WO) - 22J1468

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Blank - EPA 200.7

QC Sample ID: BWJ1074-BLK1	Batch: BWJ1074								
Date Prepared: 10/21/2022	Date Analyzed: 10/21/2022								
Boron, Total			ND		0.05		1.00		
Calcium, Total			ND		0.2		1.00		

QC Sample ID: BWJ1117-BLK1	Batch: BWJ1117								
Date Prepared: 10/24/2022	Date Analyzed: 10/24/2022								
Boron, Total			ND		0.05		1.00		
Calcium, Total			ND		0.2		1.00		

LCS - EPA 200.7

QC Sample ID: BWJ1074-BS1	Batch: BWJ1074								
Date Prepared: 10/21/2022	Date Analyzed: 10/21/2022								
Boron, Total	104	85 - 115	0.52		0.500	0.05	1.00		
Calcium, Total	103	85 - 115	10.5		10.2	0.2	1.00		

QC Sample ID: BWJ1117-BS1	Batch: BWJ1117								
Date Prepared: 10/24/2022	Date Analyzed: 10/24/2022								
Boron, Total	101	85 - 115	0.51		0.500	0.05	1.00		
Calcium, Total	101	85 - 115	10.3		10.2	0.2	1.00		

Matrix Spike - EPA 200.7

QC Sample ID: BWJ1074-MS1	Batch: BWJ1074		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/21/2022	Date Analyzed: 10/21/2022								
Boron, Total	108	70 - 130	0.65		0.11	0.500	0.05	1.00	
Calcium, Total	105	70 - 130	19.2		8.4	10.2	0.2	1.00	

QC Sample ID: BWJ1074-MS2	Batch: BWJ1074		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/21/2022	Date Analyzed: 10/21/2022								
Boron, Total	103	70 - 130	0.52		ND	0.500	0.05	1.00	
Calcium, Total	102	70 - 130	10.4		0.005	10.2	0.2	1.00	

QC Sample ID: BWJ1117-MS1	Batch: BWJ1117		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/24/2022	Date Analyzed: 10/24/2022								
Boron, Total	105	70 - 130	0.58		0.05	0.500	0.05	1.00	
Calcium, Total	93.5	70 - 130	89.2		79.6	10.2	0.2	1.00	

QC Sample ID: BWJ1117-MS2	Batch: BWJ1117		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/24/2022	Date Analyzed: 10/24/2022								
Boron, Total	107	70 - 130	0.59		0.06	0.500	0.05	1.00	
Calcium, Total	96.5	70 - 130	81.6		71.7	10.2	0.2	1.00	

Matrix Spike Dup - EPA 200.7

QC Sample ID: BWJ1074-MSD1	Batch: BWJ1074		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/21/2022	Date Analyzed: 10/21/2022								
Boron, Total	105	1.95	70 - 130	20	0.64	0.11	0.500	0.05	1.00
Calcium, Total	103	1.28	70 - 130	20	18.9	8.4	10.2	0.2	1.00

QC Sample ID: BWJ1074-MSD2	Batch: BWJ1074		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/21/2022	Date Analyzed: 10/21/2022								
Boron, Total	104	0.868	70 - 130	20	0.52	ND	0.500	0.05	1.00
Calcium, Total	103	1.13	70 - 130	20	10.5	0.005	10.2	0.2	1.00

QC Sample ID: BWJ1117-MSD1	Batch: BWJ1117		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/24/2022	Date Analyzed: 10/24/2022								
Boron, Total	108	2.07	70 - 130	20	0.59	0.05	0.500	0.05	1.00
Calcium, Total	97.0	0.396	70 - 130	20	89.5	79.6	10.2	0.2	1.00

QC Report for Work Order (WO) - 22J1468

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Matrix Spike Dup - EPA 200.7 (cont.)

QC Sample ID: BWJ1117-MSD2

Batch: BWJ1117

QC Source Sample: XXXXXXXX-XX

Date Prepared: 10/24/2022

Date Analyzed: 10/24/2022

Boron, Total

106

0.577

70 - 130

20

0.59

0.06

0.500

0.05

1.00

Calcium, Total

98.1

0.200

70 - 130

20

81.7

71.7

10.2

0.2

1.00

QC Report for Work Order (WO) - 22J1468

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Blank - EPA 300.0

QC Sample ID: BWJ0939-BLK1	Batch: BWJ0939							
Date Prepared: 10/19/2022	Date Analyzed: 10/20/2022							
Chloride				ND		1.00	1.00	
Fluoride				ND		0.100	1.00	
Sulfate				ND		1.00	1.00	

QC Sample ID: BWJ1168-BLK1	Batch: BWJ1168							
Date Prepared: 10/24/2022	Date Analyzed: 10/25/2022							
Sulfate				ND		1.00	1.00	

LCS - EPA 300.0

QC Sample ID: BWJ0939-BS1	Batch: BWJ0939							
Date Prepared: 10/19/2022	Date Analyzed: 10/20/2022							
Chloride	99.4	90 - 110		49.7		50.0	1.00	1.00
Fluoride	97.7	90 - 110		4.89		5.00	0.100	1.00
Sulfate	100	90 - 110		50.1		50.0	1.00	1.00

QC Sample ID: BWJ1168-BS1	Batch: BWJ1168							
Date Prepared: 10/24/2022	Date Analyzed: 10/25/2022							
Sulfate	102	90 - 110		50.8		50.0	1.00	1.00

Matrix Spike - EPA 300.0

QC Sample ID: BWJ0939-MS1	Batch: BWJ0939	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/19/2022	Date Analyzed: 10/20/2022							
Chloride	98.2	80 - 120		10.9	ND	11.1	1.11	1.00
Fluoride	90.6	80 - 120		1.01	ND	1.11	0.111	1.00
Sulfate	92.9	80 - 120		10.3	ND	11.1	1.11	1.00

QC Sample ID: BWJ0939-MS2	Batch: BWJ0939	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/19/2022	Date Analyzed: 10/20/2022							
Chloride	98.7	80 - 120		16.1	5.14	11.1	1.11	1.00
Fluoride	93.2	80 - 120		1.49	0.455	1.11	0.111	1.00
Sulfate	105	80 - 120		58.7	47.1	11.1	1.11	1.00

QC Sample ID: BWJ1168-MS1	Batch: BWJ1168	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/24/2022	Date Analyzed: 10/25/2022							
Sulfate	116	80 - 120		18.2	5.30	11.1	1.11	1.00

QC Sample ID: BWJ1168-MS2	Batch: BWJ1168	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/24/2022	Date Analyzed: 10/25/2022							
Sulfate	104	80 - 120		24.1	12.5	11.1	1.11	1.00

Matrix Spike Dup - EPA 300.0

QC Sample ID: BWJ0939-MSD1	Batch: BWJ0939	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/19/2022	Date Analyzed: 10/20/2022							
Chloride	98.3	0.121	80 - 120	20	10.9	ND	11.1	1.11
Fluoride	89.7	1.02	80 - 120	20	0.997	ND	1.11	0.111
Sulfate	93.4	0.462	80 - 120	20	10.4	ND	11.1	1.11

QC Sample ID: BWJ0939-MSD2	Batch: BWJ0939	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/19/2022	Date Analyzed: 10/20/2022							
Chloride	100	1.11	80 - 120	20	16.3	5.14	11.1	1.11
Fluoride	94.5	1.02	80 - 120	20	1.51	0.455	1.11	0.111
Sulfate	105	0.0789	80 - 120	20	58.7	47.1	11.1	1.11

QC Sample ID: BWJ1168-MSD1	Batch: BWJ1168	QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/24/2022	Date Analyzed: 10/25/2022							

QC Report for Work Order (WO) - 22J1468

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Matrix Spike Dup - EPA 300.0 (cont.)

QC Sample ID: BWJ1168-MSD1

Batch: BWJ1168

QC Source Sample: XXXXXXXX-XX

Date Prepared: 10/24/2022

Date Analyzed: 10/25/2022

Sulfate

119

2.25

80 - 120

20

18.6

5.30

11.1

1.11

1.00

QC Sample ID: BWJ1168-MSD2

Batch: BWJ1168

QC Source Sample: XXXXXXXX-XX

Date Prepared: 10/24/2022

Date Analyzed: 10/25/2022

Sulfate

106

0.945

80 - 120

20

24.3

12.5

11.1

1.11

1.00

QC Report for Work Order (WO) - 22J1468

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2540 C									
QC Sample ID: BWJ0954-BLK1	Batch: BWJ0954								
Date Prepared: 10/20/2022	Date Analyzed: 10/20/2022								
Total Dissolved Solids (TDS)					ND			10	1.00
Duplicate - SM 2540 C									
QC Sample ID: BWJ0954-DUP1	Batch: BWJ0954		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/20/2022	Date Analyzed: 10/20/2022								
Total Dissolved Solids (TDS)	0		10	1930	1930			20	1.00
QC Sample ID: BWJ0954-DUP2	Batch: BWJ0954		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 10/20/2022	Date Analyzed: 10/20/2022								
Total Dissolved Solids (TDS)	2		10	172	176			20	1.00
LCS - SM 2540 C									
QC Sample ID: BWJ0954-BS1	Batch: BWJ0954								
Date Prepared: 10/20/2022	Date Analyzed: 10/20/2022								
Total Dissolved Solids (TDS)	99	90 - 110		396			400	20	1.00

CHAIN OF CUSTODY

BILLING ADDRESS: _____
BILLING CITY/STATE/ZIP: _____
PURCHASE ORDER #: _____



DR

TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

TESTS REQUESTED							Bacteria	
	TDS	Anions: Cl, F, SO ₄	ICP Metals: B, Ca					n) Coliform + E. coli (Present/Absent)
X	X	X						n) Coliform + E. coli (Enumerated) (Plate Count)
X	X	X						All Only
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						
X	X	X						

Sample Receipt:

☐ Custody Seals A9 1233
☒ Containers Intact M 1207 ☒ COC Complete
☒ COC/Labels Linked ☐ Headspace Present (VOC) ☒ Sample Volume OK
☒ Received on Ice ☐ Temp Blank
☒ Correct Containers ☒ Within Hold Time
☒ COC Included Checked by: [Signature]

() Custody Seals *Ag 1233* () COC Complete
 () Containers Intact *m 1207* () Sample Volume OK
 () COC/Labels Linked () Headspace Present (VOC)
 () Received on Ice () Temp Blank
 () Correct Containers () Within Hold Time
 () COC Included **Checked by:** *[Signature]*

Checked by:

Lab Use Only	CLIENT SAMPLE INFORMATION				
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine
	1. FA-UG1			Water	
	2. FA-UG2			Water	
-01	3. FA-DG2	10-17-22	09:25	Water	
	4. FA-DG3			Water	
	5. FA-DG4			Water	
	6. BA-UG1			Water	
-02	7. BA-DG1	10-17-22	15:30	Water	
-03	8. BA-DG2	10-17-22	14:28	Water	
-04	9. BA-DG3	10-17-22	13:27	Water	
	10. CCR - QA Dup			Water	

Sampled by: [print] Trenton Keller

Sampled by: [signature]

Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 5.7

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]
Relinquished by: [signature]
Relinquished by: [signature]

Date/Time 12-18-22 10:54

Received by: [signature]

Date/Time
10/18/22

Received by: Signature

Date/Time 10/18/22 3:00 PM

Received by: [signature]

Date/Time	10/18/22 10:55 AM
-----------	-------------------

Date/Time	10/18/22	1:30 PM
-----------	----------	---------

Date/Time 10/19/22 11:15

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866.792.0093 FAX
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ups 1284974701 62208745



Well number: "QA" took from FA-UG1
Field Personnel: TK, JB
Sampling date: 10-10-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): -
Clock time of sample: 13:57
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: plastic
Sample bottle(s) identification number used: CCR-QA Dup
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

Additional Notes: See FA-UG1 for info

[illegible]



Well number: BA-UG1
Field Personnel: TK, JB
Sampling date: 10-11-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): NA
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 0.90
Clock time of sample: 15:40
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: BA-UG1
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]



Well number: BA-DG1
Field Personnel: TR, JB
Sampling date: 10-17-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: NA
Total volume of water pumped (Liters): 0.90
Clock time of sample: 15:30
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: BA-DG1
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]

[illegible]



Well number: BA-DG13
Field Personnel: TK, JB
Sampling date: 10-17-12
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 1.35
Clock time of sample: 13:27
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: BA-DG13
Was a blind sample obtained at this well (circle): No Yes

Additional Notes: _____

[illegible]



Well number: FA-UG1
Field Personnel: TK, JB
Sampling date: 10-10-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 1.20
Clock time of sample: 10:42
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: FA-UG1
Was a blind sample obtained at this well (circle): Yes No
Note: If yes, label the blind sample "CCR-QA".

[illegible]

Well number: FA-UG2

Field Personnel: TK, JB

Sampling date: 10-11-22

Well condition: Good

Was the meter(s) calibrated prior to sampling (circle): Yes No

Water level, pre-pump installation (ft): N/A

Water level, post-pump installation (ft): N/A

Rate & direction of groundwater flow: N/A

Total volume of water pumped (Liters): 1.35

Clock time of sample: 10:37

Lab's name sample(s) are being sent to: CTF

Type and size of sample bottles used: Plastic

Sample bottle(s) identification number used: FA-UG2

Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

Additional Notes:

[illegible]

[illegible]



Well number: FA - DG3
Field Personnel: TK, JB
Sampling date: 10-12-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 0.90
Clock time of sample: 09:27
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: FA-DG3
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]



Well number: FA-DG 4
Field Personnel: TK, JB
Sampling date: 10-12-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 0.98
Clock time of sample: 11:03
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: Plastic
Sample bottle(s) identification number used: FA-DG 4
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]



Well number: NEP
Field Personnel: TK, JB
Sampling date: 10-10-22
Well condition: N/A
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): N/A
Clock time of sample: 15:38
Lab's name sample(s) are being sent to: CTF
Type and size of sample bottles used: plastic
Sample bottle(s) identification number used: NEP
Was a blind sample obtained at this well (circle): No Yes

Note: If yes, label the blind sample "CCR-QA".

