Groundwater Monitoring & Corrective Action Report
CCR Landfill - Hunter Power Plant
Castle Dale, Utah

January 2023 - Revised March 2023

Prepared For:
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TABLE OF CONTENTS

1.0 CURRENT STATUS - § 257.90(E)(6) 1

1.1 Summary of Previous Work 1

1.2 Report Purpose and Organization 2

2.0 GROUNDWATER MONITORING NETWORK 3

2.1 Monitoring Well Decommissioning & Replacement in 2022 4

2.2 Additions to the Monitoring Network in 2022 4

3.0 GROUNDWATER MONITORING 4

3.1 Continuation - Assessment / Corrective Measures Monitoring 4

4.0 SELECTION OF REMEDY 5

5.0 REMEDY IMPLEMENTATION 5

6.0 PROBLEMS & RESOLUTIONS 5

7.0 UPCOMING YEAR 6

8.0 REFERENCES 7

9.0 RECORD OF REVISIONS 7

LIST OF FIGURES

Figure 1. Hunter Power Plant CCR Landfill - CCR Sampling Locations

LIST OF TABLES

Table 1. Field and Laboratory Data

Table 2. Summary of Groundwater Quality Comparisons – April/May 2022 Event

Table 3. Summary of Groundwater Quality Comparisons – October 2022 Event

APPENDICES

Attachment A: Field Summary Report – April/May 2022 Event

Attachment B: Field Summary Report – October 2022 Event

Attachment C: Remedy Selection Progress Report - October 2022

ACRONYMS

AMSL	Above Mean Sea Level
bgs	Below Ground Surface
CCR	Coal Combustion Residuals
CFR	U.S. Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
FGD	Flue-Gas Desulfurization
SAP	Sampling and Analysis Plan
SSI	Statistically Significant Increase
UTL	Upper Tolerance Limit
WET	Water and Environmental Technologies

1.0 CURRENT STATUS - § 257.90(e)(6)

This Groundwater Monitoring and Corrective Action Report was prepared for PacifiCorp by Water and Environmental Technologies (WET). It was prepared to comply with the requirements detailed in *Code of Federal Regulations* § 257.90(e) (Coal Combustion Residuals (*CCR) Rule*).

The Hunter Power Plant is located in Emery County, approximately three miles south of Castle Dale, Utah. After dewatering and treatment, Flue Gas De-sulfurization (FGD) waste, fly ash and bottom ash are disposed of in the CCR Landfill. As a result, it is considered a CCR unit. The following provides the status of the groundwater monitoring and corrective action program at the end of 2022.

(i) The CCR Landfill was undergoing assessment / corrective measures monitoring at the start of 2022.
(ii) The CCR Landfill remained in assessment / corrective measures monitoring at the end of 2022.
(iii) Following completion of initial detection monitoring and prior to October 17, 2017, statistically significant increases (SSIs) above site-specific background concentrations were noted for the following Appendix III constituents:
(A) Boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS).
(B) The CCR Landfill program transitioned to assessment monitoring on January 15, 2018. SSIs above groundwater protection standards were noted in 2018 through 2022.
(iv) SSIs above groundwater protection standards were noted for the following Appendix IV constituents in 2022:
(A) Arsenic, Cobalt, lithium, and molybdenum.
(B) An assessment of corrective measures was initiated on January 14, 2019.
(C) A public meeting was held July 23, 2019.
(D) The assessment of corrective measures was completed on June 11, 2019.
(v) A remedy was selected on November 12, 2020.
(vi) A supplemental investigation began in the summer of 2021 and was completed in the summer of 2022 to augment the remedy. A supplemental investigation report will be completed in 2023. The CCR Landfill groundwater monitoring program was transitioned to corrective measures monitoring in November 2020.

1.1 Summary of Previous Work

Detection monitoring was initiated in September of 2015 to ensure a minimum of eight independent measurements were acquired prior to the October 17, 2017 requirement in the CCR Rule. PacifiCorp met this requirement and provided the findings of initial detection monitoring in the first Groundwater Monitoring and Corrective Action Report for the CCR Landfill (WET 2018).

The results of detection monitoring revealed all Appendix III constituents exceeded site-specific background concentrations. Based on these findings, the CCR Landfill monitoring program transitioned to assessment monitoring in 2018. Two rounds of sampling were completed in 2018,

groundwater protection standards were established for the CCR Landfill, and assessment monitoring results were compared to these standards. These comparisons revealed that Appendix IV constituents (lithium and molybdenum) exhibited SSIs above their groundwater protection standards.

Once Appendix IV constituents exhibited SSIs above groundwater protection standards, an investigation to characterize the nature and extent of the release was initiated. An assessment of corrective measures began January 14, 2019 and was completed on June 11, 2019. A public meeting was held in Huntington, Utah on July 23, 2019 to discuss the proposed alternatives and solicit public input. Based on the public input, additional sampling and investigation was conducted to delineate the nature and extent of impacts, and to support the assessment of corrective measures.

Inspections of the current condition and operation of the horizontal well capture system were completed on August 20, 2019, November 12, 2019, and November 2020. Additional groundwater samples collected in 2019 and 2020 were used to further evaluate the effectiveness of the current system and evaluate the need for any further actions.

The Nature and Extent Report was updated with the additional data from the investigations and placed in the plant operating record on August 27, 2020. The Corrective Measures Report was reviewed and based on the additional data, a remedy was selected and placed on the PacifiCorp webpage on November 12, 2020. The Corrective Measures Sampling and Analysis Plan (SAP) was completed in concert with the remedy selection report and was also placed in the Plant operating record October 12, 2020.

1.2 Report Purpose and Organization

The following sections provide a status update for activities initiated or completed at the Hunter Power Plant CCR Landfill during the 2022 monitoring period. They also summarize any issues or problems encountered and their resolutions. Each required element of the annual report is displayed below and is referenced to specific sections of the report where the required information can be found:

- Document the status of the Groundwater Monitoring and Corrective Measures Program;
- Summarize key actions completed;
- Describe any problems encountered;
- Discuss actions taken to resolve problems; and
- Define key activities for the upcoming year.

The Annual Groundwater Monitoring and Corrective Measures Report also includes the following required elements:

- A map showing the CCR unit and all CCR Monitoring Program background (or upgradient) and downgradient monitoring wells, and their identification numbers (Figure 1).

- Identifies any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken.
- A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required for detection or assessment monitoring.
- A narrative discussion of any transition between monitoring programs (i.e. transitioning from detection monitoring to assessment monitoring) - in addition to identifying constituents detected at a statistically significant increase over background levels.
- Other information required to be included as specified in § 257.90 through § 257.98 of the *CCR Rule* not listed above, is also included in the report.

2.0 GROUNDWATER MONITORING NETWORK

The detection / assessment monitoring network for the CCR Landfill was installed using appropriate spacing, location and depth as defined by the Code of Federal Regulations, 40 CFR, Part 257 and 261, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; CCR Rule* § 257.91 (a) (1) and § 257.91 (b) to adequately monitor groundwater both hydraulically upgradient and downgradient of the site.

When installed in 2015, the CCR detection / assessment monitoring network consisted of four upgradient / background wells spanning the extent of the CCR Landfill east to west, and include: ELF-1D, ELF-2, ELF-9, and ELF-10. Downgradient monitoring wells for the CCR Landfill include seven locations placed to capture groundwater as it passes the waste unit boundary along the groundwater flow path which generally travels from west to east as it passes under the CCR Landfill. The downgradient monitoring wells include the following: ELF-3, ELF-4, ELF-5, ELF-6, ELF-7, ELF-8, and ELF-11.

Once SSIs above groundwater protection standards were noted for the CCR Landfill in 2018, an investigation was initiated to determine the nature and extent of impacted groundwater. To augment the initial monitoring network, three new wells were installed in November of 2018 east and downgradient of the CCR Landfill at the Plant boundary. The three wells included: ELF-12, ELF-13, and ELF-14 (Figure 1). These wells were incorporated into the groundwater monitoring program in 2019 and continue to undergo semi-annual monitoring in accordance with the CCR Rule throughout remedy selection and implementation. in the monitoring network throughout active operations and until attainment is reached in downgradient water.

In February of 2022, three new wells were completed downgradient of the Hunter CCR Landfill; ELF-15, ELF-16 and ELF-17 (Figure 1). In addition, ELF-5 and ELF- 6, which were dry, were replaced by ELF-5R and ELF-6R. These wells were incorporated into the groundwater monitoring network in 2022, included in the groundwater elevation maps and analytical results are included in Table 1. Statistical analysis of their analytical results will not be completed until we have a minimum of eight individual samples for validity.

2.1 Monitoring Well Decommissioning & Replacement in 2022

ELF-5 and ELF-6 were replaced in the Hunter Landfill monitoring network in 2022 by ELF-5R and ELF-6R.

2.2 Additions to the Monitoring Network in 2022

ELF-15, ELF-16 and ELF-17 were added to the Hunter Landfill monitoring network in 2022.

3.0 GROUNDWATER MONITORING

The CCR Landfill was transitioned to assessment monitoring in 2018. Two rounds of sampling and analysis were performed annually in 2018 and 2019 to comply with the CCR Rule. Statistical analyses were completed comparing downgradient well results with groundwater protection standards. All of the samples underwent analysis in accordance with the requirements defined in the CCR Rule. In addition, water level and field data were acquired each time the wells were sampled in accordance with the SAP.

With the implementation of the selected remedy, the CCR Landfill monitoring network was transitioned to corrective measures monitoring in November 2020. This program incorporates both the original monitoring network and the additional downgradient wells listed in Section 2.0. All of the network wells were used for the 2022 analysis of compliance with CCR requirements and will remain in the monitoring network throughout active operations and post-closure care / monitoring once the CCR Landfill is closed.

Table 1 provides assessment / corrective measures monitoring data collected for the CCR Landfill in 2022. Attachments A and B contain field summary reports for the April/May and October 2022 sampling events, respectively. They consist of groundwater contour maps, data validation, statistical analyses, field data sheets, and laboratory data packages for each event.

3.1 Continuation - Assessment / Corrective Measures Monitoring

In accordance with the CCR Rule, the CCR Landfill remains in assessment / corrective measures monitoring. Two rounds of groundwater monitoring were completed in 2022 to assess water quality by comparing concentrations in downgradient wells to groundwater protection standards established during assessment monitoring. The comparisons for the April/May and October 2022 sampling events are summarized in Tables 2 and 3.

Table 2 indicates arsenic (ELF-5R, ELF-14), cobalt (ELF-8, and ELF-11), lithium (ELF-14) and molybdenum (ELF-8) exhibited SSIs above their groundwater protection standards for the April/May 2022 event. Table 3 indicates cobalt (ELF-8 and ELF-11), lithium (ELF-14) and molybdenum (ELF-8) exhibited SSIs above their groundwater protection standards for the October 2022 event.