[illegible]

CHAIN OF CUSTODY

BILLING ADDRESS: _____

BILLING CITY/STATE/ZIP: _____

PURCHASE ORDER #: _____



* Expedited turnaround subject to additional charge

Please fill out the fields highlighted in light blue.

TESTS REQUESTED						Bacteria
	TDS	Anions: Cl, F, SO ₄	ICP Metals: B,Ca			al Coliform + E. coli (Present/Absent)
X	X	X				al Coliform + E. coli (Enumerated)
X	X	X				: (Plate Count)
X	X	X				oil Only
X	X	X				
X	X	X				
X	X	X				
X	X	X				
X	X	X				
X	X	X				
X	X	X				
X	X	X				

Sample Receipt: 701-07 AQ 1233
M 1207

☐ Custody Seals
☒ Containers Intact
☒ COC/Labels Linked
☒ Received on Ice
☒ Correct Containers
☒ COC Included

☒ COC Complete
☒ Sample Volume OK
☐ Headspace Present (VOC)
☐ Temp Blank
☒ Within Hold Time
Checked by: [Signature]

☐ Custody Seals ☒ COC Complete
☒ Containers Intact ☒ Sample Volume OK
☒ COC/Labels Linked ☐ Headspace Present (VOC)
☒ Received on Ice ☐ Temp Blank
☒ Correct Containers ☒ Within Hold Time
☒ COC Included **Checked by:** 

Checked by:

ON ICE NOT ON ICE Temp (C°): 5.3

Samples received outside the EPA recommended temperature range of 0-6 C* may be rejected.

Relinquished by: [signature]	Date/Time 10-12-22 @ 12:45	Received by: [signature]	Date/Time 10-12-22 1:00 pm
Relinquished by: [signature]	Date/Time 10-12-22 3:00 pm	Received by: [signature]	Date/Time 10/13/22 1400
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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866.792.0093 FAX
www.chemtechford.com

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TRACKING #: 1Z 849 747 01 6538 3727

UPS

CHAIN OF CUSTODY

COMPANY:	Deseret Power Electric Cooperative		
ADDRESS:	12500 East 25500 South		
CITY/STATE/ZIP:	Vernal, UT 84078-8525		
PHONE #:	435-781-5706	FAX:	
CONTACT:	Tyler Esplin	PROJECT:	2022 CCR Fall Sampling
EMAIL:	tesplin@deseretpower.com		

BILLING ADDRESS: _____

BILLING CITY/STATE/ZIP: _____

PURCHASE ORDER #: _____



TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

Page 2/2

Please fill out the fields highlighted in light blue.

2 of 2

$$22 \overline{) 1060}$$

Lab Use Only	CLIENT SAMPLE INFORMATION										Alkalinity	TDS	Anions:	ICP Meta																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

CHAIN OF CUSTODY

BILLING ADDRESS: _____
BILLING CITY/STATE/ZIP: _____
PURCHASE ORDER #: _____



DR

Please fill out the fields highlighted in light blue.

TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

TESTS REQUESTED						Bacteria	
TDS						☐ Coliform + E. coli (Present/Absent)	
Anions: Cl, F, SO ₄						☐ Coliform + E. coli (Enumerated)	
ICP Metals: B, Ca						(Plate Count)	
						All Only	

Sample Receipt:

☐ Custody Seals A9 1233

☒ Containers Intact M 1207

☒ COC/Labels Linked ☐ Headspace Present (VOC)

☒ Received on Ice ☐ Temp Blank

☒ Correct Containers ☒ Within Hold Time

☒ COC Included Checked by: [Signature]

☒ COC Complete

☒ Sample Volume OK

Sample Receipt:

() Custody Seals *Ag 1233* () COC Complete
 () Containers Intact *m 1207* () Sample Volume OK
 () COC/Labels Linked () Headspace Present (VOC)
 () Received on Ice () Temp Blank
 () Correct Containers () Within Hold Time
 () COC Included **Checked by:** *[Signature]*

Checked by:

Lab Use Only	CLIENT SAMPLE INFORMATION				
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine
	1. FA-UG1			Water	
	2. FA-UG2			Water	
-01	3. FA-DG2	10-17-22	09:25	Water	
	4. FA-DG3			Water	
	5. FA-DG4			Water	
	6. BA-UG1			Water	
-02	7. BA-DG1	10-17-22	15:30	Water	
-03	8. BA-DG2	10-17-22	14:28	Water	
-04	9. BA-DG3	10-17-22	13:27	Water	
	10. CCR - QA Dup			Water	

Sampled by: [print] Trenton Keller

Sampled by: [signature]

Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 5.7

Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.

Relinquished by: [signature]

Date/Time

10-18-22 10:54

Received by: [signature]

Received by [signature]

Received by: [signature]

Date/Time

10/18/22 10:55 AM

Date/Time

Date/Time

CHEMTECH-FORD
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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

ups 12849747016220845

Fall 2022 Resampling Event: December 2022



Well number: BA-DC41
Field Personnel: TK JB
Sampling date: 12-6-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): - N/A
Water level, post-pump installation (ft): - N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): _____
Clock time of sample: N/A
Lab's name sample(s) are being sent to: N/A
Type and size of sample bottles used: N/A
Sample bottle(s) identification number used: _____
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

[illegible]



Well number: BA-DG2
Field Personnel: TK JTB
Sampling date: 12-6-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 1.13
Clock time of sample: N/A
Lab's name sample(s) are being sent to: N/A
Type and size of sample bottles used: N/A
Sample bottle(s) identification number used: N/A
Was a blind sample obtained at this well (circle): Yes No

Additional Notes: _____

[illegible]

Well number: BA-DG3
Field Personnel: TR
Sampling date: 12-7-22
Well condition: Good
Was the meter(s) calibrated prior to sampling (circle): Yes No
Water level, pre-pump installation (ft): N/A
Water level, post-pump installation (ft): N/A
Rate & direction of groundwater flow: N/A
Total volume of water pumped (Liters): 1.20
Clock time of sample: NA
Lab's name sample(s) are being sent to: N/A
Type and size of sample bottles used: N/A
Sample bottle(s) identification number used: N/A
Was a blind sample obtained at this well (circle): Yes No

Note: If yes, label the blind sample "CCR-QA".

Additional Notes: _____

[illegible]

Appendix B

Alternative Source Demonstrations (ASD), Bottom Ash Area Landfill, Bonanza Power Plant

Fall 2021 Alternative Source Demonstration (ASD)

Technical Memorandum

To: Tyler Esplin, Deseret Power Electric Cooperative
From: Dale Kolstad, P.E., Barr Engineering Co.
Subject: Fall 2021 Monitoring Event Alternative Source Demonstration (ASD), Bonanza Power Plant
Date: May 4, 2022
Project: 44241001.07 Bonanza Power Plant CCR

1.0 Introduction

Deseret Power Electric Cooperative, Bonanza Power near Vernal, UT, has implemented a Detection Monitoring Program in accordance with the U.S. Environmental Protection Agency (EPA) Coal Combustion Residuals (CCR) Rule (40 CFR Parts 257 and 261).

The fall 2021 detection monitoring event occurred on October 18-20, 2021. Statistically significant increases (SSI) were identified for the fluoride concentration at well FA-DG4 at the Fly Ash (FA) Landfill Area and for pH at well BA-DG3 at the Bottom Ash (BA) Landfill Area. The final laboratory report was received on November 8, 2021. Verification resampling was conducted on October 27, 2021, to verify the BA-DG3 pH SSI. No resampling was conducted for the FA-DG4 fluoride SSI based on previous work that demonstrated that a source other than the FA Landfill, natural spatial variability, and naturally-occurring variation in fluoride concentrations at the site and in the region. An SSI determination memo was prepared on February 4, 2022.

1.1 Purpose

This memorandum is intended to provide written documentation of a FA Landfill Area-wide Alternative Source Demonstration (ASD) for fluoride (at all FA downgradient wells including at FA-DG4) and a well-specific ASD for pH in well BA-DG3. It also provides a certification of accuracy for these ASDs as described in the CCR Rule (§257.94(e)(2)).

1.2 Background Information

Figure 1 shows the location of FA-DG2, FA-DG3, and FA-DG4 and the North Evaporation Pond (NEP). The conceptual model for the site (Figure 1) consists of groundwater flowing from the northwest under the FA Area toward the south. The NEP is a non-CCR pond that receives process water from the plant. The NEP has an earthen liner that limits infiltration but allows seepage so that water in the pond combines with upgradient groundwater under the FA Landfill. The groundwater flow is controlled by a groundwater capture system that is located downgradient of the FA Landfill Area monitoring wells. Therefore, groundwater quality in the FA Landfill Area downgradient monitoring wells is influenced by the water quality in the NEP. Details on the network and conceptual model of groundwater flow are included in the

Groundwater Monitoring System Certification (Burns and McDonnell, 2017) and the Annual Review of Groundwater Levels (Loughlin, 2020).

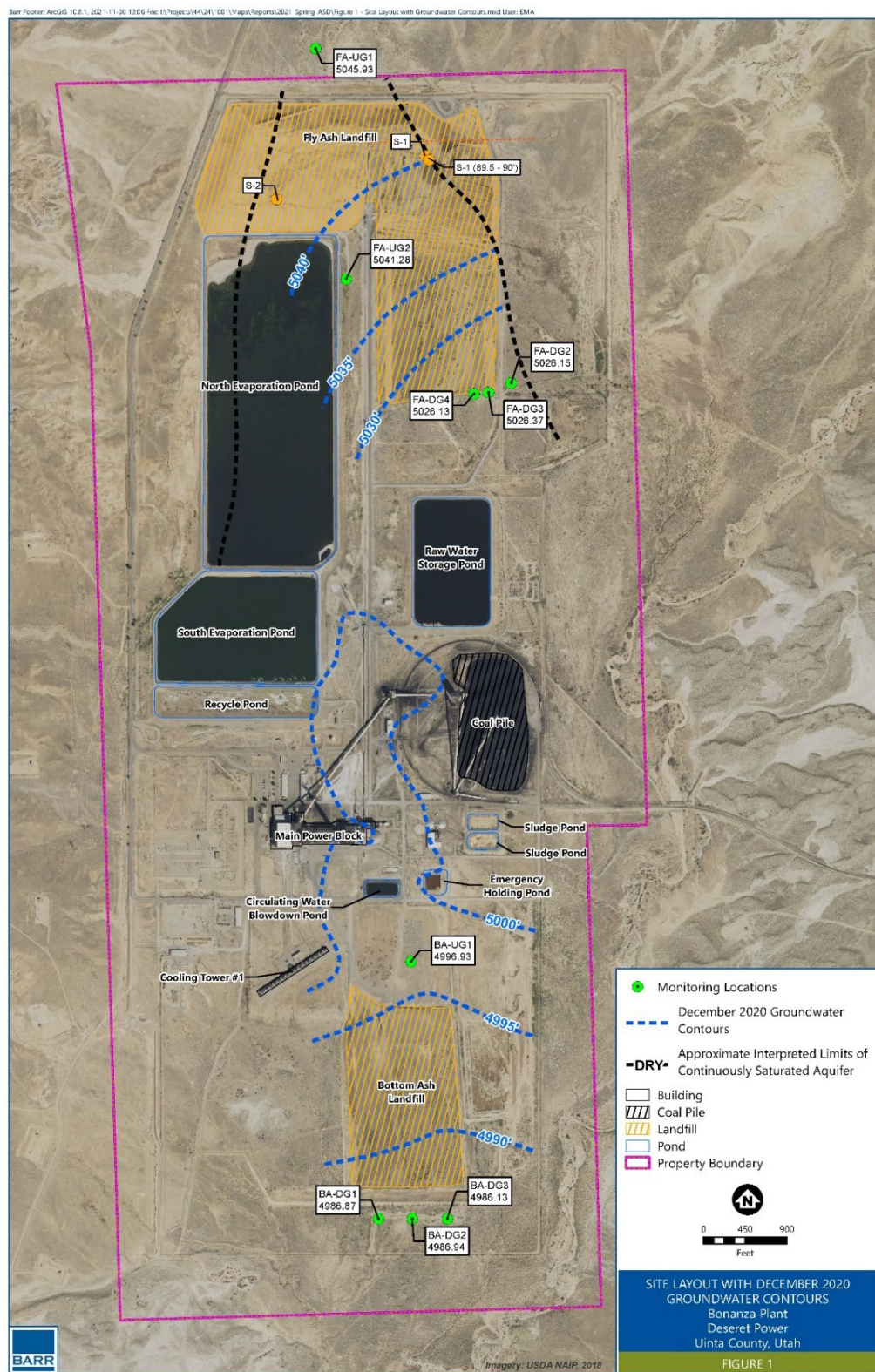


Figure 1 Site Layout with October 2020 Groundwater Contours

A comparison of the fall 2021 groundwater results with the prediction limits calculated using the baseline data is included in Table 1. The EPA's Unified Guidance (USEPA, 2009) notes that parametric prediction limits can be computed using as few as three normally distributed background samples, though a minimum of eight is advised. Six samples have been collected from the NEP; two each in 2018, 2020, and 2021. The data were found to be normally distributed and were used to calculate a parametric prediction limit for fluoride. No prediction limit was calculated for pH from the NEP because the NEP is located adjacent to the FA Landfill but is spatially and hydraulically distant from the BA Landfill.

Table 1 Comparison of SSI Parameters with Prediction Limits and NEP Concentrations

Well	Parameter (units)	Measured	Resample	InterPL	IntraPL	NEP PL
FA-DG4	Fluoride (mg/L)	4.7	n/a	1.9	2.8	107
BA-DG3	pH	8.0	7.9	7.0 – 7.3	7.0 – 7.7*	n/a

PL: Prediction Limit

*Intrawell prediction limit may not be appropriate due to trending data.

Previous ASDs were completed for FA-DG4 for fluoride (Barr, 2019; Barr, 2020a; Barr, 2020b, Barr 2021) that concluded that the fluoride was due to a source other than the FA Landfill and identified the NEP as a potential source along with natural variability as shown by both regional and site geochemical data. This ASD reinforces the findings of those earlier ASDs and provides additional information that supports a FA Landfill area-wide ASD that will be included by reference to address potential future fluoride SSIs should they occur at FA-DG4 or other FA Landfill downgradient monitoring wells.

1.3 Rule Requirements

The requirements for written documentation and certification of accuracy for an ASD are included in §257.94(e) (2):

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report.

In accordance with the above requirement, this memorandum is being issued within 90 days of the SSI determination (February 4, 2022).

1.4 Potential Alternative Sources Review

Based on the rule (above), there are five categories that we evaluated for this ASD. These include:

1. A source other than the CCR unit
2. Sampling (or sampling equipment) methods

3. Laboratory methods
4. Statistical methods
5. Natural variation in groundwater quality

2.0 Lines of Evidence Supporting an ASD: Fluoride at FA-DG4

As part of the ASD, site data was evaluated to identify potential causes for elevated fluoride concentrations in the FA-DG4 monitoring well. The following potential sources were selected for investigation:

- Surface water data from the NEP
- Natural variation
- Results of laboratory analysis on CCR material collected from the FA Landfill

A hypothesis was developed to evaluate each of the potential alternatives for the SSIs included in the rule and then tested against available data to determine if site data support the hypothesis as described in the following sections.

2.1 A “source other than the CCR unit” (North Evaporation Pond)

Groundwater flows from under the NEP toward the FA Landfill downgradient monitoring wells as shown on Figure 1.

- Hypothesis: The NEP, which is a non-CCR unit, is the source of elevated dissolved constituents contributing to the SSI for fluoride in the FA-DG4 monitoring well.
- Analysis: Data collected from the pond in 2018 (Barr, 2020a), 2020 (Barr, 2020b), and 2021 (Barr, 2022) were compared to the groundwater concentrations. A mixing model of concentrations from upgradient monitoring well FA-UG1 and the NEP was used to evaluate whether the NEP could be a source.
- Result: Concentrations in the NEP were much higher than in the downgradient monitoring well. The concentrations in FA-DG4 are similar to what would be expected if waters from the NEP and upgradient were mixing. The NEP is therefore a likely source of the SSIs.

Figure 2 shows a time-series plot of fluoride concentrations in FA-DG4 collected under the CCR Rule. Dashed lines on the plot indicate the intrawell prediction limit for FA-DG4, the interwell prediction limit calculated from concentrations in FA-UG1 and FA-UG2 (PZ-11), and the interwell prediction limit calculated from the concentrations in the NEP. The prediction limit from the NEP (75.2 mg/L) was much higher than the concentration in FA-DG4 (4.7 mg/L). The higher concentrations in the NEP suggest that it is a source of fluoride to downgradient wells.

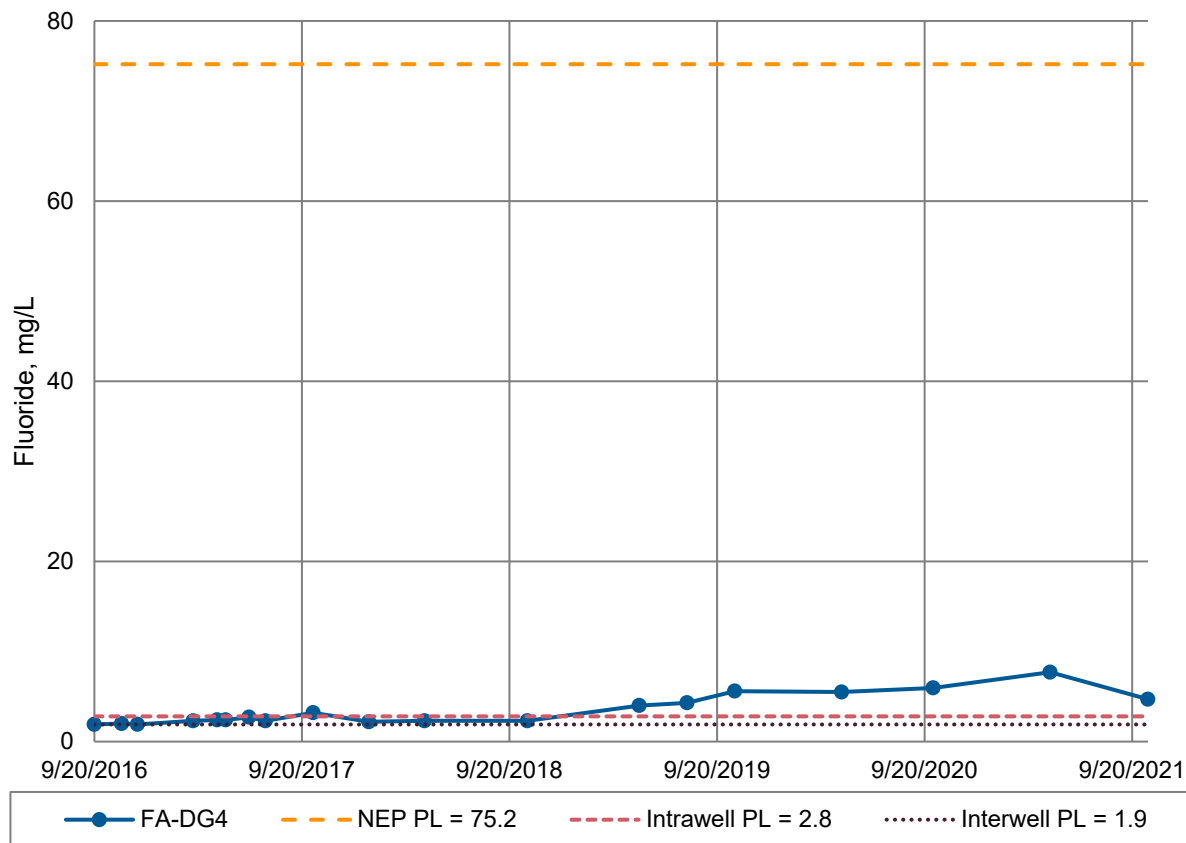


Figure 2 Time-series Plot of Fluoride Concentration in FA-DG4

To further test the hypothesis, the geochemical modeling software The Geochemist's Workbench (Aqueous Solutions LLC, Champaign, IL) was used to model what the composition of a water would be if it was the result of the mixing of waters from an upgradient well (represented by groundwater from FA-UG1) and the NEP. The model used groundwater concentrations measured in April 2018, the most recent available data that include the major ions bicarbonate (alkalinity), magnesium, potassium, and sodium. The model calculated incremental concentrations at every percentage combination (i.e., 100% FA-UG1 and 0% NEP through 100% NEP and 0% FA-UG1). The model accounted for formation of common minerals and predicted that calcite (CaCO_3), magnesite (MgCO_3), and fluorite (CaF_2) can be formed depending upon the mixing ratio.

Figure 3 shows the mixing model results on a Piper plot, along with the original 2018 compositions of the upgradient well, NEP samples, and FA-DG4 (Barr, 2019). The mixing model results indicate that a water similar in composition (i.e., values that are located near the predicted results on the Piper Plot) to the FA-DG4 sample could result from the mixing of waters from the NEP and upgradient wells. This is indicated by the position of the sample for FA-DG4, shown by the dark blue triangle, which plots close to the mixing path about halfway between the NEP samples and the upgradient groundwater sample on Figure 3. This indicates that values observed at FA-DG4 are consistent with the hypothesis that downgradient groundwater can be explained by the contribution of fluoride by the NEP.

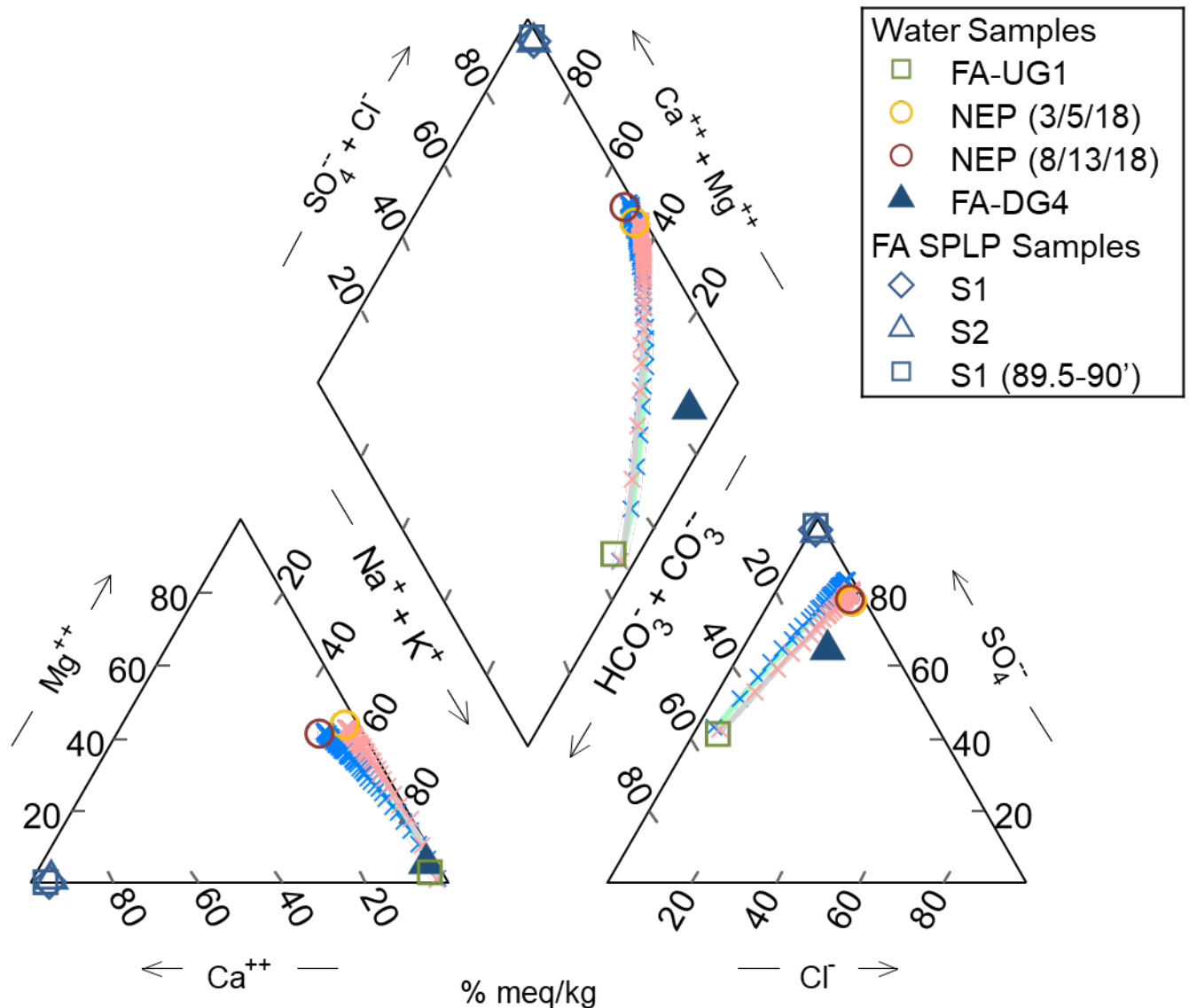


Figure 3 Piper Plot of Mixing Model Results

2.2 A “source other than the CCR unit” (inconsistent with CCR Unit)

- Hypothesis: Groundwater samples from FA-DG4 should have chemical signatures similar to fly ash leachate if the impacts were the result of leaching from the CCR unit.
- Analysis: Synthetic precipitation leaching procedure (SPLP) tests were performed on samples collected from borings advanced into the CCR unit, and the resulting samples were analyzed for major and CCR parameters.
- Result: The CCR material in the FA Landfill has a different composition than what would be expected if it were the source of a release affecting FA-DG4 based on the SPLP analysis designed to simulate leaching.

Borings were advanced within the Fly Ash Landfill in December 2019 at the locations shown on Figure 1. Composite samples from the CCR material were collected from several intervals between the surface and the bottom of the borings (90 feet below the surface) at locations S1 and S2. A grab sample from the bottom of boring S1 (89.5 to 90 feet below the surface) was also collected to represent ash from a previously closed non-CCR unit within the landfill footprint. These three samples were leached using the Synthetic Precipitation Leaching Procedure (SPLP), in which the samples were mixed with a slightly acidic solution designed to simulate rainwater that might percolate through the ash. The liquid from this procedure was analyzed for the same parameters used to evaluate groundwater. The results of the analysis were included in Table 2 and Attachment A of the Fall 2019 ASD (Barr, 2020a).