Monitoring well ELF-14 is a downgradient facility bounding well. The lithium concentration in ELF-14 has varied between 4.01 to 4.79 over its 4.5-yr monitoring period. Additional investigation was conducted in 2021 and 2022 as the exceedance could represent a natural variation in background water quality, residual contamination, or other possible scenarios. A Supplemental Investigation Report will be prepared in 2023 detailing findings.

4.0 SELECTION OF REMEDY

The potential remedies for the CCR Landfill at the Hunter Power Plant were assessed in the Corrective Measures Assessment completed in 2019 utilizing the criteria in § 257.96 *Assessment of Corrective Measures.* A public meeting was conducted July 23, 2019 to present the findings of the Nature and Extent Investigation and Corrective Measures Assessment. Public comments were solicited during the meeting and over the ensuing 30 days. Additional site characterization was conducted in 2019 to address the public concerns and to provide supplemental information to aid in selecting a remedy. The remedy for the CCR Landfill at the Plant was selected based on the criteria and evaluation factors in 40 CFR § 257.97 - *Selection of Remedy* and was posted to the Plant operating record on October 12, 2020.

The primary element of the selected remedy is the capture of groundwater through operation of horizontal wells installed beneath the landfill to collect leachate and impacted groundwater. The groundwater capture system at the CCR Landfill has operated since 2015 and has proven effective in reducing groundwater impacts and will remain in place.

A supplemental investigation took place in 2021 and 2022 to determine if the existing horizontal wells require augmentation in order to meet performance criteria. A Supplemental Investigation Report will be prepared in 2023. If additional groundwater capture is deemed necessary, PacifiCorp will proceed with implementation of additional groundwater capture wells, in accordance with the remedy selection report.

5.0 REMEDY IMPLEMENTATION

The horizontal well collection system at the Hunter CCR Landfill has been in operation since 2015 and has continued collection of leachate and impacted groundwater through 2022. Pending the findings of the 2022 supplemental investigation (to be prepared in 2023), the current system may remain as the primary element of the remedy or additional groundwater capture wells will be installed to augment the existing system.

6.0 PROBLEMS & RESOLUTIONS

Monitoring wells ELF-1D (spring and fall), ELF-3 (spring and fall), ELF-10 (spring), and ELF-17 (spring and fall) did not produce sufficient water to support sampling. No other problems were noted during the 2022 monitoring period.

7.0 UPCOMING YEAR

During 2023, it is anticipated PacifiCorp will complete the following activities at the CCR Landfill:

Semi-Annual Monitoring

- Conduct the first semi-annual assessment / corrective measures monitoring event;
- Perform statistical analysis of data;
- Conduct the second semi-annual assessment / corrective measures monitoring event;
- Perform statistical analysis of data; and
- Develop the Annual Groundwater Monitoring and Corrective Action Report.

Corrective Measures

- Provide the results of the Supplemental Investigation
- Continue operating existing horizontal wells;
- Evaluate data to determine if additional corrective measures are appropriate; and
- Implement additional corrective measures, if necessary.

8.0 REFERENCES

EPA 2017. National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA-540-R-201 7-001, January 2017.

EPA 2010. Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater from Monitoring Wells, EPASOP-GW 001, January 2010.

EPA 1989. Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A), EPA/540/1-89/002, December 1989.

WET, 2019. Corrective Measures Assessment, Hunter Power Plant, Castle Dale, Utah. June 2019.

WET, 2017. Sampling and Analysis Plan & Well Documentation, CCR Landfill – Hunter Power Plant, Castle Dale, Utah, Revision 1, October 2017.

9.0 RECORD OF REVISIONS

In March 2023, Table 2 and Table 3 of this report were revised. In Table 2, the UTLs and GPLs for chromium, lithium and radium were updated and ELF-5R and ELF-14 were added to the exceedance list for arsenic. On Table 3, the UTLs and GPLs for fluoride (App. IV), lithium and radium were updated and ELF-5R and ELF-14 were deleted from the exceedance list for arsenic.

FIGURES

Monitoring Network Wells

Monitoring Network Wells - Abandoned

N

W E

S

0 450 900 1,800 2,700 Feet

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Water & Environmental TECHNOLOGIES

HUNTER POWER PLANT

CCR Sample Locations

Job#: PERCM052

Date: 1/20/2023

FIGURE 1

Path: M:\PERC\PERC_CCR\GIS\2022_CCR_Sampling\Hunter\GIS\CCR_Sample_Locations.aprx, Author: jhulla

TABLES

Table 1. Hunter Power Plant - **CCR** Landfill Assessment Monitoring Results

| SAMPLE ID | WELL TYPE | COLLECTION DATE | TOC AMSL (ft) | DTW (ft) | GWE AMSL (ft) | Appendix III | | |

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Table 1. Hunter Power Plant - **CCR** Landfill Assessment Monitoring Results

| SAMPLE ID | WELL TYPE | COLLECTION DATE | TOC AMSL (ft) | DTW (ft) | GWE AMSL (ft) | Appendix III | | |

Table 2. Summary of Groundwater Quality Comparisons – April/May 2022 Event

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	None Exceed
Arsenic	0.0117	0.01	0.0117	ELF-5R, ELF-14
Barium	0.102	2.0	2.0	None Exceed
Beryllium	0.002	0.004	0.004	None Exceed
Cadmium	0.0011	0.0050	0.0050	None Exceed
Chromium	0.020	0.1000	0.1000	None Exceed
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride App IV	4.36	4.0	4.36	None Exceed
Lead	0.012	0.015	0.015	None Exceed
Lithium	4.28	0.04	4.28	ELF-14
Mercury	0.0002	0.002	0.002	None Exceed
Molybdenum	0.158	0.100	0.158	ELF-8
Radium	6.2	5.0	6.2	None Exceed
Selenium	0.608	0.050	0.608	None Exceed
Thallium	0.002	0.002	0.002	None Exceed

Table 3. Summary of Groundwater Quality Comparisons – October 2022 Event

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	None Exceed
Arsenic	0.0117	0.01	0.0117	None Exceed
Barium	0.102	2.0	2.0	None Exceed
Beryllium	0.002	0.004	0.004	None Exceed
Cadmium	0.0011	0.0050	0.0050	None Exceed
Chromium	0.020	0.1000	0.1000	None Exceed
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride App IV	4.18	4.0	4.18	None Exceed
Lead	0.012	0.015	0.015	None Exceed
Lithium	4.18	0.04	4.18	ELF-14
Mercury	0.0002	0.002	0.002	None Exceed
Molybdenum	0.158	0.100	0.158	ELF-8
Radium	6.2	5.0	6.2	None Exceed
Selenium	0.608	0.050	0.608	None Exceed
Thallium	0.002	0.002	0.002	None Exceed

ATTACHMENT A:

Field Summary Report – April/May 2022 Event

Facility Name: Hunter Power Plant – CCR Landfill
Event Description: Assessment Monitoring
Event Dates: April 6-7 & May 4-5, 2022
Field Personnel: Dennis Vanderbeek, Brad Giles

ACTIVITY SUMMARY. PacifiCorp personnel arrived onsite April 6, 2022 and performed groundwater sampling at Hunter CCR Landfill. Prior to collecting samples, field instruments were calibrated, followed by the collection of water levels in the CCR monitoring wells. After recording water levels, the wells were purged in accordance with the EPA low-flow method. Field parameters were monitored during well purging in accordance with the site-specific sampling and analysis plan (SAP). Once field parameters met the SAP stabilization requirements, groundwater samples were collected for Appendix III and Appendix IV constituents. All calibration data and field measurements were recorded on the WET electronic field form. The wells that underwent sampling during this sampling event included:

- ELF-10
- ELF-11
- ELF-12
- ELF-13
- ELF-14
- ELF-1D
- ELF-2
- ELF-3
- ELF-4
- ELF-5R
- ELF-6R
- ELF-7
- ELF-8
- ELF-9
- ELF-15
- ELF-16
- ELF-17

The following details dates for conducting field work and post-field work data processing:

- Date fieldwork completed: 4/7/2022 & 5/5/2022
- Dates unvalidated lab data received: 4/21/2022 & 6/16/2022
- Data validation completion date: 8/17/2022

After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to Chemtech-Ford Laboratories in Sandy, Utah. Chemtech-Ford subcontracts radium analysis to a third-party laboratory. During transit from Chemtech-Ford to their subcontracted laboratory, the cooler containing radium samples for wells ELF-8, ELF-9, ELF-11, ELF-12, and ELF-13 was lost. These wells were resampled for radium only from May 4-5. This resampling effort did not include collection of duplicate or blank samples. Samples arrived at Chemtech-Ford on 4/8/2022. Chemtech-Ford subcontracted Radium analyses to ALS Global in Fort Collins, Colorado. Samples arrived at ALS on 4/18/2022 & 5/11/2022. The following information is attached to this summary as a supplement:

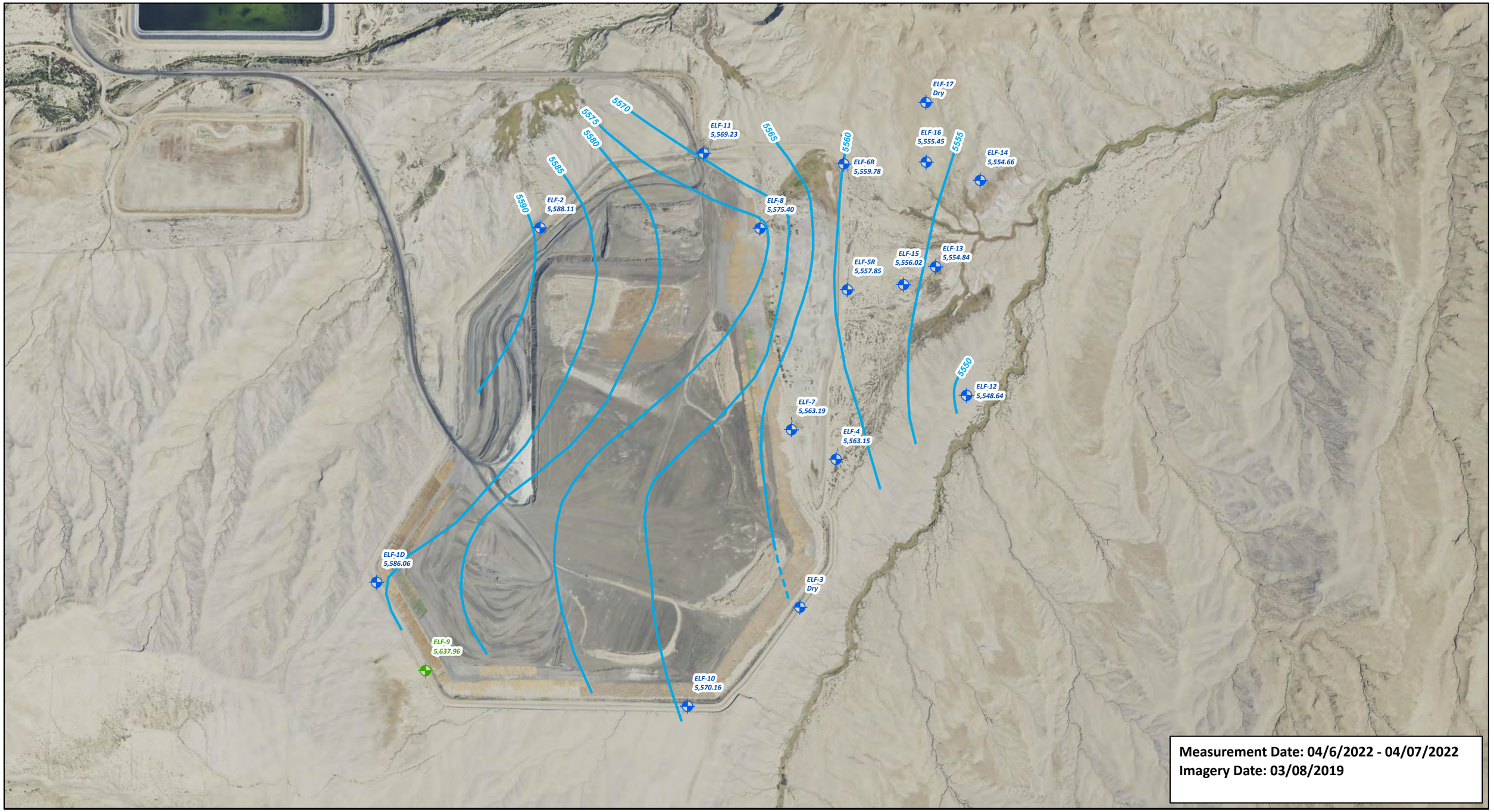
- Attachment A: Groundwater Contour Map
- Attachment B: Data Validation Summary
- Attachment C: Statistical Analysis
- Attachment D: Field Data Sheets
- Attachment E: Laboratory Analytical Reports

SAP DEVIATIONS. Wells ELF-3, ELF-10, ELF-17 and ELF-1D did not have enough water to sample.

NOTE. Wells ELF-15, ELF-16, and ELF-17 are new wells and do not have eight samples yet. Therefore, these wells were not included in the statistical analysis.

Attachment A:

Groundwater Contour Map



ELF-1D = Well ID
5,586.06 = Water Level Elevation (ft.)

- CCR Well
- CCR Well - For Water Quality Only
- Groundwater Elevation Contour (Contour Interval = 5 ft.)
- Inferred Groundwater Elevation Contour (Contour Interval = 5 ft.)

N
W E
S

0 500 1,000 2,000 3,000 Feet

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HUNTER POWER PLANT

Groundwater Elevation Map CCR Landfill - Spring 2022

Job#: PERCM052

Date: 8/22/2022

Attachment A

Path: M:\PERC\PERC_CCR\GIS\2022_CCR_Sampling\Hunter\GIS\2022_CCR_Sampling\2022_CCR_Sampling.aprx, Author: jhulla

Attachment B:

Data Validation Summary

DATA VALIDATION SUMMARY
CCR COMPLIANCE SAMPLING

Facility Name:	Hunter Power Plant	
Validator:	Christina Eggensperger (08/09/2022)	
Reviewer:	Janelle Garza (8/17/2022)	
Laboratories:	Chemtech-Ford Laboratories; Salt Lake City, UT ALS Laboratories; Fort Collins, CO (third party lab for Ra analyses)	
Laboratory Work Order# and Sample IDs:	22D0654: CCR 22D0656: Radium analyses for ELF-2, ELF-4, ELF-5R, ELF-6R, ELF-7, ELF-14, ELF-15, ELF-16, Duplicate – (CCR), Field Blank – (CCR) 22E0465: Radium analyses for ELF-8, ELF-9, ELF-11, ELF-12, ELF-13	
Collection Date(s):	April 6-7 and May 4-5, 2022	
Sample Media:	Aqueous (groundwater)	
Analytical Parameters:	**Inorganic** • Chloride, Fluoride, and Sulfate by EPA 300.0 • pH by SM 4500 H-B • Total Dissolved Solids (TDS) by SM 2540 C **Total Metals by EPA 200.7/8** • Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Lead (Pb), Lithium (Li), Molybdenum (Mo), Selenium (Se), and Thallium (Tl) **Total Mercury (Hg) by EPA 245.1** **Radium** • Radium-226 by EPA 903.1 • Radium-228 by EPA 904.0	
Review Element:	**Complete / Criteria Met? (Yes/No)**	**If no, describe:**
Chain of Custody:	Yes	During transit from Chemtech-Ford to their subcontracted laboratory, the cooler containing radium samples for wells ELF-8, ELF-9, ELF-11, ELF-12, and ELF-13 was lost. These wells were resampled for radium only from May 4-5. This resampling effort did not include collection of duplicate or blank samples.
Field Documentation:	Yes	
Holding Times & Sample Preservation:	No	Holding Time pH in all samples was analyzed past the 15-minute holding time. However, lab pH was compared to final stabilized field pH. If the lab pH was within +/-0.10 of the final stabilized field pH, then the lab pH was considered acceptable. ❖ The Field Blank – (CCR), consistent of deionized (DI) water, was within an acceptable pH range of 5.5 to 7.0; therefore, no qualification was required. ❖ ELF-13 was qualified as estimated low (J-). ❖ ELF-11, ELF-12, ELF-15, ELF-16, and Duplicate – (CCR) were qualified as estimated high (J+).

		❖ No qualification was required for all remaining samples.
Calibrations:	Yes	
Blanks:	No	Field Field Blank – (CCR): representing the entire sample group. ❖ TDS was detected at 28 mg/L, above the RL of 20 mg/L. ➢ No qualification was necessary for any samples due to all results ≥10x the field blank value. ❖ Ra-226 was detected at 0.37 pCi/L, above the MDC of 0.25 pCi/L. ➢ ELF-2, ELF-4, ELF-6R, ELF-15, ELF-9, ELF-11, and ELF-12 were qualified as ND (U) by the lab due to results ≤MDC. ➢ ELF-5R, ELF-7, ELF-14, ELF-16, Duplicate – (CCR), ELF-8, and ELF-13 were qualified as estimated ND (UJ) due to results >MDC, mean differences <3, and difference factors <10. Laboratory Method EPA 200.7 ❖ Batch BWD0544: ELF-2, ELF-5R, ELF-7, ELF-11, ELF-14 ➢ Lithium was detected at 0.005 mg/L, equal to the RL. ▪ No qualification was necessary for any samples due to all results ≥10x the method blank value.
Laboratory Control Sample:	Yes	
Duplicates:	No	Field ELF-5R (original) and Duplicate – (CCR) (duplicate): representing the entire sample group. ❖ Arsenic RPD was 142%, above the 20% limit. The original sample result was ≥5x the RL while the duplicate was <5x the RL, and the absolute difference between them was > the RL. ➢ Field Blank – (CCR) was qualified as estimated ND (UJ). ➢ All remaining samples were qualified as estimated detections (J). ❖ Cadmium: The original sample result was detected while the duplicate sample result was ND and replaced with zero to give a 200% RPD, above the 20% limit. Both the original and duplicate sample results were <5x the RL, but the absolute difference between them was ≤ the RL. No qualification was required.

		❖ Cobalt RPD was 24%, above the 20% limit. Both the original and the duplicate sample results were ≥5x the RL. ➢ ELF-12 and Field Blank – (CCR) were qualified as estimated ND (UJ). ➢ All remaining samples were qualified as estimated detections (J). ❖ Selenium RPD was 132%, above the 20% limit. Both the original and the duplicate sample results were ≥5x the RL. ➢ Field Blank – (CCR) was qualified as estimated ND (UJ). ➢ All remaining samples would have been qualified as estimated detections (J), but were also more specifically qualified as estimated low (J-) due to low MS recovery. ❖ Chloride RPD was 30%, above the 20% limit. The original sample result was <5x the RL while the duplicate was ≥5x the RL, and the absolute difference between them was > the RL. ➢ Field Blank – (CCR) was qualified as estimated ND (UJ). ➢ All remaining samples were qualified as estimated detections (J). ❖ Sulfate RPD was 25%, above the 20% limit. Both the original and the duplicate sample results were ≥5x the RL. ➢ Field Blank – (CCR) was qualified as estimated ND (UJ). ➢ All remaining samples were qualified as estimated detections (J), but were also more specifically qualified as estimated low (J-) due to low MS recovery. ❖ TDS RPD was 26%, above the 20% limit. Both the original and the duplicate sample results were ≥5x the RL. ➢ All samples were qualified as estimated detections (J). ❖ Radium 226 RPD was 45%, above the 20% limit. The mean difference between the original and duplicate samples was below the limit of 3. Therefore, no qualification was required. <u>Laboratory</u> Method SM 2540 C ❖ Batch BWD0523: all samples except ELF-14, ELF-15, and ELF-16

		➢ QC Sample ID BWD0523-DUP1 (unassociated work order) ▪ TDS RPD was 14%, above the 10% limit. Both the original and duplicate sample results were ≥5x the RL. • All samples were qualified as estimated detections (J).
Matrix Spike:	No	Method EPA 200.7 ❖ Batch BWD0544: ELF-2, WLF-5R, ELF-7, ELF-11, ELF-14 ➢ QC Sample ID BWD0544-MS1: Sample ID ELF-2 ▪ Calcium was recovered at -30.3% (MS) and -65.6% (MSD), below the 70-130% control limits. • The lab flagged these as 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. ♦ No qualification. ▪ Lithium was recovered at 49.8% (MSD), below the 70-130% control limits. • The lab flagged this as 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. ♦ Due to professional judgment, the batch will still be qualified based on the low MSD recovery. ✓ All samples were qualified as estimated low (J-) due to detected results. ➢ QC Sample ID BWD0544-MS2 (unassociated work order) ▪ Calcium was recovered at 132% (MS), above the 70-130% control limits. • The lab flagged these as 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.