The major ion compositions of the SPLP leachate samples are shown on the Piper plot in Figure 3, which also shows samples from FA-UG1 and FA-DG4. The plot indicates that the SPLP samples from S1, S2, and S1 (89.5-90') have very similar compositions but are very different from the composition of the sample collected from downgradient monitoring well FA-DG4. In particular, the sample from FA-DG4 has sodium as the dominant cation ($\text{Na} > \text{Mg} > \text{Ca}$), whereas the SPLP samples exhibit calcium as the dominant cation ($\text{Ca} > \text{Na} > \text{Mg}$).

Fluoride concentrations in the SPLP samples were measured at less than 0.4 mg/L, whereas the fluoride concentrations that have been measured in FA-DG4 range from 1.9 to 7.7 mg/L. Although absolute concentrations may not be comparable between groundwater samples and SPLP leachate, fluoride makes up approximately 0.1% of the total anionic charge concentration in the FA-DG4 sample, whereas fluoride comprises only 0.03 to 0.06% of the anionic charge in the SPLP samples. The relative lack of fluoride in the SPLP samples means that the CCR unit is unlikely to be the source of fluoride to groundwater responsible for previous SSIs. These data refute the hypothesis that the release is due to the CCR unit.

2.3 Natural variation

- Hypothesis: Natural variation in fluoride concentrations within native geology at the site and in the region contributes to the elevated fluoride concentrations observed in FA-DG4.
- Analysis: Fluoride concentrations in all wells within the groundwater monitoring network were evaluated using publicly available data and published studies of regional geology and groundwater chemistry. A simple geochemical model for dissolution/precipitation of minerals helps explain the observed differences across the site in fluoride concentrations.
- Result: Fluoride concentrations in site wells and regionally vary widely due to the geology of the region and are likely to be affected by geochemical processes expected from interaction with the mineralogy of the subsurface. Therefore, natural variation is likely a significant cause of the SSI observed in FA-DG4.

Table 2 Synthetic Precipitation Leaching Procedure Results, Deseret Power Bonanza Plant

Location Depth Date	S1 89.5 - 90 ft 12/17/2019	S1 0 - 90 ft 12/17/2019	S2 0 - 90 ft 12/17/2019
Parameter [mg/l unless otherwise noted]			
SPLP General Parameters			
Alkalinity, Bicarbonate, as CaCO ₃ (reprep)	26.0	25.0	20.0
Alkalinity, Carbonate as CaCO ₃ (reprep)	< 10.0	12.0	20.0
Alkalinity, Hydroxide as CaCO ₃ (reprep)	< 10.0	< 10.0	< 10.0
Alkalinity, Total, as CaCO ₃ (reprep)	30.0	37.0	40.0
Chloride	3.05	8.93	11.4
Fluoride	0.185	0.288	0.380
pH (reprep) [pH units]	8.59	8.65	9.19
Sulfate	1,500	1,500	1,580
SPLP Metals			
Antimony	< 0.0300	< 0.0300	< 0.0300
Arsenic	< 0.0200	< 0.0200	< 0.0200
Beryllium	< 0.0100	< 0.0100	< 0.0100
Boron	0.554	1.00	2.00
Cadmium	< 0.00350	< 0.00350	< 0.00350
Calcium	652	622	656
Calcium (reprep)	708	633	677
Chromium	< 0.100	< 0.100	< 0.100
Cobalt	< 0.0200	< 0.0200	< 0.0200
Lead	< 0.0100	< 0.0100	< 0.0100
Lithium	< 0.100	< 0.100	< 0.100
Magnesium	< 1.00	1.15	5.15
Mercury	< 0.00100	< 0.00100	< 0.00100
Molybdenum	0.322	0.0623	0.104
Potassium	< 1.00	1.24	1.45
Selenium	0.0137	< 0.0100	0.0306
Sodium	24.6	27.1	30.9
Thallium	< 0.0100	< 0.0100	< 0.0100

As shown on Figure 4, the fluoride concentrations in site wells vary by approximately an order of magnitude. The concentration is lowest in the upgradient fly ash wells (averages of 1.8 and 0.6 mg/L in FA-UG1 and FA-UG2, respectively) and are the highest in FA-DG2 (average of 59 mg/L). Average concentrations in the other downgradient wells (FA-DG2 and FA-DG3) exceed the fluoride concentrations measured in FA-DG4 (Figure 4). Because other wells at the site had higher concentrations of fluoride that were not indicative of an SSI, it is concluded that there is high variability in fluoride concentrations in the area.

To test the hypothesis of natural variation as an explanation for the concentrations at FA-DG4, evidence of natural sources of fluoride and/or plausible explanations for the differences in concentrations between downgradient wells were evaluated as described below.

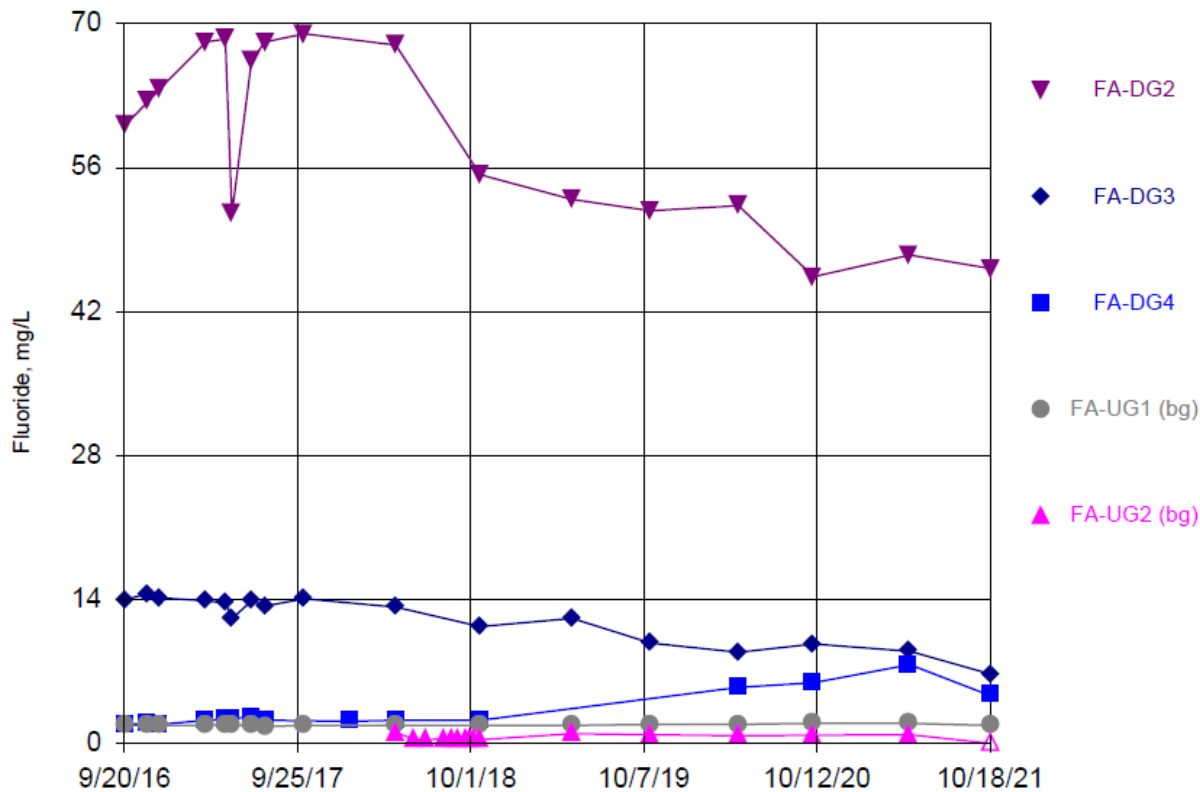


Figure 4 Time-Series Plot of Fluoride Concentrations in Monitoring Wells

The geology of the upper 20 feet of soil logged by Dames & Moore in 1991 consists primarily of very fine-grained sands and silt with occasional traces of clay. These sediments are geologically recent deposits, having been transported by alluvial and colluvial processes from the surrounding hills and cliffs of the Uinta Formation. The first and second hypersaline phases of the ancient Lake Uinta caused large depositions of Eocene-aged evaporites, particularly in the area of the Bonanza Power Plant (Vanden Berg and Birgenheier, 2017; Birdwell et al., 2019). Evaporites consist of readily soluble minerals, such as halite (NaCl) and nahcolite (NaHCO_3 , a source of baking soda), which can rapidly dissolve into groundwater.

A search for fluoride concentrations in groundwater within 50 miles of the site yielded 965 records from the Water Quality Portal (NWQMC et al., 2019). Concentrations ranged from below detection to 450 mg/L, with a lowest detected value of 0.03 mg/L and a 95th percentile of approximately 18 mg/L. Because these concentrations indicate naturally occurring levels of fluoride are elevated well above the concentrations observed at FA-DG4, it appears to confirm the hypothesis that natural variability is a likely contributor to the SSI at this well.

In addition, the natural variation hypothesis is also supported by a number of studies that have noted the spatial variability of groundwater compositions in this area (Wallace, 2012; Naftz, 1996; Holmes and Kimball, 1987; Lindskov and Kimball, 1984). The studies describe mineralogical controls on groundwater composition in the region that seem to explain the differences observed between the samples from different wells at the site.

For instance, calcium concentrations can decrease in groundwater when calcium carbonate minerals precipitate out of solution, leaving the groundwater undersaturated with respect to calcium- and fluoride-bearing minerals (e.g., fluorite and apatite). In this condition, the fluoride-bearing minerals may dissolve, increasing groundwater fluoride concentrations. This geochemical relationship appears to explain changes in concentration along the flow path between upgradient and downgradient wells at the site.

For example, low calcium (<5 mg/L) and high fluoride (>10 mg/L) concentrations can occur in areas near where naturally occurring fluoride minerals are dissolving and calcium carbonate is precipitating. In groundwater with this composition, calcium is the limiting constituent in fluorite saturation. This is an explanation for calcium and fluoride concentrations observed in downgradient monitoring wells FA-DG2 and FA-DG3.

In contrast, where there are high calcium concentrations (>200 mg/L) and low fluoride (<2 mg/L) concentrations in groundwater (e.g., at FA-UG2), fluoride is the limiting constituent in fluorite saturation. This scenario is found where calcium minerals such as calcite are readily dissolving, increasing calcium concentrations in groundwater. Calculations made with The Geochemist's Workbench (Bethke, 2008; Table 3) indicate that calcite (calcium carbonate) is near saturation in the five fly ash monitoring wells, whereas the low-fluoride wells (FA-UG1, FA-UG2, and FA-DG4) are undersaturated with respect to fluorite. The calculations were made using data from April 2018, which is the most recent event where alkalinity (bicarbonate) was measured. When fluoride concentrations increase from 2018 concentrations to the concentration measured in fall 2021 (4.7 mg/L), FA-DG4 becomes slightly oversaturated with respect to fluorite. These observations indicate the low concentrations of fluoride are likely due to equilibration with fluorite in the subsurface as water from the NEP migrates toward the downgradient wells.

As groundwater is depleted in calcium due to mineral precipitation or mixes with more calcium-depleted water from upgradient of the landfill, the amount of calcium available to precipitate with fluoride into a mineral phase decreases. As a result, less fluoride is removed from groundwater, and concentrations can increase as groundwater contacts additional fluoride-bearing rocks. The results from FA-DG4 appear to match the conditions expected as part of this process.

The processes of mineral precipitation and dissolution are not necessarily instantaneous. As a result, they are more likely to occur in systems with lower flow and longer contact times with aquifer minerals, which also provide nucleation sites for mineral formation. Therefore, these processes are less likely to occur in surface waters like those sampled from the NEP because the pond is subjected to frequent disturbances such as wave action, pump circulation to misting machines, and discharges into the pond from operations which may prevent precipitation reactions from proceeding to equilibrium. In addition, nucleation sites for mineral formation are less prevalent in surface water than in groundwater.

The geochemical relationships described above also explain an apparent contradiction in that the NEP is a source of fluoride for FA-DG4 while samples from FA-UG2 (located next to the NEP) exhibit a lower concentration of fluoride. The geochemical conceptual model described above suggests that lower fluoride concentrations are expected where high concentrations of calcium from the NEP are resulting in

precipitation of fluorite within the geologic matrix and reducing the concentration in groundwater at this location.

Table 3 Calcite and Fluorite Saturation Indices for Monitoring Wells

Location	Calcium	Fluoride	Calcite	Fluorite
	mg/L	mg/L	log Q/K	log Q/K
FA-DG2	1.2	67.9	0.43	0.54
FA-DG3	1.8	13.3	0.15	-0.32
FA-DG4	54.1	2.3	0.14	-0.58
FA-UG1	11.5	1.8	-0.02	-1.0
FA-UG2	567	1.1	0.06	-0.56
FA-DG4 (2021 F)	54.1	4.7	0.14	0.38

Samples collected in April 2018

Thermodynamic data from The Geochemist's Workbench thermo.tdat

Values in the approximate range of -0.5 to 0.5 are assumed to be near equilibrium saturation.

Values <-0.5 are undersaturated, and values >0.5 are supersaturated.

3.0 Lines of Evidence Supporting an ASD: pH at BA-DG3

As part of the ASD, site data was evaluated to identify potential causes for elevated pH in the BA-DG3 monitoring well. The following potential source were selected for investigation:

- A source other than the CCR unit

A hypothesis was developed to evaluate the potential alternatives for the SSIs included in the rule and then tested against available data to determine if site data support the hypothesis as described in the following sections.

3.1 A source other than the CCR unit

- Hypothesis: If the BA Landfill (the CCR Unit) is the source of a release to groundwater that caused the SSI for pH at BA-DG3, the expected concentrations of other parameters indicative of a CCR release should appear elevated in samples from BA-DG3 at about the same time.
- Analysis: Concentrations of other Appendix III parameters in BA-DG3 samples were evaluated.
- Result: Concentrations of the other six Appendix III parameters indicated that other elevated parameters were not present and were observed to have significantly decreasing trends. Decreasing trends for these parameters are the opposite of what would be expected if a pH increase were indicative of a release from the CCR Unit. Therefore, the hypothesis that the CCR Unit is the source of the elevated pH is rejected.

If the CCR Unit is the source of a release to groundwater that caused the SSI for pH at BA-DG3, elevated concentrations of other parameters indicative of a CCR release should appear at about the same time. This is because the CCR Unit water would contain a mixture of all of the Appendix III parameters.

Conversely, if concentrations in BA-DG3 are not elevated for the remaining Appendix III parameters, the hypothesis above would be rejected, leading to the conclusion that the SSI is not the result of a release from the CCR Unit.

Time-series plots of the six Appendix III parameters other than pH are shown in Figure 5. Over the period of record, from 2016 to 2021, concentrations of all six parameters are significantly decreasing. These decreasing concentrations are not consistent with a release from the CCR Unit. Therefore, a release is unlikely, and the source of the pH SSI is not the CCR Unit.

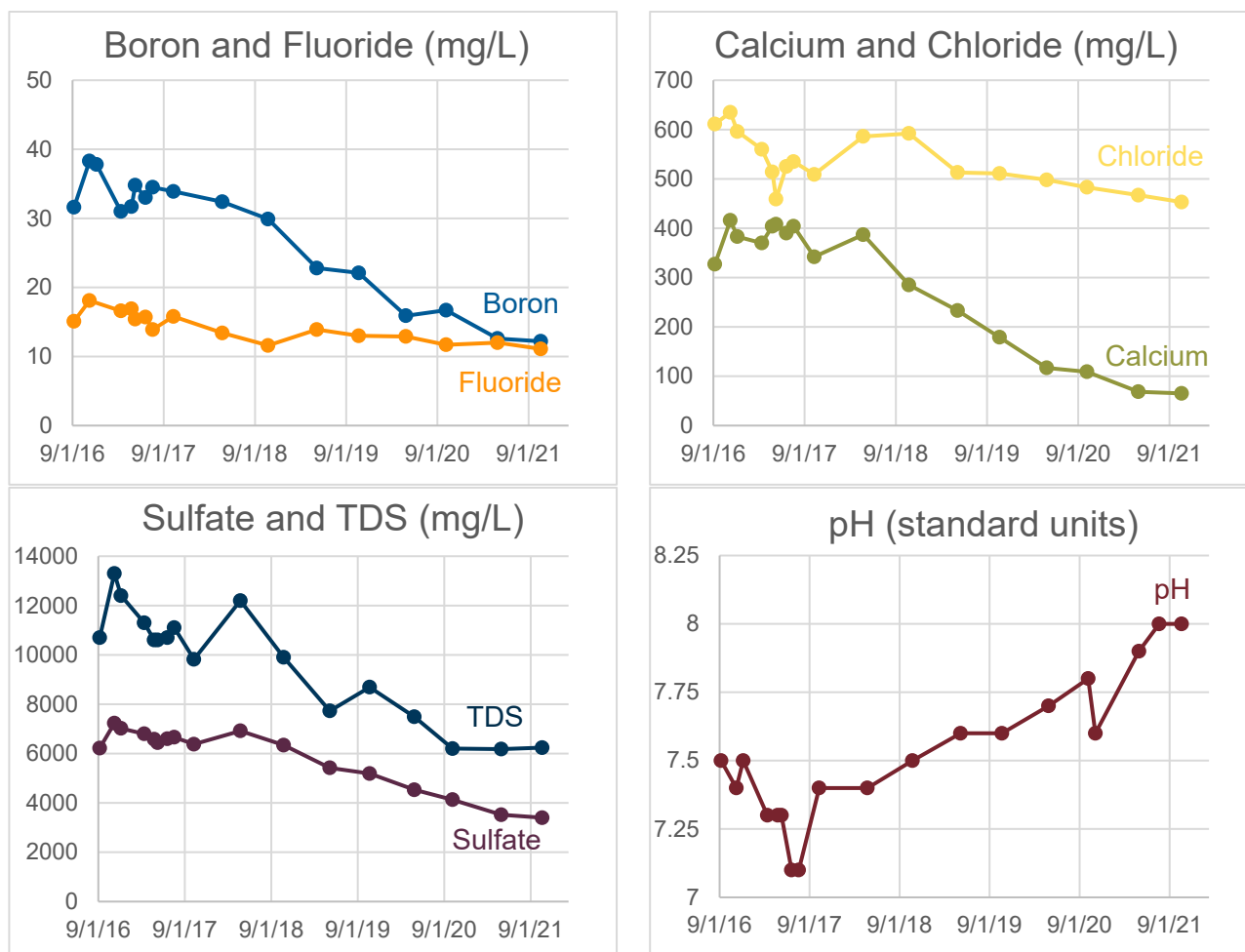


Figure 5 Time-series plots of non-pH Appendix III parameters in BA-DG3

4.0 Conclusion

The foregoing ASD establishes lines of evidence that meet the alternative source requirements of the CCR Rule §257.94(e)(2). Specifically, the SSI for fluoride from the fall 2021 monitoring event at FA-DG4 is due to a "source other than" the Fly Ash Landfill and/or to natural variation based on both site-specific and regional data. The elevated pH in BA-DG3 is due to a source other than the CCR unit because all of the other parameters are decreasing in concentration which is opposite of what would be expected if a presumed release from the CCR unit had occurred.

5.0 Certification

I certify that the written demonstration provided above are supported by the data that is accurate and consistent with our review of the groundwater data collected to date and as required under the CCR Rule ((§257.94(e)(2))).

A handwritten signature in black ink, reading "Dale Kolstad". The signature is written in a cursive style with a long horizontal stroke extending from the end of the name.

Dale Kolstad, P.E. (License #11117963-2202)
Barr Engineering Co.

6.0 References

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Spring 2022 Alternative Source Demonstration (ASD)

Technical Memorandum

To: Tyler Esplin, Deseret Power Electric Cooperative
From: Dale Kolstad, P.E., Barr Engineering Co.
Subject: Spring 2022 Monitoring Event Alternative Source Demonstration (ASD), Bonanza Power Plant
Date: November 4, 2022
Project: 44241001.07 Bonanza Power Plant CCR Groundwater

1.0 Introduction

Deseret Power Electric Cooperative, Bonanza Power near Vernal, UT, has implemented a Detection Monitoring Program in accordance with the U.S. Environmental Protection Agency (EPA) Coal Combustion Residuals (CCR) Rule (40 CFR Parts 257 and 261).

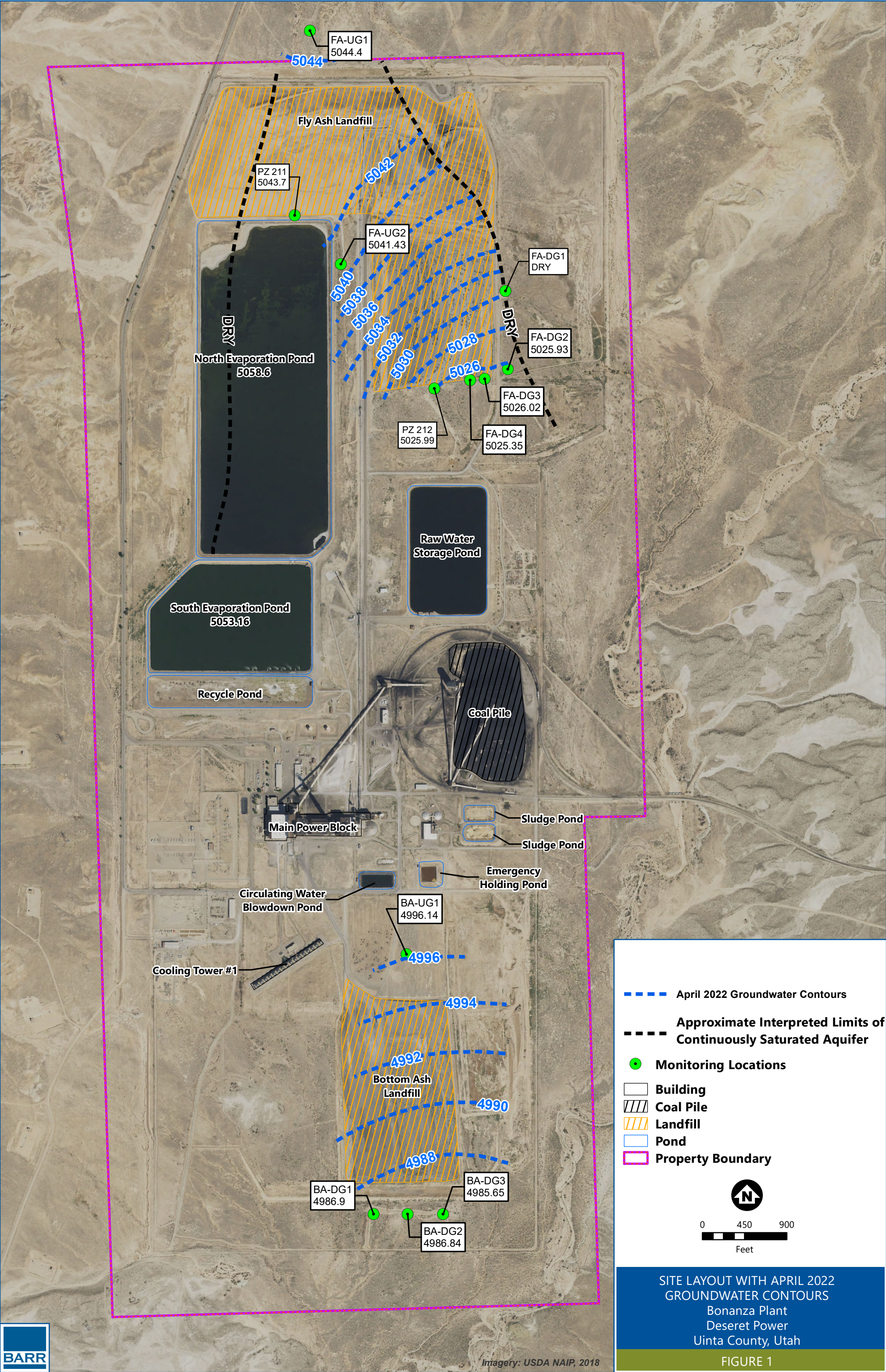
The spring 2022 detection monitoring event occurred on April 18-20, 2022. A statistically significant increase (SSI) was identified for pH at well BA-DG3 at the Bottom Ash (BA) Landfill Area. The final laboratory report was received on May 10, 2022, and a revised lab report with additional quality data was issued on May 24th. Verification resampling was conducted on July 7, 2022. An SSI was determined for pH at well BA-DG3 on August 8, 2022.

1.1 Purpose

This memorandum is intended to provide written documentation of a well-specific ASD for pH in well BA-DG3. It also provides a certification of accuracy for this ASD as described in the CCR Rule (§257.94(e)(2)).

1.2 Background Information

Figure 1 shows the location of the monitoring well network and site features. The conceptual model for the site (Figure 1) consists of groundwater flowing from the north under the BA Area toward the south. Details on the network and conceptual model of groundwater flow are included in the Groundwater Monitoring System Certification (Burns and McDonnell, 2017) and the Annual Review of Groundwater Levels (Loughlin, 2020).



A comparison of the spring 2022 groundwater results with the prediction limits calculated using the baseline data is included in Table 1.

Table 1 Comparison of SSI Parameters with Prediction Limits

Well	Parameter (units)	Measured	Resample	Interwell PL	Intrawell PL
BA-DG3	pH	8.0	8.0	7.0 – 7.3	7.0 – 7.7

PL: Prediction Limit

Previous ASDs were completed for pH at BA-DG3 (Barr, 2021; Barr, 2022) that concluded that the elevated pH was due to a source other than the BA Landfill. This ASD reinforces the findings of those earlier ASDs.

1.3 Rule Requirements

The requirements for written documentation and certification of accuracy for an ASD are included in §257.94(e) (2):

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report.

In accordance with the above requirement, this memorandum is being issued within 90 days of the SSI determination (August 8, 2022).

1.4 Potential Alternative Sources Review

Based on the rule (above), there are five categories that we evaluated for this ASD. These include:

1. A source other than the CCR unit
2. Sampling (or sampling equipment) methods
3. Laboratory methods
4. Statistical methods
5. Natural variation in groundwater quality

2.0 Lines of Evidence Supporting an ASD: pH at BA-DG3

As part of the ASD, site data was evaluated to identify potential causes for elevated pH in the BA-DG3 monitoring well. The following potential source was selected for investigation:

- A source other than the CCR unit

A hypothesis was developed to evaluate the potential alternatives for the SSIs included in the rule and then tested against available data to determine if site data support the hypothesis as described in the following sections.

2.1 A source other than the CCR unit

- Hypothesis: If the BA Landfill (the CCR Unit) is the source of a release to groundwater that caused the SSI for pH at BA-DG3, the expected concentrations of other parameters indicative of a CCR release should appear elevated in samples from BA-DG3 at about the same time.
- Analysis: Concentrations of other Appendix III parameters in BA-DG3 samples were evaluated.
- Result: Concentrations of the other six Appendix III parameters indicated that other elevated parameters were not present and were observed to have significantly decreasing trends. Decreasing trends for these parameters are the opposite of what would be expected if a pH increase were indicative of a release from the CCR Unit. Therefore, the hypothesis that the CCR Unit is the source of the elevated pH is rejected.