		♦ No qualification. ❖ Batch BWD0762: ELF-8, ELF-9, ELF-13, Field Blank – (CCR) ➢ QC Sample ID BWD0762-MS2 (unassociated work order) ▪ Calcium was recovered at 69.3% (MS) and 57.2% (MSD), below the 70-130% control limits. • The lab flagged these as 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. ♦ No qualification. Method EPA 200.8 ❖ Batch BWD0759: ELF-8, ELF-9, ELF-13, Field Blank – (CCR) ➢ QC Sample ID BWD0759-MS1 (unassociated work order) ▪ Selenium was recovered at 21% (MS), below the 70-130% control limits. • The lab flagged these as 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. ♦ Due to professional judgment, the batch will still be qualified based on the low MS recovery. ✓ Field Blank – (CCR), consistent of deionized (DI) water, was excluded from evaluation due to the known potential matrix interference between DI water and the aqueous matrix. ✓ All remaining samples were qualified as estimated low (J-) due to detected results. Method EPA 300.0 ❖ Batch BWD0459: ELF-4, ELF-5R, ELF-6R, ELF-7, ELF-8, ELF-11, ELF-13, ELF-14, ELF-15, ELF-16, Duplicate – (CCR), Field Blank – (CCR)

		➢ QC Sample ID BWD0459-MS1: Sample ID ELF-2 ▪ Fluoride was recovered at 72.8% (MSD), below the 80-120% control limits. • The lab flagged these as 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. ♦ Due to professional judgment, the batch will still be qualified based on the low MSD recovery. ✓ Field Blank – (CCR), consistent of deionized (DI) water, was excluded from evaluation due to the known potential matrix interference between DI water and the aqueous matrix. ✓ All remaining samples were qualified as estimated ND (UJ). ▪ Sulfate was recovered at 76.2% (MS) and 78.5% (MSD), below the 80-120% control limits. • The lab flagged these as 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. ♦ Due to professional judgment, the batch will still be qualified based on the low MSD recovery. ✓ Field Blank – (CCR), consistent of deionized (DI) water, was excluded from evaluation due to the known potential matrix interference between DI water and the aqueous matrix. ✓ All remaining samples were qualified as estimated low (J-) due to detected results. ➢ QC Sample ID BWD0459-MS2: Sample ID Field Blank – (CCR) ▪ Field blanks, consistent of deionized (DI) water, are not recommended for use as a

		parent sample in MS/MSD tests due to the known potential interference between DI and other liquid matrices. The minimum requirement of one MS/MSD per 20 samples was met with the previous MS/MSD (QC Batch ID BWD0459-MS1); therefore, the following MS/MSD failures will not be evaluated. • Fluoride was recovered at 75.4% and 74.4% (MSD), below the 80-120% control limits. ♦ The lab flagged these as 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 was recovered at 77.3% (MS) and 77.7% (MSD), below the 80-120% control limits. ♦ The lab flagged these as 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.
Overall Assessment:		
Out of 330 total data points from all three lab reports, 211 data points (63.9%) remain unqualified, or were qualified as ND (U), and are considered quantitative data. The remaining 119 data points (36.1%) were qualified as estimated due to holding time exceedance, field blank contamination, poor field replication, and poor laboratory accuracy and precision, and are considered qualitative data. No data points were rejected; thus, this sample delivery group is 100% complete and usable.		

Attachment C:

Statistical Analysis

CONTENTS

1.0 INTRODUCTION 1

2.0 PRELIMINARY DATA ANALYSIS 1

2.1 Data Analysis Techniques 2

2.1.1 Mean 2

2.1.2 Standard Deviation 2

2.1.3 Coefficient of Variance 3

2.1.4 Quartiles and the Five Number Summary 3

2.2 Visual Tools 3

2.2.1 Histograms 3

2.2.2 Dot Plots 4

2.2.3 Outliers 5

2.2.4 Treatment of Non-Detects 6

2.3 Summary Results 6

3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON 12

3.1 Groundwater Protection Standards 12

3.1.1 Normal Distribution 13

3.1.2 Upper Tolerance Limits and Groundwater Protection Standard 14

4.0 CONCLUSIONS 15

5.0 REFERENCES 16

LIST OF FIGURES

Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells

Figure C.2. Dot plot of fluoride data from the CCR Landfill upgradient wells

Figure C.3. Histograms and dot plots for the upgradient CCR Landfill data

Figure C.4. Background upper tolerance limit plots for the CCR Landfill

LIST OF TABLES

Table C.1. Upgradient and downgradient wells for the CCR Landfill

Table C.2. Summary statistics for the CCR Landfill upgradient wells

Table C.3. Five-number summary for the CCR Landfill upgradient wells

Table C.4. Shapiro-Wilk Test for the CCR Landfill upgradient wells

Table C.5. Comparison of downgradient well results to background and groundwater protection standards

1.0 INTRODUCTION

This appendix contains a statistical analysis of the data collected from the groundwater monitoring wells associated with the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah in April of 2022. Methods used to compare upgradient with downgradient wells vary depending on the characteristics of the upgradient well data. Upgradient well data were analyzed for outliers, normality, non-detects, and other characteristics that affect the comparison measures. A comprehensive statistical analysis is presented along with a discussion of the methods used to compare upgradient with downgradient water quality. Table C.1 lists the upgradient and downgradient wells that are used in this analysis. Note that if a well appears in Table C.1 and not in the tables and figures in this appendix it means that no samples were able to be collected from that well.

Table C.1. Upgradient and downgradient wells for the CCR Landfill.

Upgradient Well	Downgradient Well
ELF-1D	ELF-11
ELF-2	ELF-12
ELF-9	ELF-13
ELF-10	ELF-14
	ELF-3
	ELF-4
	ELF-5
	ELF-6
	ELF-5R
	ELF-6R
	ELF-7
	ELF-8

2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of this statistical analysis is to establish background values from the upgradient well data and compare these to the downgradient well data to determine if the downgradient water quality has been impacted by the CCR Landfill. Familiarity with numerical and distributional characteristics of the upgradient wells aids in computing appropriate limits and in correctly interpreting those limits. This section contains a statistical summary of the upgradient well data. It is essential to understand the statistical characteristics of the data, prior to making the upgradient / downgradient well comparison. This understanding helps to ensure the appropriate calculations have been done and comparisons are completed using the proper statistical measures. The mean, standard deviation, quartiles, and other statistical quantities and corresponding graphs are presented in the following sections.

2.1 Data Analysis Techniques

The following sections summarize the statistical tools and techniques, used to evaluate upgradient well data from the CCR Landfill.

2.1.1 Mean

One measure of primary interest is the center of the data. The average ($\overline{x}$), or the mean, is the most commonly used measure of the central tendency of the data. However, it can be heavily influenced by outliers and by asymmetric data. The mean is calculated using Equation (1):

$$\overline{x} = \frac{\sum_{i=1}^{n} x_i}{n} \quad (1)$$

Where:

$\overline{x}$ = mean

n = number of observations

x_i = i^{th} observation.

2.1.2 Standard Deviation

Another quantity of interest is the spread of the data. The standard deviation (s) is the most commonly used measure of spread, as it is easy to interpret and is used in many other statistical methods. Because it is calculated using the average, it is also sensitive to outliers and affected by data that are not symmetric. The standard deviation is calculated using Equation (2):

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \overline{x})^2}{n-1}} \quad (2)$$

Where:

s = standard deviation

n = number of observations

x_i = i^{th} observation

$\overline{x}$ = mean of the observations.

2.1.3 Coefficient of Variance

The coefficient of variance (CV) is a relative measure of variation in the sample data which expresses the standard deviation relative to the mean. The CV is expressed as a percentage and provides a direct comparison to the standard deviations of two different data sets. It is important to note the mean of the data may be very close to or very far away from zero and the spread may be independent of the distance from the mean to zero. Therefore, no firm guidelines have been established for interpreting the CV.

The CV was calculated for each detected analyte in each data grouping using Equation (3):

$$CV = \frac{s}{\bar{X}} \times 100\% \quad (3)$$

Where:

s = standard deviation

$\bar{X}$ = mean of the observations

2.1.4 Quartiles and the Five Number Summary

The five-number summary is a set of five numbers that are used to assess the spread of the data. It consists of the minimum value, first quartile, median, third quartile, and maximum of the data value. The first quartile is the 25th percentile of the data, the median is the 50th percentile of the data, and the third quartile is the 75th percentile of the data. The 25th percentile of the data is the number such that 25% of the data are less than that number and 75% of the data are above the 25th percentile. The median and third quartiles are found in a similar manner.

2.2 Visual Tools

It is difficult to review numerical summary statistics and identify the degree of symmetry or normality of data without the aid of visual tools. In completing the statistical analysis for the CCR Landfill, histograms and dot plots were developed for each of the analytes with at least one detectable observation. All graphs were developed using the R Statistical Package (R Core Team 2022).

2.2.1 Histograms

Histograms display the distribution and symmetry of the data. The data are displayed in such a way, that deviations from a normal (i.e., bell shaped) distribution can easily be observed. Outliers are also often identifiable in a histogram. Histograms for the upgradient wells were generated using both non-detects and detected results. The method detection limits (MDL) are plotted on the histogram with a blue line to show which observations are non-detects.

If an analyte has more than one MDL there will be more than one blue line on the histogram. Figure C.1 below is a histogram of fluoride data for the upgradient wells for the CCR Landfill. It

is provided here to illustrate data distribution using a histogram. All of the histograms used to examine the analytes from the CCR Landfill upgradient well data, are provided at the end of this appendix in Figure C.3.

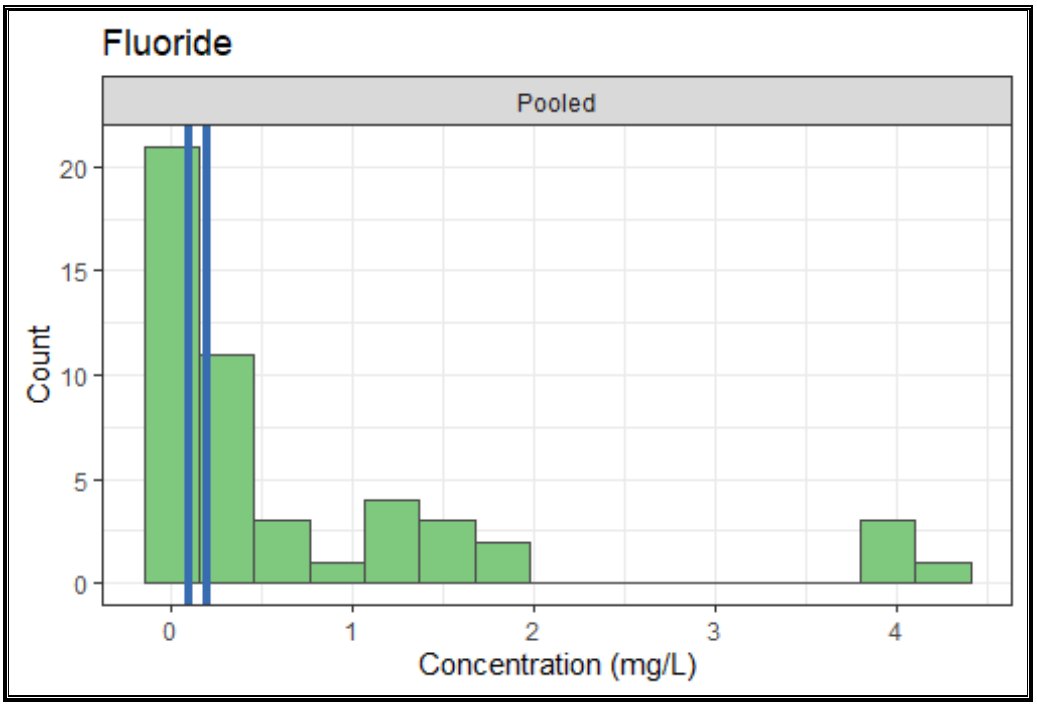


Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells.

2.2.2 Dot Plots

A dot plot is a graphical tool used to determine the spread of the data and to look for outliers. Each measured concentration is plotted on the graph so that non-detects and outliers are clearly visible. The MDL for non-detects are shown as green points on the plot. Figure C.2 uses the same fluoride data points used to develop the Figure C.1. Several of the points are non-detects and the concentrations in well ELF-10 are larger than those in the other wells. All of the dot plots used to examine the CCR Landfill upgradient well data are provided at the end of this appendix in Figure C.3.

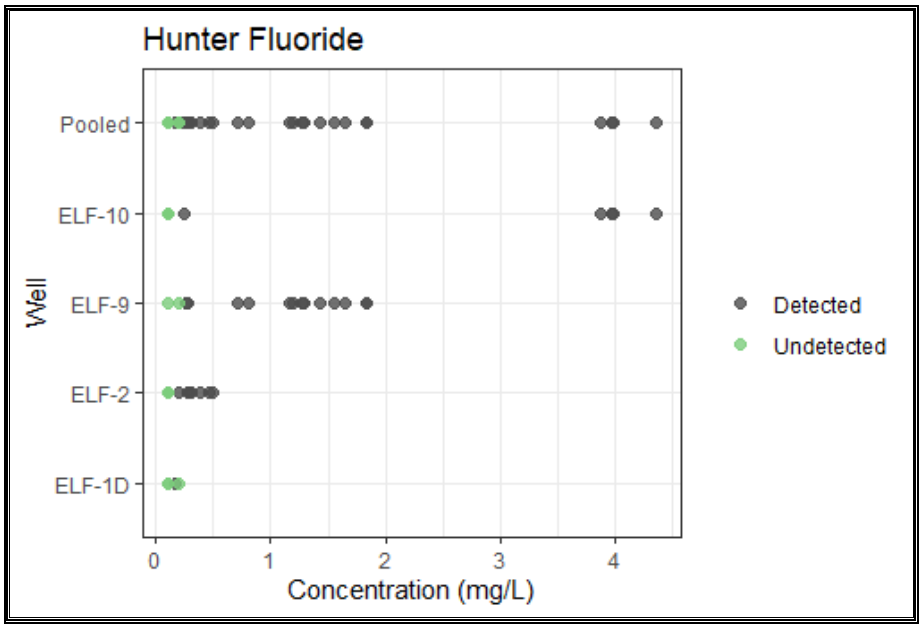


Figure C.2. Dot plot of fluoride data the CCR Landfill upgradient wells

2.2.3 Outliers

Outliers are data points that are notably larger or smaller than the rest of the data set and may indicate a problem with the data point or the data set as a whole. Examples which may be indicative of outliers include: 1) a misreported or erroneous concentration, 2) analytical error(s), or 3) natural variations in groundwater concentrations. Outliers are generally not omitted from project data simply because they are outliers. Rather, the result is examined individually or by project, to ensure the outlier does not represent an erroneous result or another concern warranting either additional sampling or omission of the outlier from the data analysis. There are reasonable situations when it is appropriate to remove outliers. For example, if outliers which represent exceedingly low concentrations are used to compute background concentrations, they may result in background levels which are too conservative. Conversely, use of excessively high outlier concentrations to compute background values, may result in an overestimation of background concentrations resulting in false-negative comparisons for downgradient groundwater quality.

Outliers were detected in the boron, cadmium, fluoride, lead, and radium data CCR Landfill data. However, none of the outliers are extreme enough to warrant removal from the dataset. The MDLs for the non-detects in the boron upgradient data in February 2016 and August 2019 were 5 mg/L and the largest detected value was less than 4 mg/L. This is an unusually large MDL and its inclusion would have resulted in a Groundwater Protection Standard (GWPS) that was larger than any concentration detected in the upgradient wells. Thus, the non-detects were removed from the upgradient boron data and are not included in any tables or graphs in this appendix. The fluoride data for the May 2022 sampling event were all non-detects with unusually high detection limits so they were not included in the analysis. Fluoride will be reassessed during the Fall 2022 sampling event.

2.2.4 Treatment of Non-Detects

Non-detect values are common in environmental data. When present in data sets, non-detects produce difficulties in computing statistical metrics because reliable values cannot be assigned. Substituting a value such as the MDL or one-half of the MDL for non-detects are common practices. However, use of the detection limit, or one-half of the detection limit, can produce unstable or unreliable results (EPA 2009). Statistical methods, such as Kaplan-Meier (Helsel 2004), can be used to appropriately evaluate data sets containing significant quantities of non-detects, by producing estimates of the survival probability function for non-detects. These estimates can then be used to compute summary statistics on the data set. However, Kaplan-Meier does not perform well if more than 50% of the results are non-detects or if fewer than eight detections are available for evaluation.

The antimony, arsenic, cadmium, chromium, cobalt, and lead data have more than 50% non-detects. Beryllium, mercury, and thallium were not detected in any of the samples. Thus, statistical analysis cannot be done for those analytes. The fluoride and selenium data have more than 15% non-detects, but more than half of the data are detected. As a result, Kaplan-Meier was used to compute means, standard deviations, and statistical limits used to compare the upgradient to downgradient water quality for fluoride and selenium.

2.3 Summary Results

Table C.2 provides summary statistics for the CCR Landfill upgradient well data. Although the data from the upgradient wells were combined when compared to the downgradient wells, the summary statistics presented in this section are separated by well and are presented as pooled data. The data are presented in this way, due to observed differences between the different wells for many of the analytes. These tables in conjunction with the histograms and normal-quantile plots, provide information about differences between wells and the data properties of the combined data. Note that summary stats were only computed for analytes and wells with at least 50% detects and at least eight detected samples. Analytes that were not detected in any upgradient well samples are not listed in Table C.2.

Table C.2. Summary statistics for the CCR Landfill upgradient wells

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Antimony	ELF-1D	5	0	<0.004	NA	NA	NA
Antimony	ELF-2	19	0	<0.002	NA	NA	NA
Antimony	ELF-9	17	1	<0.002	NA	NA	NA
Antimony	ELF-10	14	0	<0.002	NA	NA	NA
Antimony	Pooled	55	1	<0.002	NA	NA	NA
Arsenic	ELF-1D	5	0	<0.002	NA	NA	NA
Arsenic	ELF-2	19	1	<0.002	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Arsenic	ELF-9	17	17	0.0067	0.0071	0.0021	30
Arsenic	ELF-10	14	3	<0.002	NA	NA	NA
Arsenic	Pooled	55	21	<0.002	NA	NA	NA
Barium	ELF-1D	5	5	0.0103	NA	NA	NA
Barium	ELF-2	19	18	0.0102	0.0131	0.0094	72
Barium	ELF-9	17	17	0.0165	0.0351	0.0320	91
Barium	ELF-10	14	14	0.0341	0.0384	0.0222	58
Barium	Pooled	55	54	0.0134	0.0260	0.0245	94
Boron	ELF-1D	4	4	2.15	NA	NA	NA
Boron	ELF-2	18	18	3.32	3.33	0.18	5.48
Boron	ELF-9	15	15	1.39	1.46	0.21	14.39
Boron	ELF-10	13	13	1.60	1.65	0.17	10.43
Boron	Pooled	50	50	1.86	2.24	0.87	38.79
Cadmium	ELF-1D	5	0	<0.0005	NA	NA	NA
Cadmium	ELF-2	19	0	<0.0005	NA	NA	NA
Cadmium	ELF-9	17	1	<0.0005	NA	NA	NA
Cadmium	ELF-10	14	6	<0.0005	NA	NA	NA
Cadmium	Pooled	55	7	<0.0005	NA	NA	NA
Calcium	ELF-1D	4	4	372	NA	NA	NA
Calcium	ELF-2	18	18	399	399	22	5
Calcium	ELF-9	16	16	60	72	30	41
Calcium	ELF-10	13	13	474	476	34	7
Calcium	Pooled	51	51	393	314	170	54
Chloride	ELF-1D	4	4	6760	NA	NA	NA
Chloride	ELF-2	18	18	397	342	122	35.80
Chloride	ELF-9	16	16	404	410	90	22.06
Chloride	ELF-10	13	13	7530	8627	2349	27
Chloride	Pooled	51	51	461	2981	3925	131.70
Chromium	ELF-1D	5	1	<0.002	NA	NA	NA
Chromium	ELF-2	19	2	<0.002	NA	NA	NA
Chromium	ELF-9	17	7	<0.002	NA	NA	NA
Chromium	ELF-10	14	10	0.0027	0.0046	0.0040	86
Chromium	Pooled	55	20	<0.002	NA	NA	NA
Cobalt	ELF-1D	5	1	<0.004	NA	NA	NA
Cobalt	ELF-2	19	11	0.0048	0.0055	0.0020	37

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Cobalt	ELF-9	17	3	<0.004	NA	NA	NA
Cobalt	ELF-10	14	10	0.0043	0.0049	0.0014	27.56
Cobalt	Pooled	55	25	<0.004	NA	NA	NA
Fluoride	ELF-1D	4	1	<0.13	NA	NA	NA
Fluoride	ELF-2	17	9	0.10	0.20	0.14	70.38
Fluoride	ELF-9	15	13	1.19	1.04	0.61	58.57
Fluoride	ELF-10	13	5	<0.1	NA	NA	NA
Fluoride	Pooled	49	28	0.20	0.75	1.12	149.55
Lead	ELF-1D	5	0	<0.002	NA	NA	NA
Lead	ELF-2	19	1	<0.002	NA	NA	NA
Lead	ELF-9	17	4	<0.002	NA	NA	NA
Lead	ELF-10	14	6	<0.002	NA	NA	NA
Lead	Pooled	55	11	<0.002	NA	NA	NA
Lithium	ELF-1D	5	5	2.19	NA	NA	NA
Lithium	ELF-2	19	19	1.75	2.27	1.15	51
Lithium	ELF-9	17	17	0.944	1.05	0.430	41
Lithium	ELF-10	14	14	2.18	2.37	1.02	43
Lithium	Pooled	55	55	1.61	1.92	1.05	55
Molybdenum	ELF-1D	5	5	0.0161	NA	NA	NA
Molybdenum	ELF-2	19	18	0.0030	0.0031	0.0007	23
Molybdenum	ELF-9	17	17	0.1090	0.1007	0.0333	33
Molybdenum	ELF-10	14	14	0.0825	0.0778	0.0369	47
Molybdenum	Pooled	55	54	0.0445	0.0534	0.0504	94
pH	ELF-1D	4	4	7.22	NA	NA	NA
pH	ELF-2	18	18	7.26	7.30	0.162	2
pH	ELF-9	16	16	7.94	7.93	0.156	2
pH	ELF-10	13	13	7.21	7.29	0.414	6
pH	Pooled	51	51	7.34	7.49	0.387	5
Radium	ELF-1D	5	5	2.20	NA	NA	NA
Radium	ELF-2	19	19	1.49	1.91	1.65	86
Radium	ELF-9	17	16	1.38	1.46	0.586	39.98
Radium	ELF-10	14	14	2.40	3.01	3.36	112
Radium	Pooled	55	54	1.63	2.09	2.05	98
Selenium	ELF-1D	5	0	<0.002	NA	NA	NA
Selenium	ELF-2	19	19	0.198	0.251	0.233	93