If the CCR Unit is the source of a release to groundwater that caused the SSI for pH at BA-DG3, elevated concentrations of other parameters indicative of a CCR release should appear at about the same time. This is because the CCR Unit water would contain a mixture of all of the Appendix III parameters. Conversely, if concentrations in BA-DG3 are not elevated for the remaining Appendix III parameters, the hypothesis above would be rejected, leading to the conclusion that the SSI is not the result of a release from the CCR Unit.

Time-series plots of the Appendix III parameters are shown in Figure 2. Over the period of record, from 2016 to 2022, concentrations of all six parameters other than pH are significantly decreasing. These decreasing concentrations are not consistent with a release from the CCR Unit. Therefore, a release is unlikely, and the source of the pH SSI is not the CCR Unit.

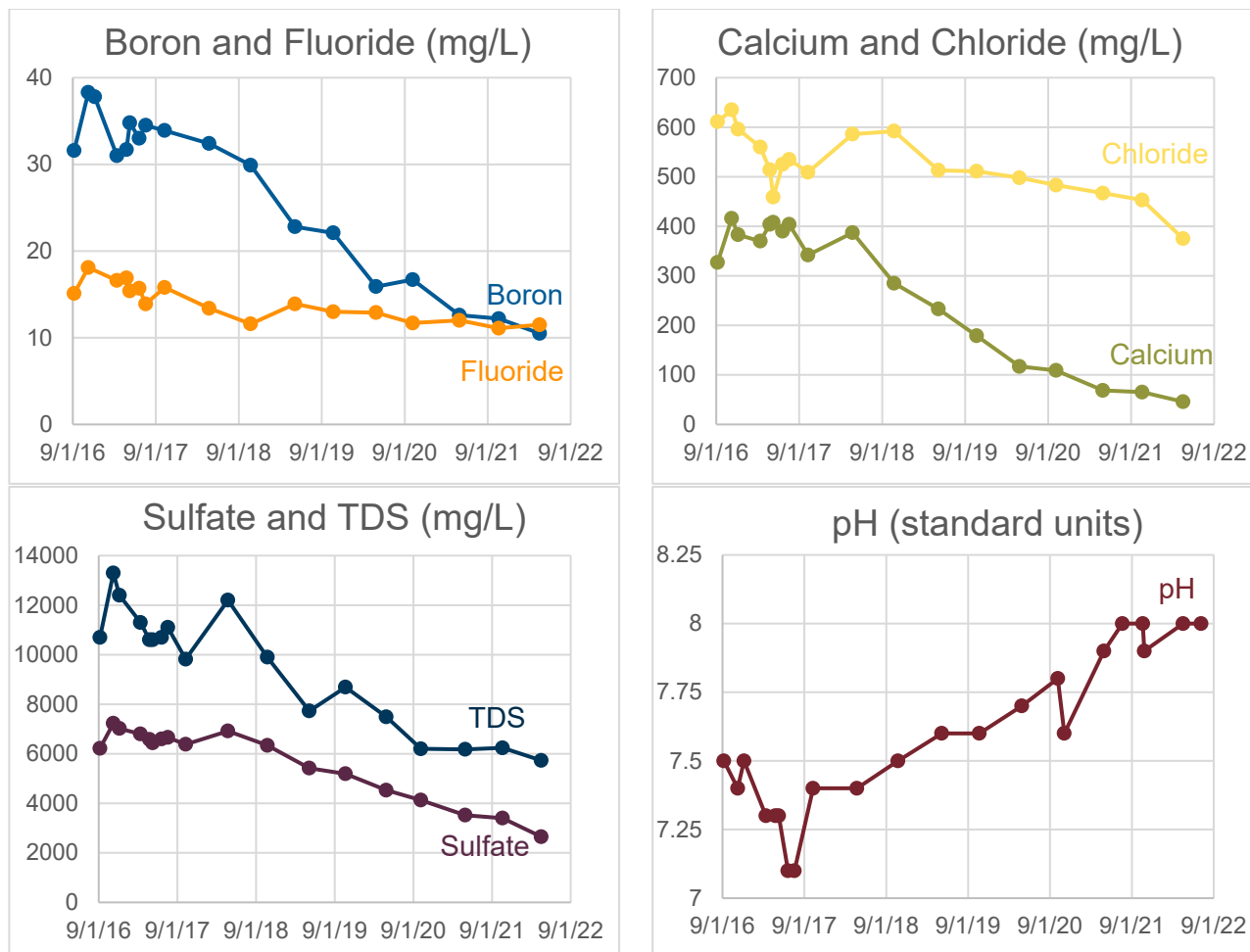


Figure 2 Time-series plots of Appendix III parameters in BA-DG3

3.0 Conclusion

The foregoing ASD establishes lines of evidence that meet the alternative source requirements of the CCR Rule §257.94(e)(2). Specifically, the elevated pH in BA-DG3 is due to a source other than the CCR unit because all of the other parameters are decreasing in concentration which is opposite of what would be expected if a presumed release from the CCR unit had occurred.

4.0 Certification

I certify that the written demonstration provided above are supported by the data that is accurate and consistent with our review of the groundwater data collected to date and as required under the CCR Rule ((§257.94(e)(2))).

A handwritten signature in black ink, reading "Dale Kolstad". The signature is fluid and cursive, with a long horizontal stroke extending from the end of the name.

Dale Kolstad, P.E. (License #11117963-2202)
Barr Engineering Co.

5.0 References

Barr Engineering Co., 2021. Spring 2021 Monitoring Event Alternative Source Demonstration (ASD), Bonanza Power Plant. Technical Memorandum from Jeff Davis to Tyler Esplin, November 30, 2021. Included as Appendix B in 2021 Annual Groundwater Monitoring and Corrective Action Report (January 2022).

Barr Engineering Co., 2022. Fall 2021 Monitoring Event Alternative Source Demonstration (ASD), Bonanza Power Plant. Technical Memorandum from Dale Kolstad to Tyler Esplin, May 4, 2022. Included as Appendix B in 2022 Annual Groundwater Monitoring and Corrective Action Report (in prep.).

Burns & McDonnell, 2017. Groundwater Monitoring System Certification, Deseret Generation and Transmission Cooperative – Bonanza Power Plant, Vernal, Utah. Letter to Tyler Esplin from Block Andrews and Wayne Weber, October 12, 2017.

Loughlin Water Associates, LLC, 2020. Annual Review of Groundwater Levels, December 2018 through December 2019. Prepared for Deseret Generation and Transmission Co-operative, April 2020.

Appendix C

Groundwater Flow Direction and Flow Rates

Deseret Power Fly Ash Area Groundwater Velocity Calculation

Date

4/18/2022

Kh low (ft/d)	0.2	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
Kh high (ft/d)	8.8	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
porosity, n	0.4	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
gradient, i (ft/ft)	0.004	
V low (ft/d)	0.002	
V high (ft/d)	0.099	
V low (ft/yr)	0.82	
V high (ft/yr)	36	
Flow Direction	Southeast	

	Top of Casing Elevation	Depth to Water	Water Level Elevation
	ft amsl	ft below TOC	ft amsl
FA-UG1	5079.35	34.95	5044.40
FA-UG2	5064.89	23.46	5041.43
FA-DG2	5056.55	30.62	5025.93
FA-DG3	5055.02	29.00	5026.02
FA-DG4	5055.67	30.32	5025.35

Fly Ash Landfill horizontal distance, ft

	FA-UG1
FA-DG2	4178
FA-DG3	4152
FA-DG4	4096

Fly Ash Landfill difference in WL elevation, ft

	FA-UG1
FA-DG2	18.47
FA-DG3	18.38
FA-DG4	19.05

Fly Ash Landfill horizontal gradient, ft/ft

	FA-UG1
FA-DG2	0.004
FA-DG3	0.004
FA-DG4	0.005
Average	0.004

Deseret Power Bottom Ash Area Groundwater Velocity Calculation

Date

4/18/2022

Kh low (ft/d)	0.6	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
Kh high (ft/d)	5.2	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
porosity, n	0.4	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
gradient, i (ft/ft)	0.003	
V low (ft/d)	0.005	
V high (ft/d)	0.045	
V low (ft/yr)	1.9	
V high (ft/yr)	16	
Flow Direction	South	

	Top of Casing Elevation	Depth to Water	Water Level Elevation
	ft amsl	ft below TOC	ft amsl
BA-UG1	5030.63	34.49	4996.14
BA-DG1	5001.28	14.38	4986.90
BA-DG2	5002.65	15.81	4986.84
BA-DG3	5002.61	16.96	4985.65

Bottom Ash Landfill horizontal distance, ft

	BA-UG1
BA-DG1	2796
BA-DG2	2773
BA-DG3	2801

Bottom Ash Landfill difference in WL elevation, ft

	BA-UG1
BA-DG1	9.24
BA-DG2	9.30
BA-DG3	10.49

Bottom Ash Landfill horizontal gradient, ft/ft

	BA-UG1
BA-DG1	0.003
BA-DG2	0.003
BA-DG3	0.004
Average	0.003

Deseret Power Fly Ash Area Groundwater Velocity Calculation

Date

10/10-10/17/2022

Kh low (ft/d)	0.2	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
Kh high (ft/d)	8.8	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
porosity, n	0.4	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
gradient, i (ft/ft)	0.005	
V low (ft/d)	0.002	
V high (ft/d)	0.100	
V low (ft/yr)	0.83	
V high (ft/yr)	37	
Flow Direction	Southeast	

	Top of Casing Elevation	Depth to Water	Water Level Elevation
	ft amsl	ft below TOC	ft amsl
FA-UG1	5079.35	35.05	5044.30
FA-UG2	5064.89	23.56	5041.33
FA-DG2	5056.55	31.08	5025.47
FA-DG3	5055.02	29.28	5025.74
FA-DG4	5055.67	30.63	5025.04

Fly Ash Landfill horizontal distance, ft

	FA-UG1
FA-DG2	4178
FA-DG3	4152
FA-DG4	4096

Fly Ash Landfill difference in WL elevation, ft

	FA-UG1
FA-DG2	18.83
FA-DG3	18.56
FA-DG4	19.26

Fly Ash Landfill horizontal gradient, ft/ft

	FA-UG1
FA-DG2	0.005
FA-DG3	0.004
FA-DG4	0.005
Average	0.005

Deseret Power Bottom Ash Area Groundwater Velocity Calculation

Date

10/11&17/2022

Kh low (ft/d)	0.6	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
Kh high (ft/d)	5.2	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
porosity, n	0.4	Groundwater Monitoring System Certification (Burns & McDonnell, 2017)
gradient, i (ft/ft)	0.003	
V low (ft/d)	0.005	
V high (ft/d)	0.045	
V low (ft/yr)	1.9	
V high (ft/yr)	16	
Flow Direction	South	

	Top of Casing Elevation	Depth to Water	Water Level Elevation
	ft amsl	ft below TOC	ft amsl
BA-UG1	5030.63	34.86	4995.77
BA-DG1	5001.28	14.82	4986.46
BA-DG2	5002.65	16.09	4986.56
BA-DG3	5002.61	17.19	4985.42

Bottom Ash Landfill horizontal distance, ft

	BA-UG1
BA-DG1	2796
BA-DG2	2773
BA-DG3	2801

Bottom Ash Landfill difference in WL elevation, ft

	BA-UG1
BA-DG1	9.31
BA-DG2	9.21
BA-DG3	10.35

Bottom Ash Landfill horizontal gradient, ft/ft

	BA-UG1
BA-DG1	0.003
BA-DG2	0.003
BA-DG3	0.004
Average	0.003

Appendix D

FA-DG5 (PZ-212) Information



Barr Engineering Co.
4300 MarketPointe Drive Suite 200
Minneapolis, MN 55435
Telephone: 952-832-2600

LOG OF BORING PZ-212/ Well FA-DG5 Construction

Sheet 1 of 1

Project: Deseret Power		Location: Deseret Power Bonanza Plant		Client: Deseret Power			
Barr Project Number: 44241001.07		Surface Elevation: 5053.29 ft		Top of Casing Elevation: 5056.24			
STRATA		SYMBOL	WELL OR PIEZOMETER CONSTRUCTION DETAILS	DEPTH, ft	ELEVATION, ft	CONSTRUCTION DETAILS FOR MONITORING WELL	
DESCRIPTION							
				-3.40 -2.95	TPC TRC	5056.69 5056.24	PROTECTIVE CASING Diameter: 6" Type: Steel Interval: -3.4 - 4 ft
POORLY-GRADED SAND (SP): fine grained; tan; dry to moist.				0.0	GS	5053.29	RISER CASING Diameter: 2" Type: Schedule 80 PVC Interval: -2.95 - 35 ft
5048.3 ft							GROUT Type: Bentonite Chips Interval: 2 - 33 ft
SANDY SILT (ML): tan; dry to moist.							SEAL Type: Bentonite Chips Interval: 2 - 33 ft
5029.3 ft							SANDPACK Type: Silica Sand Interval: 33 - 45 ft
POORLY-GRADED SAND (SP): coarse grained; tan; wet.							SCREEN Diameter: 2" Type: Schedule 80 PVC Interval: 35 - 45 ft
5025.3 ft							Remarks: Monitoring Well FA-DG5
POORLY-GRADED SAND (SP): medium grained; tan; wet; trace small gravel.							
5023.8 ft							
POORLY-GRADED SAND (SP): coarse grained; tan; wet.				33.0	BS	5020.3	
5021.3 ft							
FAT CLAY (CH): tan; wet; high plasticity.							
5020.3 ft							
SILTY SAND (SM): fine to medium grained; tan; wet.							
5015.3 ft							
WELL-GRADED SAND (SW): fine to coarse grained; tan; wet; loose.							
5009.3 ft							
SANDY SILT (ML): tan; wet; medium dense.				45.0	FP	5008.3	
5008.3 ft							
Bottom of Boring at 45.0 feet							
Completion Depth: 45.0 ft		LEGEND				WATER LEVELS(ft)	
Date Started: 12/14/21		TPC TOP OF PROTECTIVE CASING				At Time of Drilling 25.0	
Date Completed: 12/14/21		TRC TOP OF RISER CASING					
Logged By: CJ		BPC BASE PROTECTIVE CASING					
Drilling Contractor: Cascade		GS GROUND SURFACE					
Drilling Method: Mini-Sonic		BS BENTONITE SEAL					
Datum:		FP FILTER PACK					
Coordinates: Lat: 40.099164° Long: -109.280914°		TSC TOP OF SCREEN					
		BSC BOTTOM OF SCREEN					
		TD TOTAL DEPTH					

The stratification lines represent approximate boundaries. The transition may be gradual.