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Selenium	ELF-9	17	2	<0.002	NA	NA	NA
Selenium	ELF-10	14	9	0.0086	0.0820	0.1287	157
Selenium	Pooled	55	30	0.0042	0.1087	0.1844	170
Sulfate	ELF-1D	4	4	8790	NA	NA	NA
Sulfate	ELF-2	18	18	7925	7709	705	9
Sulfate	ELF-9	16	16	6640	6592	732	11
Sulfate	ELF-10	13	13	16800	15004	4859	32
Sulfate	Pooled	51	51	7950	9319	4220	45
TDS	ELF-1D	4	4	26900	NA	NA	NA
TDS	ELF-2	18	18	12000	11956	402	3
TDS	ELF-9	16	16	10650	10776	744	7
TDS	ELF-10	13	13	38200	37469	2482	7
TDS	Pooled	51	51	12000	19259	11616	60

Table C.3 provides the five-number summaries for the CCR Landfill upgradient wells. As with the summary statistics, a five-number summary was computed for each well as well as for the pooled data. If a minimum or a quartile falls within the range of non-detects it is denoted using a less-than (<) symbol. Analytes that were not detected in any of the upgradient well samples are not listed in Table C.3.

Table C.3. Five-number summary for the CCR Landfill upgradient wells.

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Antimony	ELF-1D	<0.002	<0.004	<0.004	<0.004	<0.004
Antimony	ELF-2	<0.0005	<0.002	<0.002	<0.004	<0.004
Antimony	ELF-9	<0.001	<0.002	<0.002	<0.004	0.004
Antimony	ELF-10	<0.001	<0.002	<0.002	<0.0035	<0.004
Antimony	Pooled	<0.0005	<0.002	<0.002	<0.004	0.004
Arsenic	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	ELF-2	<0.0009	<0.002	<0.002	<0.002	0.002
Arsenic	ELF-9	0.0044	0.0055	0.0067	0.0076	0.0117
Arsenic	ELF-10	<0.002	<0.002	<0.002	<0.002	0.0093
Arsenic	Pooled	<0.0009	<0.002	<0.002	0.0053	<0.002
Barium	ELF-1D	0.0084	0.0085	0.0103	0.0103	0.0104
Barium	ELF-2	<0.0084	0.0096	0.0102	0.0120	0.0500

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Barium	ELF-9	0.0118	0.0126	0.0165	0.0411	0.1020
Barium	ELF-10	0.0145	0.0189	0.0341	0.0515	0.0863
Barium	Pooled	<0.0084	0.0104	0.0134	0.0338	0.1020
Boron	ELF-1D	1.94	2.06	2.15	2.20	2.23
Boron	ELF-2	3.11	3.20	3.32	3.46	3.77
Boron	ELF-9	1.17	1.33	1.39	1.54	1.91
Boron	ELF-10	1.48	1.54	1.60	1.68	2.12
Boron	Pooled	1.17	1.51	1.86	3.23	3.77
Cadmium	ELF-1D	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	ELF-2	<0.0002	<0.0005	<0.0005	<0.0005	<0.001
Cadmium	ELF-9	<0.0002	<0.0005	<0.0005	<0.0005	0.0005
Cadmium	ELF-10	<0.0005	<0.0005	<0.0005	0.0006	0.0011
Cadmium	Pooled	<0.0002	<0.0005	<0.0005	<0.0005	0.0011
Calcium	ELF-1D	353	363	372	381	393
Calcium	ELF-2	356	385	399	418	430
Calcium	ELF-9	48.9	57	60	74	166
Calcium	ELF-10	407	457	474	500	543
Calcium	Pooled	48.9	88	393	429	543
Chloride	ELF-1D	6430	6588	6760	6960	7200
Chloride	ELF-2	187	214	397	454	473
Chloride	ELF-9	282	347	404	465	595
Chloride	ELF-10	5710	7120	7530	9900	13100
Chloride	Pooled	187	356	461	6835	13100
Chromium	ELF-1D	<0.002	<0.002	<0.002	<0.002	0.0023
Chromium	ELF-2	<0.001	<0.002	<0.002	<0.002	0.011
Chromium	ELF-9	<0.002	<0.002	<0.002	0.0056	0.0201
Chromium	ELF-10	<0.002	<0.002	0.0027	0.0056	0.0164
Chromium	Pooled	<0.001	<0.002	<0.002	0.005	0.0201
Cobalt	ELF-1D	<0.004	<0.004	<0.004	<0.004	0.0054
Cobalt	ELF-2	<0.004	<0.004	0.0048	0.006	0.0114
Cobalt	ELF-9	<0.0005	<0.004	<0.004	<0.004	0.0052
Cobalt	ELF-10	<0.004	<0.004	0.0043	0.0054	0.0079
Cobalt	Pooled	<0.0005	<0.004	<0.004	0.0051	0.0114
Fluoride	ELF-1D	<0.1	<0.1	<0.13	0.17	0.20
Fluoride	ELF-2	<0.1	<0.1	0.10	0.30	0.50
Fluoride	ELF-9	<0.1	0.49	1.19	1.50	1.84

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Fluoride	ELF-10	<0.1	<0.1	<0.1	3.87	4.36
Fluoride	Pooled	<0.1	<0.1	0.20	1.16	4.36
Lead	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	ELF-2	<0.0005	<0.002	<0.002	<0.002	0.002
Lead	ELF-9	<0.0005	<0.002	<0.002	<0.002	0.0077
Lead	ELF-10	<0.002	<0.002	<0.002	0.003	0.012
Lead	Pooled	<0.0005	<0.002	<0.002	<0.002	0.012
Lithium	ELF-1D	1.96	2.12	2.19	2.20	2.89
Lithium	ELF-2	1.34	1.51	1.75	2.82	4.93
Lithium	ELF-9	0.724	0.783	0.944	1.06	2.48
Lithium	ELF-10	0.841	1.79	2.18	2.90	4.59
Lithium	Pooled	0.724	1.08	1.61	2.20	4.93
Molybdenum	ELF-1D	0.0087	0.0153	0.0161	0.0165	0.0207
Molybdenum	ELF-2	<0.002	0.0027	0.0030	0.0033	0.0050
Molybdenum	ELF-9	0.0445	0.0679	0.1090	0.123	0.1580
Molybdenum	ELF-10	0.0142	0.0524	0.0825	0.113	0.1240
Molybdenum	Pooled	<0.002	0.0033	0.0445	0.1065	0.1580
pH	ELF-1D	7.02	7.13	7.22	7.28	7.30
pH	ELF-2	7.12	7.20	7.26	7.40	7.76
pH	ELF-9	7.51	7.86	7.94	8.04	8.19
pH	ELF-10	6.85	7.00	7.21	7.41	8.37
pH	Pooled	6.85	7.21	7.34	7.86	8.37
Radium	ELF-1D	1.09	1.23	2.20	2.63	4.40
Radium	ELF-2	0.61	0.97	1.49	2.23	8.10
Radium	ELF-9	<0.64	1.14	1.38	1.84	2.60
Radium	ELF-10	0.46	1.41	2.40	2.99	14.2
Radium	Pooled	<0.46	1.10	1.63	2.35	14.2
Selenium	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	ELF-2	0.0031	0.0207	0.198	0.457	0.608
Selenium	ELF-9	<0.002	<0.002	<0.002	<0.002	0.0095
Selenium	ELF-10	<0.002	<0.002	0.0086	0.136	0.410
Selenium	Pooled	<0.002	<0.002	0.0042	0.126	0.608
Sulfate	ELF-1D	7730	8413	8790	9380	10700
Sulfate	ELF-2	6030	7230	7925	8173	8720
Sulfate	ELF-9	5460	5905	6640	7085	8030
Sulfate	ELF-10	8610	10000	16800	19800	20700

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Sulfate	Pooled	5460	6875	7950	9085	20700
TDS	ELF-1D	25000	26350	26900	27425	28700
TDS	ELF-2	11300	11625	12000	12275	12600
TDS	ELF-9	9420	10375	10650	11250	12000
TDS	ELF-10	32900	35300	38200	39600	40300
TDS	Pooled	9420	11350	12000	30800	40300

3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON

Groundwater quality was assessed using upper tolerance limits (UTLs) and the Maximum Contaminant Levels (MCL) for each of the Appendix III and IV analytes. The data measured from the upgradient/background wells were used to compute a UTL, which serves as the background value. The larger of the UTL and MCL was used as the Groundwater Protection Standard (GWPS). Data obtained from the downgradient wells were compared point-by-point to the GWPSs to determine if the site complies with the *Final Rule*. The software package Sanitas© v.2016, was used to compute the UTLs. As part of this evaluation, groundwater data were examined for characteristics that impact how the UTL was computed. These characteristics include the:

- Number of non-detect results
- Data distribution
- Site-wide false-positive rate (SWFPR)
- Spatial and seasonal variability.

Summary statistics and other statistical characteristics of the data are discussed in the previous section. These characteristics were used to compute the appropriate UTL for each analyte.

3.1 Groundwater Protection Standards

The shape or distribution of the data was assessed to ensure that the most appropriate UTL was used for comparison purposes. The most efficient UTL is a parametric UTL that assumes the data follow a normal distribution. If the data do not follow a normal distribution, a non-parametric UTL is typically used. Thus, the data for each analyte are assessed to determine if a parametric UTL can be computed from the data. The parametric UTL is computed using the formula below:

$$UTL = \bar{X} + \kappa \times S$$

Where:

$\bar{X}$ = the average of the background data
κ = multiplier from EPA Unified Guidance, March 2009
S = standard deviation of the background data

3.1.1 Normal Distribution

Histograms and dot plots were used to visually inspect the data for deviations from normality and to determine if outliers are present. This examination reveals the outliers are present in the data. The Shapiro-Wilk test was used to assess normality in conjunction with the normal quantile plots. If the p-value associated with the test was greater than or equal to 0.05, the data are considered normally distributed and a parametric UTL was computed using the upgradient measurements. If the p-value is less than 0.05, then the maximum detected value was used as the UTL.