[illegible]

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: Deseret Power Electric Cooperative
 ADDRESS: 12500 East 25500 South
 CITY/STATE/ZIP: Vernal, UT 84078-8525
 PHONE #: 435-781-5706 FAX: _____
 CONTACT: Tyler Esplin PROJECT: PZ-212
 EMAIL: tesplin@deseretpower.com

BILLING ADDRESS: _____
 BILLING CITY/STATE/ZIP: _____
 PURCHASE ORDER #: 183244



UPS NEXT DAY AIR
 TRACKING #: 1Z 849 747 01 6310 0384

Sample Receipt Conditions:

- ☐ Custody Seals Present
☒ Containers Intact
☒ COC and Labels Match
☒ Received on Ice
- ☒ Correct Containers
☒ COC Included
☒ COC Complete
☒ Sufficient Sample Volume
- ☐ Headspace Present (VOC)
☐ Temperature Blank
☒ Received within Hold
 Checked by: [Signature]

TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

Lab Use Only		CLIENT SAMPLE INFORMATION						TESTS REQUESTED														Bacteria									
		LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	Alkalinity	Chloride	Fluoride	Sulfate	TDS	Mercury	Metals by EPA 200.7 *	Metals by EPA 200.8 **	Radium-226	Radium-228									Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only			
01	1.	PZ-212	12-13-22	11:56	Water		X	X	X	X	X	X	X	X	X	X															
	2.																														
	3.																														
	4.																														
	5.																														
	6.																														
	7.																														
	8.																														
	9.																														
	10.																														
Sampled by: [print] <u>Trenton Keller</u>		Sampled by: [signature] <u>[Signature]</u>					ON ICE NOT ON ICE Temp (C°): <u>0.8</u>																								
Special Instructions: * Ba,B,Ca,Co,Li,Mo,Mg,K,Na,P ** Sb,As,Be,Cd,Cr,Pb,Se,Tl		Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.																													
Relinquished by: [signature] <u>[Signature]</u>		Date/Time <u>12-14-22 / 12:45</u>					Received by: [signature] <u>[Signature]</u>																				Date/Time <u>12-14-22 / 12:45</u>				
Relinquished by: [signature] <u>[Signature]</u>		Date/Time <u>12-14-22 / 3:00</u>					Received by: [signature] <u>[Signature]</u>																				Date/Time <u>12/15/22 11:38</u>				
Relinquished by: [signature]		Date/Time					Received by: [signature]																				Date/Time				

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 Sandy, UT 84070

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 866.792.0093 FAX
 www.chemtechford.com

Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.



1/19/2023

Work Order: 22L1228
Project: PZ-212

Deseret Power Electric Cooperative
Attn: Tyler Esplin
12500 East 25500 South
Vernal, UT 84078-8525

Client Service Contact: 801.262.7299

The analyses presented on this report were performed in accordance with the National Environmental Laboratory Accreditation Program (NELAP) unless noted in the comments, flags, or case narrative. If the report is to be used for regulatory compliance, it should be presented in its entirety, and not be altered.



Approved By:

Dave Gayer, Laboratory Director



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Certificate of Analysis

Deseret Power Electric Cooperative
Tyler Esplin
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 183244
Receipt: 12/15/22 11:38 @ 0.8 °C
Date Reported: 1/19/2023
Project Name: PZ-212

Sample ID: PZ-212

Matrix: Water

Lab ID: 22L1228-01

Date Sampled: 12/13/22 11:56

Sampled By: Trenton Keller

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Alkalinity - Bicarbonate (as CaCO ₃)	320	mg/L	1.0	SM 2320 B	12/16/22	12/16/22	
Alkalinity - Carbonate (as CaCO ₃)	ND	mg/L	1.0	SM 2320 B	12/16/22	12/16/22	
Alkalinity - Hydroxide (as CaCO ₃)	ND	mg/L	1.0	SM 2320 B	12/16/22	12/16/22	
Alkalinity - Total (as CaCO ₃)	320	mg/L	1.0	SM 2320 B	12/16/22	12/16/22	
Chloride	1750	mg/L	100	EPA 300.0	12/15/22	12/15/22	
Fluoride	0.966	mg/L	0.500	EPA 300.0	12/15/22	12/16/22	
Sulfate	9150	mg/L	100	EPA 300.0	12/15/22	12/15/22	
Total Dissolved Solids (TDS)	16400	mg/L	500	SM 2540 C	12/15/22	12/15/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	12/16/22	12/19/22	
Arsenic, Total	0.0119	mg/L	0.0005	EPA 200.8	12/16/22	12/19/22	
Barium, Total	ND	mg/L	0.100	EPA 200.7	12/19/22	12/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	12/16/22	12/19/22	
Boron, Total	51.6	mg/L	1.00	EPA 200.7	12/19/22	12/19/22	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	12/16/22	12/19/22	
Calcium, Total	482	mg/L	4.0	EPA 200.7	12/19/22	12/19/22	
Chromium, Total	0.0055	mg/L	0.0005	EPA 200.8	12/20/22	12/20/22	
Cobalt, Total	ND	mg/L	0.20	EPA 200.7	12/19/22	12/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	12/16/22	12/19/22	
Lithium, Total	0.484	mg/L	0.100	EPA 200.7	12/19/22	12/19/22	
Magnesium, Total	748	mg/L	4.0	EPA 200.7	12/19/22	12/19/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	12/19/22	12/20/22	
Molybdenum, Total	ND	mg/L	0.20	EPA 200.7	12/19/22	12/19/22	
Phosphorus, Total as P	ND	mg/L	0.2	EPA 200.7	12/19/22	12/19/22	
Potassium, Total	ND	mg/L	10.0	EPA 200.7	12/19/22	12/19/22	
Selenium, Total	0.0833	mg/L	0.0005	EPA 200.8	12/16/22	12/19/22	
Sodium, Total	3240	mg/L	10.0	EPA 200.7	12/19/22	12/19/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	12/16/22	12/19/22	



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Certificate of Analysis

Deseret Power Electric Cooperative
Tyler Esplin
12500 East 25500 South
Vernal, UT 84078-8525

PO#: 183244
Receipt: 12/15/22 11:38 @ 0.8 °C
Date Reported: 1/19/2023
Project Name: PZ-212

Report Footnotes

Abbreviations

ND = Not detected at the corresponding Minimum Reporting Limit (MRL).

1 mg/L = one milligram per liter or 1 mg/kg = one milligram per kilogram = 1 part per million.

1 ug/L = one microgram per liter or 1 ug/kg = one microgram per kilogram = 1 part per billion.

1 ng/L = one nanogram per liter or 1 ng/kg = one nanogram per kilogram = 1 part per trillion.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: Deseret Power Electric Cooperative
 ADDRESS: 12500 East 25500 South
 CITY/STATE/ZIP: Vernal, UT 84078-8525
 PHONE #: 435-781-5706 FAX: _____
 CONTACT: Tyler Esplin PROJECT: PZ-212
 EMAIL: tesplin@deseretpower.com

BILLING ADDRESS: _____
 BILLING CITY/STATE/ZIP: _____
 PURCHASE ORDER #: 183244



UPS NEXT DAY AIR

TRACKING #: 1Z 849 747 01 6310 0384

Sample Receipt Conditions:

- ☐ Custody Seals Present
☒ Containers Intact
☒ COC and Labels Match
☒ Received on Ice
- ☒ Correct Containers
☒ COC Included
☒ COC Complete
☒ Sufficient Sample Volume
- ☐ Headspace Present (VOC)
☐ Temperature Blank
☒ Received within Hold
 Checked by: [Signature]

TURNAROUND REQUIRED:*

* Expedited turnaround subject to additional charge

Lab Use Only		CLIENT SAMPLE INFORMATION						TESTS REQUESTED														Bacteria									
		LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	Alkalinity	Chloride	Fluoride	Sulfate	TDS	Mercury	Metals by EPA 200.7 *	Metals by EPA 200.8 **	Radium-226	Radium-228									Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only			
01	1.	PZ-212	12-13-22	11:56	Water		X	X	X	X	X	X	X	X	X	X															
	2.																														
	3.																														
	4.																														
	5.																														
	6.																														
	7.																														
	8.																														
	9.																														
	10.																														
Sampled by: [print] <u>Trenton Keller</u>		Sampled by: [signature] <u>[Signature]</u>					ON ICE NOT ON ICE Temp (C°): <u>0.8</u>																								
Special Instructions: * Ba,B,Ca,Co,Li,Mo,Mg,K,Na,P ** Sb,As,Be,Cd,Cr,Pb,Se,Tl		Samples received outside the EPA recommended temperature range of 0-6 C° may be rejected.																													
Relinquished by: [signature] <u>[Signature]</u>		Date/Time <u>12-14-22 / 12:45</u>					Received by: [signature] <u>[Signature]</u>																				Date/Time <u>12-14-22 / 12:45</u>				
Relinquished by: [signature] <u>[Signature]</u>		Date/Time <u>12-14-22 / 3:00</u>					Received by: [signature] <u>[Signature]</u>																				Date/Time <u>12/15/22 11:38</u>				
Relinquished by: [signature]		Date/Time					Received by: [signature]																				Date/Time				

CHEMTECH-FORD
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Payment Terms are net 30 days OAC. 1.5% interest charge per month (18% per annum). Client agrees to pay collection costs and attorney's fees.

QC Report for Work Order (WO) - 22L1228

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Blank - EPA 200.7

QC Sample ID: BWL0789-BLK1	Batch: BWL0789								
Date Prepared: 12/19/2022	Date Analyzed: 12/19/2022								
Barium, Total					ND		0.005	1.00	
Boron, Total					ND		0.05	1.00	
Calcium, Total					ND		0.2	1.00	
Cobalt, Total					ND		0.01	1.00	
Lithium, Total					ND		0.005	1.00	
Magnesium, Total					ND		0.2	1.00	
Molybdenum, Total					ND		0.01	1.00	
Phosphorus, Total as P					ND		0.01	1.00	
Potassium, Total					ND		0.5	1.00	
Sodium, Total					ND		0.5	1.00	

LCS - EPA 200.7

QC Sample ID: BWL0789-BS1	Batch: BWL0789								
Date Prepared: 12/19/2022	Date Analyzed: 12/19/2022								
Barium, Total	98.5	85 - 115		0.197		0.200	0.005	1.00	
Boron, Total	96.3	85 - 115		0.48		0.500	0.05	1.00	
Calcium, Total	97.0	85 - 115		9.9		10.2	0.2	1.00	
Cobalt, Total	95.8	85 - 115		0.19		0.200	0.01	1.00	
Lithium, Total	102	85 - 115		0.205		0.200	0.005	1.00	
Magnesium, Total	95.9	85 - 115		9.8		10.2	0.2	1.00	
Molybdenum, Total	97.1	85 - 115		0.19		0.200	0.01	1.00	
Phosphorus, Total as P	111	85 - 115		1.1		1.00	0.01	1.00	
Potassium, Total	98.7	85 - 115		9.9		10.0	0.5	1.00	
Sodium, Total	95.2	85 - 115		9.5		10.0	0.5	1.00	

Matrix Spike - EPA 200.7

QC Sample ID: BWL0789-MS1	Batch: BWL0789		QC Source Sample: XXXXXXXX-XX				
Date Prepared: 12/19/2022	Date Analyzed: 12/19/2022						
Barium, Total	102	70 - 130	0.396	0.192	0.200	0.005	1.00
Boron, Total	101	70 - 130	0.72	0.22	0.500	0.05	1.00
Calcium, Total	105	70 - 130	73.0	62.3	10.2	0.2	1.00
Cobalt, Total	103	70 - 130	0.21	ND	0.200	0.01	1.00
Lithium, Total	110	70 - 130	0.231	0.010	0.200	0.005	1.00
Magnesium, Total	99.9	70 - 130	24.0	13.8	10.2	0.2	1.00
Molybdenum, Total	105	70 - 130	0.21	0.002	0.200	0.01	1.00
Phosphorus, Total as P	116	70 - 130	1.5	0.3	1.00	0.01	1.00
Potassium, Total	101	70 - 130	24.2	14.1	10.0	0.5	1.00
Sodium, Total	121	70 - 130	243	231	10.0	0.5	1.00

QC Sample ID: BWL0789-MS2	Batch: BWL0789		QC Source Sample: XXXXXXXX-XX				
Date Prepared: 12/19/2022	Date Analyzed: 12/19/2022						
Barium, Total	99.8	70 - 130	0.330	0.130	0.200	0.005	1.00
Boron, Total	135	70 - 130	0.92	0.24	0.500	0.05	1.00

QM-010 - The MS recovery was outside acceptance limits but passed Duplicate Spike acceptance limits. The batch was accepted based on the acceptability of the MSD as the batch Spike.