Note: The 0.05 p-value is not a hard and fast rule. Parametric UTLs were computed for analytes whose p-values were sufficiently close to 0.05 as determined by the Sanitas software (Sanitas 2016).

If the data for an analyte were not normally distributed, the ladder of powers method was used to determine if a reasonable transformation existed that would produce normal data. The ladder of powers tests different monotonic transformations of the data, such as the natural logarithm or square, to see if the transformed data have a normal distribution. If a transformation within the ladder of powers can be found that produces normal data, a parametric UTL was computed using the transformed data. If a transformation was identified, it was applied to both upgradient / background and downgradient groundwater data prior to comparison. A non-parametric UTL was computed for data that are not normally distributed and cannot be transformed. The non-parametric UTL is the largest value measured in the upgradient / background wells. Table C.4 summarizes the results of the Shapiro-Wilk test for each of the Appendix III and IV analytes where at least 50% of the measurements were detects. An appropriate transformation was found for lithium and radium. Non-parametric UTLs were computed for all of the analytes except for lithium, pH, and radium.

Table C.4. Shapiro-Wilk Test for the CCR Landfill upgradient wells.

Analyte	W-Statistic	P-Value	Normal
Barium	0.7158	<0.0001	No
Boron	0.8288	<0.0001	No
Calcium	0.7947	<0.0001	No
Chloride	0.6997	<0.0001	No
Fluoride	0.6306	<0.0001	No
Lithium	0.8815	<0.0001	No
Square Root of Lithium	0.9379	0.0069	Yes
Molybdenum	0.8501	<0.0001	No
pH	0.9272	0.0039	Yes
Radium	0.5521	<0.0001	No
LN of Radium	0.9566	0.0455	Yes
Selenium	0.6306	<0.0001	No
Sulfate	0.7042	<0.0001	No
TDS	0.7052	<0.0001	No

3.1.2 Upper Tolerance Limits and Groundwater Protection Standard

This section contains the GWPS computed for each analyte. Table C.5 lists the UTL, MCL, and GWPS for each of the analytes in the upgradient wells. The following criteria were used for determining each GWPS:

- If more than 50% of the data were detected and have a normal distribution, a parametric UTL was computed.
- If the data were not normally distributed or more than 50% of the data were non-detects, the greater of the largest MDL and maximum detected value was used as the UTL.
- If all of the upgradient samples were non-detects, the largest MDL was used as the UTL.
- The larger of the MCL and the UTL was used as the GWPS.
- Fluoride is compared to both the MCL and the UTL if the MCL exceeds the UTL, to meet the criteria for Appendix III constituents.

Figure C.4 shows graphs that were constructed for each of the analytes that had at least one detectable measurement in the downgradient wells. The graphs illustrate the GWPS as a horizontal line with the measurements from each of the downgradient wells plotted on the same graph. Non-detects are represented by hollow gray circles on the graphs. These graphs clearly depict how the downgradient measurements compare to the GWPS.

Results above the upper line represent values exceeding the site-specific background for Appendix III constituents and the groundwater protection standard for Appendix IV constituents. As the graphs illustrate boron exceeded site-specific background and arsenic, cobalt, lithium, and molybdenum exceeded their groundwater protection standards. Table C.5 list the comparisons for each analyte (Figure C.4). Plots are not provided for analytes that were not detected in any downgradient samples.

Table C.5. Comparison of downgradient well results to background and groundwater protection standards

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	Within Limit
Arsenic	0.0117	0.01	0.0117	ELF-5R, ELF-14
Barium	0.102	2.0	2.0	Within Limit
Beryllium	0.002	0.004	0.004	Within Limit
Boron	3.77	NA	3.77	ELF-4, ELF-5R, ELF-8, ELF-11
Cadmium	0.0011	0.0050	0.0050	Within Limit

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Calcium	543	NA	543	Within Limit
Chloride	13100	NA	13100	Within Limit
Chromium	0.020	0.1000	0.1000	Within Limit
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	Within Limit
Fluoride App 3	4.36	NA	4.36	Within Limit
Lead	0.012	0.015	0.015	Within Limit
Lithium	4.28	0.04	4.28	ELF-14
Mercury	0.0002	0.002	0.002	Within Limit
Molybdenum	0.158	0.100	0.158	ELF-8
pH Acidic Range	6.51	NA	6.51	Within Limit
pH Basic Range	8.46	NA	8.46	Within Limit
Radium	6.2	5.0	6.2	Within Limit
Selenium	0.608	0.050	0.608	Within Limit
Sulfate	20700	NA	20700	Within Limit
TDS	40300	NA	40300	Within Limit
Thallium	0.002	0.002	0.002	Within Limit

4.0 CONCLUSIONS

Groundwater data was collected from the CCR Landfill monitoring network at the Hunter Power Plant. A comprehensive data analysis was completed on the upgradient wells to ensure that comparisons between upgradient and downgradient wells were done correctly. During the Spring 2022 sampling event, statistically significant increases (SSIs) above background were noted for Appendix III constituent boron.

SSIs above groundwater protection standards were noted for Appendix IV constituents:

- Arsenic,
- Cobalt,
- Lithium, and
- Molybdenum.

5.0 REFERENCES

EPA, 2009, "Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities Unified Guidance," EPA 530/R-09-007, U.S. Environmental Protection Agency, March 2009.

Helsel, Dennis, 2004, *Nondetects and Data Analysis: Statistic for Censored Environmental Data*, New York: Wiley Interscience.

R Core Team, 2022, *R: A Language and Environment for Statistical Computing*, https://www.R-project.org, R Foundation for Statistical Computing, Vienna, Austria.

Sanitas Technologies, 2016, Sanitas, www.sanitastech.com, Shawnee, Kansas.

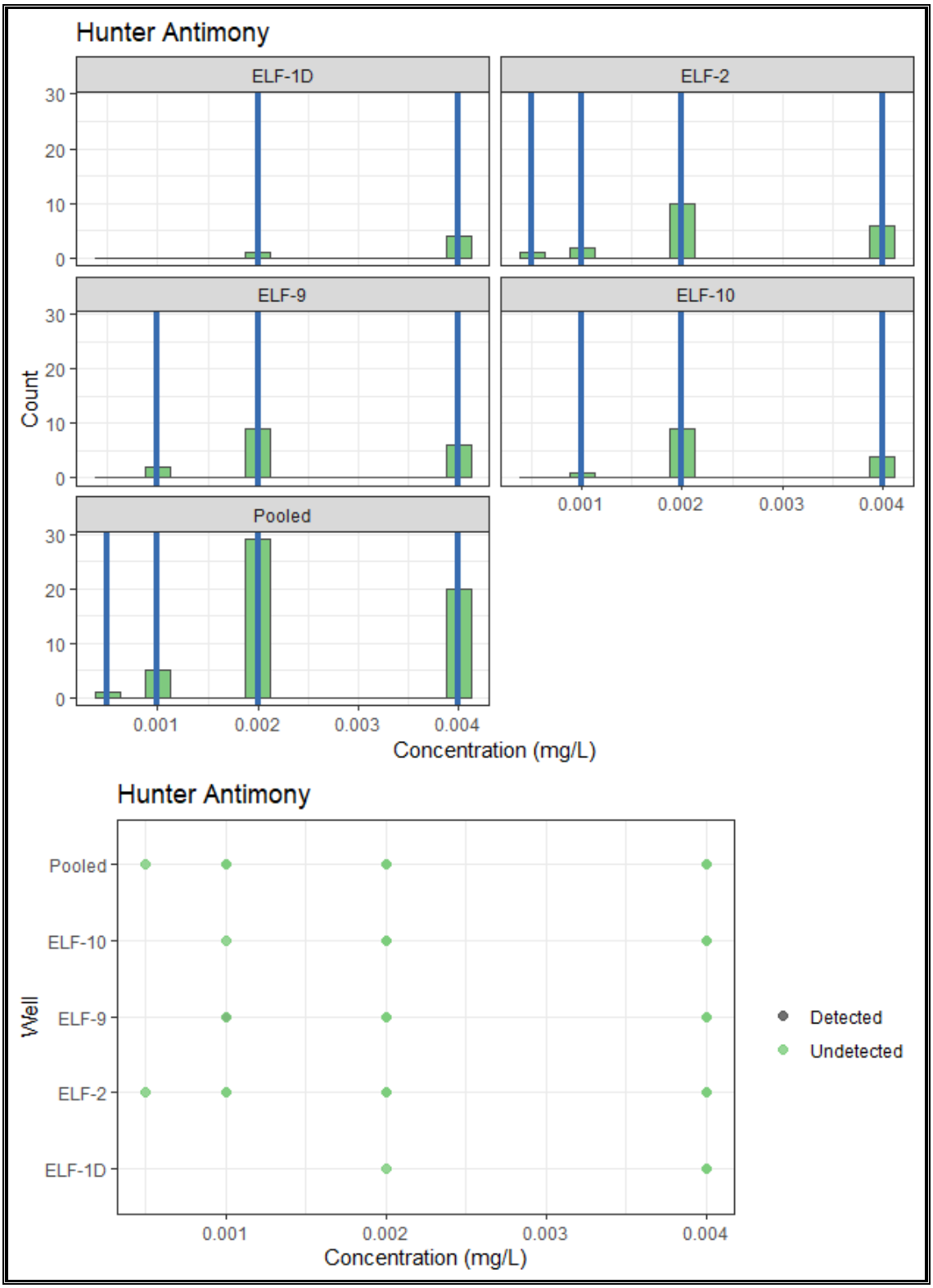


Figure C.3. Histograms and dot plots for the upgradient Ash Landfill data.