Cobalt, Total	107	70 - 130		0.21	ND	0.200	0.01	1.00	
Molybdenum, Total	113	70 - 130		0.23	0.002	0.200	0.01	1.00	
Phosphorus, Total as P	-166	70 - 130		6.0	7.6	1.00	0.01	1.00	

QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.

Potassium, Total	105	70 - 130		33.0	22.5	10.0	0.5	1.00	
Sodium, Total	2950	70 - 130		410	115	10.0	0.5	1.00	

CtF WO#: 22L1228

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QC Report for Work Order (WO) - 22L1228

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
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Matrix Spike - EPA 200.7 (cont.)

QC Sample ID: BWL0789-MS2	Batch: BWL0789	QC Source Sample: XXXXXXXX-XX
Date Prepared: 12/19/2022	Date Analyzed: 12/19/2022	

QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.

Matrix Spike Dup - EPA 200.7

QC Sample ID: BWL0789-MSD1	Batch: BWL0789	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 12/19/2022	Date Analyzed: 12/19/2022								
Barium, Total	105	1.28	70 - 130	20	0.401	0.192	0.200	0.005	1.00
Boron, Total	103	1.28	70 - 130	20	0.73	0.22	0.500	0.05	1.00
Calcium, Total	115	1.40	70 - 130	20	74.0	62.3	10.2	0.2	1.00
Cobalt, Total	102	0.828	70 - 130	20	0.20	ND	0.200	0.01	1.00
Lithium, Total	110	0.478	70 - 130	20	0.230	0.010	0.200	0.005	1.00
Magnesium, Total	103	1.25	70 - 130	20	24.3	13.8	10.2	0.2	1.00
Molybdenum, Total	105	0.00	70 - 130	20	0.21	0.002	0.200	0.01	1.00
Phosphorus, Total as P	118	0.960	70 - 130	20	1.5	0.3	1.00	0.01	1.00
Potassium, Total	105	1.38	70 - 130	20	24.5	14.1	10.0	0.5	1.00
Sodium, Total	152	1.24	70 - 130	20	246	231	10.0	0.5	1.00

QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.

QC Sample ID: BWL0789-MSD2	Batch: BWL0789	QC Source Sample: XXXXXXXX-XX							
Date Prepared: 12/19/2022	Date Analyzed: 12/19/2022								
Barium, Total	104	2.37	70 - 130	20	0.338	0.130	0.200	0.005	1.00
Boron, Total	103	19.3	70 - 130	20	0.76	0.24	0.500	0.05	1.00
Cobalt, Total	105	1.65	70 - 130	20	0.21	ND	0.200	0.01	1.00
Molybdenum, Total	107	5.63	70 - 130	20	0.22	0.002	0.200	0.01	1.00
Phosphorus, Total as P	114	38.0	70 - 130	20	8.8	7.6	1.00	0.01	1.00

QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.

Potassium, Total	105	0.123	70 - 130	20	33.0	22.5	10.0	0.5	1.00
Sodium, Total	106	106	70 - 130	20	126	115	10.0	0.5	1.00

QM-4X - The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.

QC Report for Work Order (WO) - 22L1228

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.8									
QC Sample ID: BWL0804-BLK1		Batch: BWL0804							
Date Prepared: 12/16/2022		Date Analyzed: 12/19/2022							
Antimony, Total					ND			0.0005	1.00
Arsenic, Total					ND			0.0005	1.00
Beryllium, Total					ND			0.0005	1.00
Cadmium, Total					ND			0.0002	1.00
Lead, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
QC Sample ID: BWL0845-BLK1		Batch: BWL0845							
Date Prepared: 12/20/2022		Date Analyzed: 12/20/2022							
Chromium, Total					ND			0.0005	1.00
LCS - EPA 200.8									
QC Sample ID: BWL0804-BS1		Batch: BWL0804							
Date Prepared: 12/16/2022		Date Analyzed: 12/19/2022							
Antimony, Total	107	85 - 115			0.043		0.0400	0.0005	1.00
Arsenic, Total	101	85 - 115			0.040		0.0400	0.0005	1.00
Beryllium, Total	103	85 - 115			0.041		0.0400	0.0005	1.00
Cadmium, Total	107	85 - 115			0.043		0.0400	0.0002	1.00
Lead, Total	105	85 - 115			0.042		0.0400	0.0005	1.00
Selenium, Total	104	85 - 115			0.042		0.0400	0.0005	1.00
Thallium, Total	108	85 - 115			0.043		0.0400	0.0002	1.00
QC Sample ID: BWL0845-BS1		Batch: BWL0845							
Date Prepared: 12/20/2022		Date Analyzed: 12/20/2022							
Chromium, Total	108	85 - 115			0.043		0.0400	0.0005	1.00
Matrix Spike - EPA 200.8									
QC Sample ID: BWL0804-MS1		Batch: BWL0804		QC Source Sample: XXXXXXXX-XX					
Date Prepared: 12/16/2022		Date Analyzed: 12/19/2022							
Antimony, Total	104	70 - 130			0.042	0.00004	0.0400	0.0005	1.00
Arsenic, Total	97.5	70 - 130			0.039	ND	0.0400	0.0005	1.00
Beryllium, Total	92.3	70 - 130			0.037	ND	0.0400	0.0005	1.00
Cadmium, Total	96.6	70 - 130			0.039	0.0001	0.0400	0.0002	1.00
Lead, Total	91.0	70 - 130			0.036	0.00004	0.0400	0.0005	1.00
Selenium, Total	104	70 - 130			0.051	0.009	0.0400	0.0005	1.00
Thallium, Total	94.3	70 - 130			0.038	0.0002	0.0400	0.0002	1.00
QC Sample ID: BWL0804-MS2		Batch: BWL0804		QC Source Sample: 22L1228-01					
Date Prepared: 12/16/2022		Date Analyzed: 12/19/2022							
Antimony, Total	104	70 - 130			0.042	0.0003	0.0400	0.0005	1.00
Arsenic, Total	104	70 - 130			0.053	0.012	0.0400	0.0005	1.00
Beryllium, Total	93.1	70 - 130			0.037	0.0001	0.0400	0.0005	1.00
Cadmium, Total	92.9	70 - 130			0.037	0.0002	0.0400	0.0002	1.00
Chromium, Total	88.6	70 - 130			0.042	0.006	0.0400	0.0005	1.00
Lead, Total	87.4	70 - 130			0.035	0.0004	0.0400	0.0005	1.00
Selenium, Total	130	70 - 130			0.135	0.083	0.0400	0.0005	1.00
Thallium, Total	91.3	70 - 130			0.037	0.0001	0.0400	0.0002	1.00
QC Sample ID: BWL0845-MS1		Batch: BWL0845		QC Source Sample: XXXXXXXX-XX					
Date Prepared: 12/20/2022		Date Analyzed: 12/20/2022							
Chromium, Total	106	70 - 130			0.045	0.003	0.0400	0.0005	1.00

QC Report for Work Order (WO) - 22L1228

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Matrix Spike - EPA 200.8 (cont.)

QC Sample ID: BWL0845-MS2

Batch: BWL0845

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/20/2022

Date Analyzed: 12/20/2022

Chromium, Total

106

70 - 130

0.090

0.005

0.0800

0.0005

1.00

QC Report for Work Order (WO) - 22L1228

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Blank - EPA 245.1

QC Sample ID: BWL0793-BLK1

Batch: BWL0793

Date Prepared: 12/19/2022

Date Analyzed: 12/20/2022

Mercury, Total

ND

0.00015

1.00

LCS - EPA 245.1

QC Sample ID: BWL0793-BS1

Batch: BWL0793

Date Prepared: 12/19/2022

Date Analyzed: 12/20/2022

Mercury, Total

100

85 - 115

0.00500

0.00500

0.00015

1.00

Matrix Spike - EPA 245.1

QC Sample ID: BWL0793-MS1

Batch: BWL0793

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/19/2022

Date Analyzed: 12/20/2022

Mercury, Total

99.0

75 - 125

0.00495

ND

0.00500

0.00015

1.00

QC Sample ID: BWL0793-MS2

Batch: BWL0793

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/19/2022

Date Analyzed: 12/20/2022

Mercury, Total

101

75 - 125

0.00507

ND

0.00500

0.00015

1.00

Matrix Spike Dup - EPA 245.1

QC Sample ID: BWL0793-MSD1

Batch: BWL0793

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/19/2022

Date Analyzed: 12/20/2022

Mercury, Total

102

3.35

75 - 125

20

0.00512

ND

0.00500

0.00015

1.00

QC Sample ID: BWL0793-MSD2

Batch: BWL0793

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/19/2022

Date Analyzed: 12/20/2022

Mercury, Total

101

0.629

75 - 125

20

0.00504

ND

0.00500

0.00015

1.00

QC Report for Work Order (WO) - 22L1228

Analyte

% Rec

RPD

Limits

RPD Max

Result

Source Conc

Spk Value

MRL

DF

Blank - EPA 300.0

QC Sample ID: BWL0666-BLK1

Batch: BWL0666

Date Prepared: 12/15/2022

Date Analyzed: 12/15/2022

Chloride				ND			1.00	1.00
Fluoride				ND			0.100	1.00
Sulfate				ND			1.00	1.00

LCS - EPA 300.0

QC Sample ID: BWL0666-BS1

Batch: BWL0666

Date Prepared: 12/15/2022

Date Analyzed: 12/15/2022

Chloride	99.7		90 - 110	49.9		50.0	1.00	1.00
Fluoride	97.8		90 - 110	4.89		5.00	0.100	1.00
Sulfate	100		90 - 110	50.2		50.0	1.00	1.00

Matrix Spike - EPA 300.0

QC Sample ID: BWL0666-MS1

Batch: BWL0666

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/15/2022

Date Analyzed: 12/15/2022

Chloride	99.9		80 - 120	14.6	3.54	11.1	1.11	1.00
Fluoride	92.3		80 - 120	1.75	0.724	1.11	0.111	1.00
Sulfate	97.8		80 - 120	195	184	11.1	1.11	1.00

QC Sample ID: BWL0666-MS2

Batch: BWL0666

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/15/2022

Date Analyzed: 12/15/2022

Chloride	99.4		80 - 120	209	159	50.0	5.50	1.00
Fluoride	88.3		80 - 120	4.72	0.309	5.00	0.550	1.00
Sulfate	100		80 - 120	132	82.2	50.0	5.50	1.00

Matrix Spike Dup - EPA 300.0

QC Sample ID: BWL0666-MSD1

Batch: BWL0666

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/15/2022

Date Analyzed: 12/15/2022

Chloride	100	0.216	80 - 120	20	14.7	3.54	11.1	1.11	1.00
Fluoride	93.0	0.425	80 - 120	20	1.76	0.724	1.11	0.111	1.00
Sulfate	97.1	0.0419	80 - 120	20	195	184	11.1	1.11	1.00

QC Sample ID: BWL0666-MSD2

Batch: BWL0666

QC Source Sample: XXXXXXXX-XX

Date Prepared: 12/15/2022

Date Analyzed: 12/15/2022

Chloride	97.9	0.351	80 - 120	20	208	159	50.0	5.50	1.00
Fluoride	87.8	0.525	80 - 120	20	4.70	0.309	5.00	0.550	1.00
Sulfate	98.9	0.515	80 - 120	20	132	82.2	50.0	5.50	1.00

QC Report for Work Order (WO) - 22L1228

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2320 B									
QC Sample ID: BWL0733-BLK1	Batch: BWL0733								
Date Prepared: 12/16/2022	Date Analyzed: 12/16/2022								
Alkalinity - Bicarbonate (as CaCO3)					ND			1.0	1.00
Alkalinity - Carbonate (as CaCO3)					ND			1.0	1.00
Alkalinity - Hydroxide (as CaCO3)					ND			1.0	1.00
Alkalinity - Total (as CaCO3)					ND			1.0	1.00
Duplicate - SM 2320 B									
QC Sample ID: BWL0733-DUP1	Batch: BWL0733		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 12/16/2022	Date Analyzed: 12/16/2022								
Alkalinity - Bicarbonate (as CaCO3)	1.64		20		277	273		1.0	1.00
Alkalinity - Carbonate (as CaCO3)			20		ND	ND		1.0	1.00
Alkalinity - Hydroxide (as CaCO3)			20		ND	ND		1.0	1.00
Alkalinity - Total (as CaCO3)	1.64		20		277	273		1.0	1.00
LCS - SM 2320 B									
QC Sample ID: BWL0733-BS1	Batch: BWL0733								
Date Prepared: 12/16/2022	Date Analyzed: 12/16/2022								
Alkalinity - Total (as CaCO3)	90.9		90 - 110		215		236	1.0	1.00

QC Report for Work Order (WO) - 22L1228

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2540 C									
QC Sample ID: BWL0662-BLK1	Batch: BWL0662								
Date Prepared: 12/15/2022	Date Analyzed: 12/15/2022								
Total Dissolved Solids (TDS)					ND			20	1.00
Duplicate - SM 2540 C									
QC Sample ID: BWL0662-DUP1	Batch: BWL0662		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 12/15/2022	Date Analyzed: 12/15/2022								
Total Dissolved Solids (TDS)	2		10	1630	1590			20	1.00
QC Sample ID: BWL0662-DUP2	Batch: BWL0662		QC Source Sample: XXXXXXXX-XX						
Date Prepared: 12/15/2022	Date Analyzed: 12/15/2022								
Total Dissolved Solids (TDS)	2		10	752	768			20	1.00
LCS - SM 2540 C									
QC Sample ID: BWL0662-BS1	Batch: BWL0662								
Date Prepared: 12/15/2022	Date Analyzed: 12/15/2022								
Total Dissolved Solids (TDS)	94		90 - 110	376			400	20	1.00