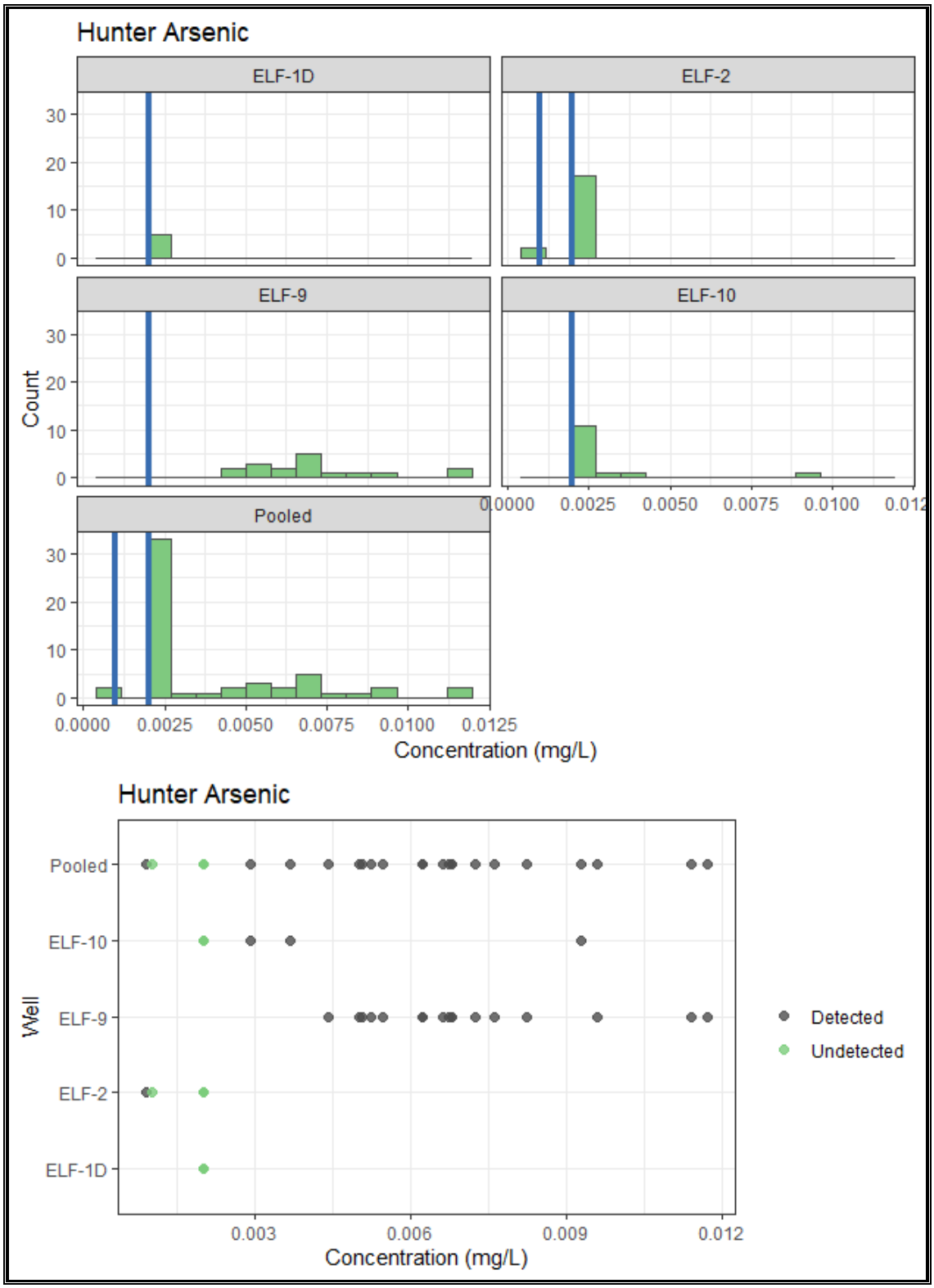


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

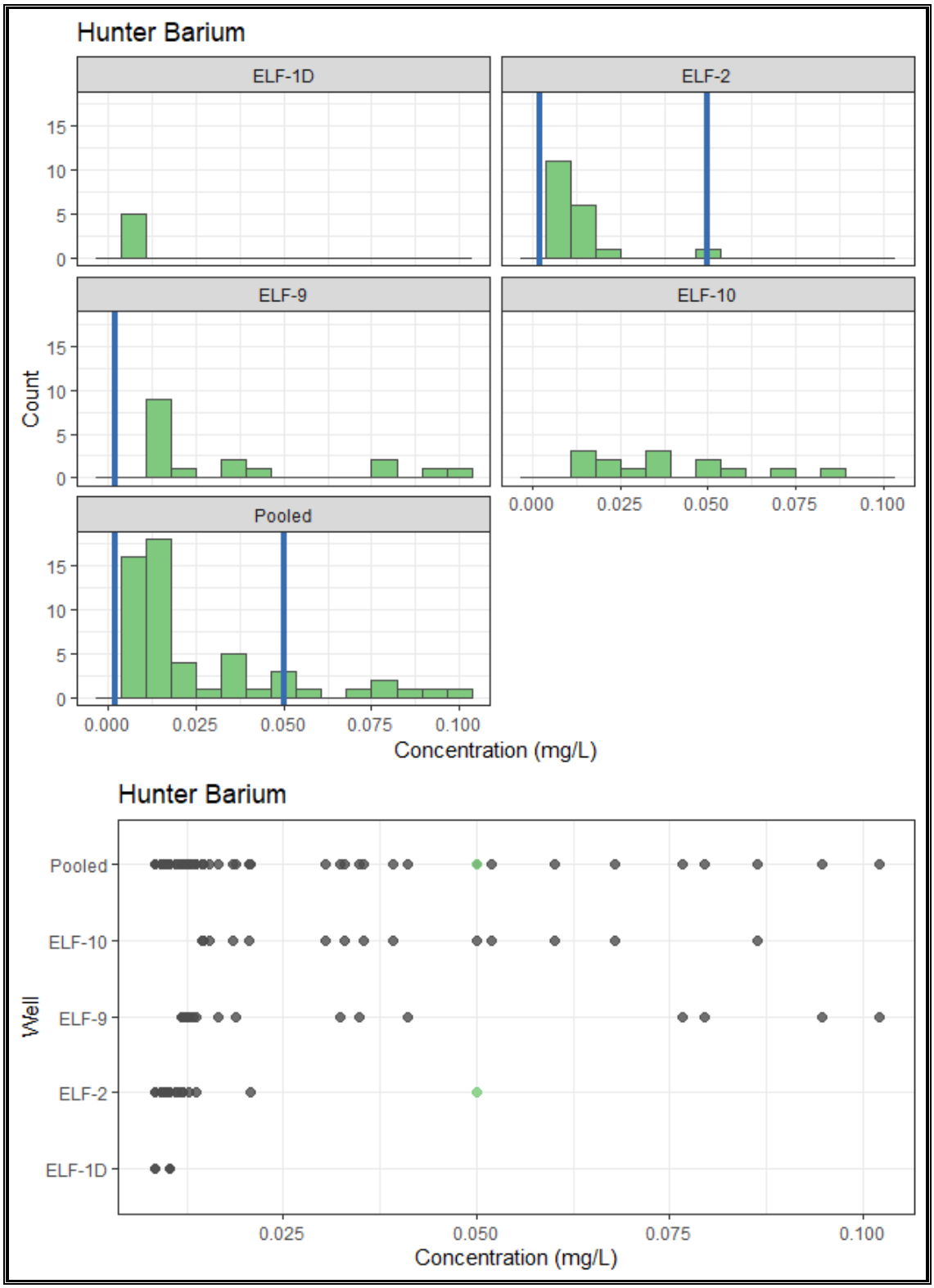
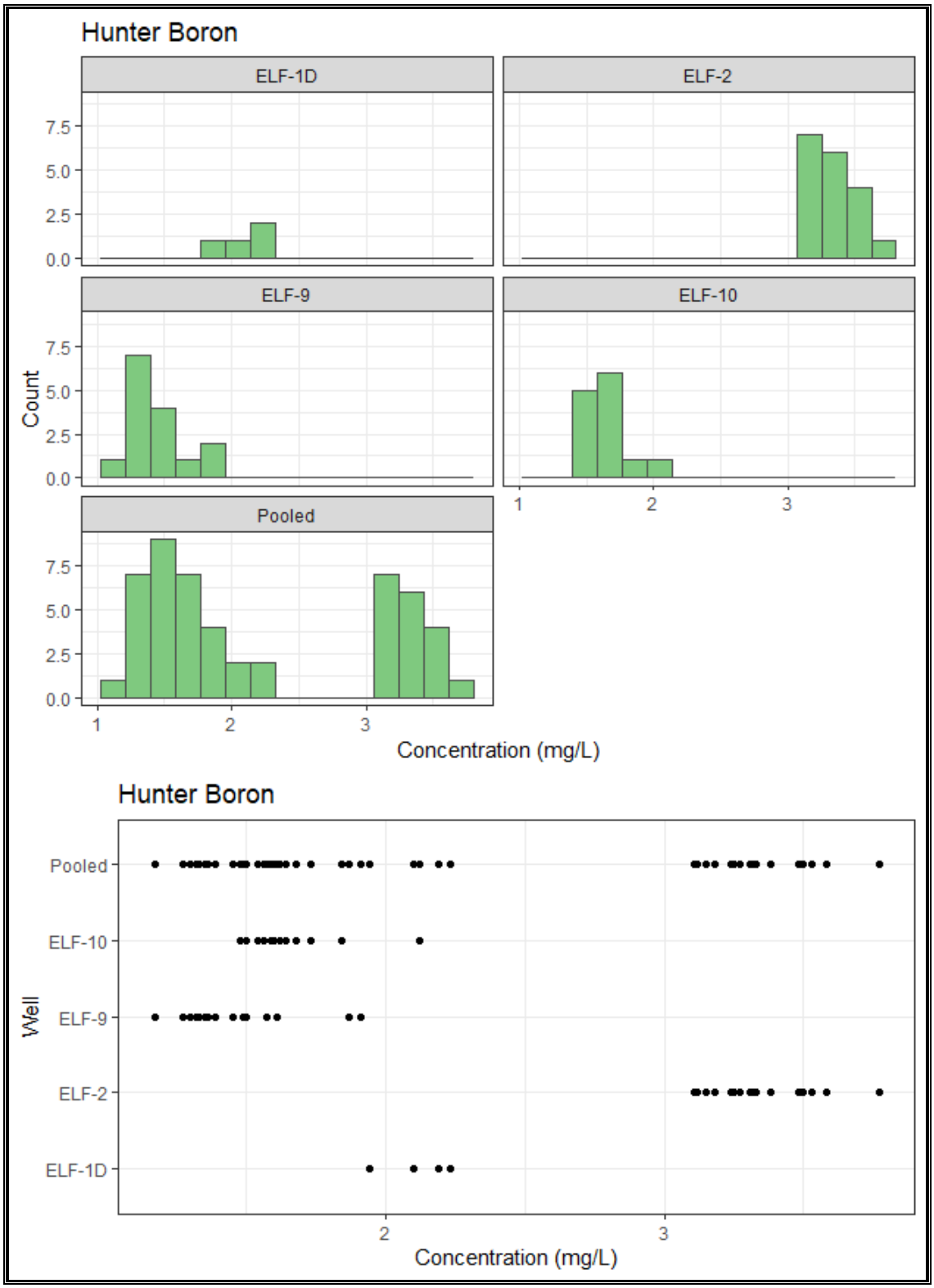


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.



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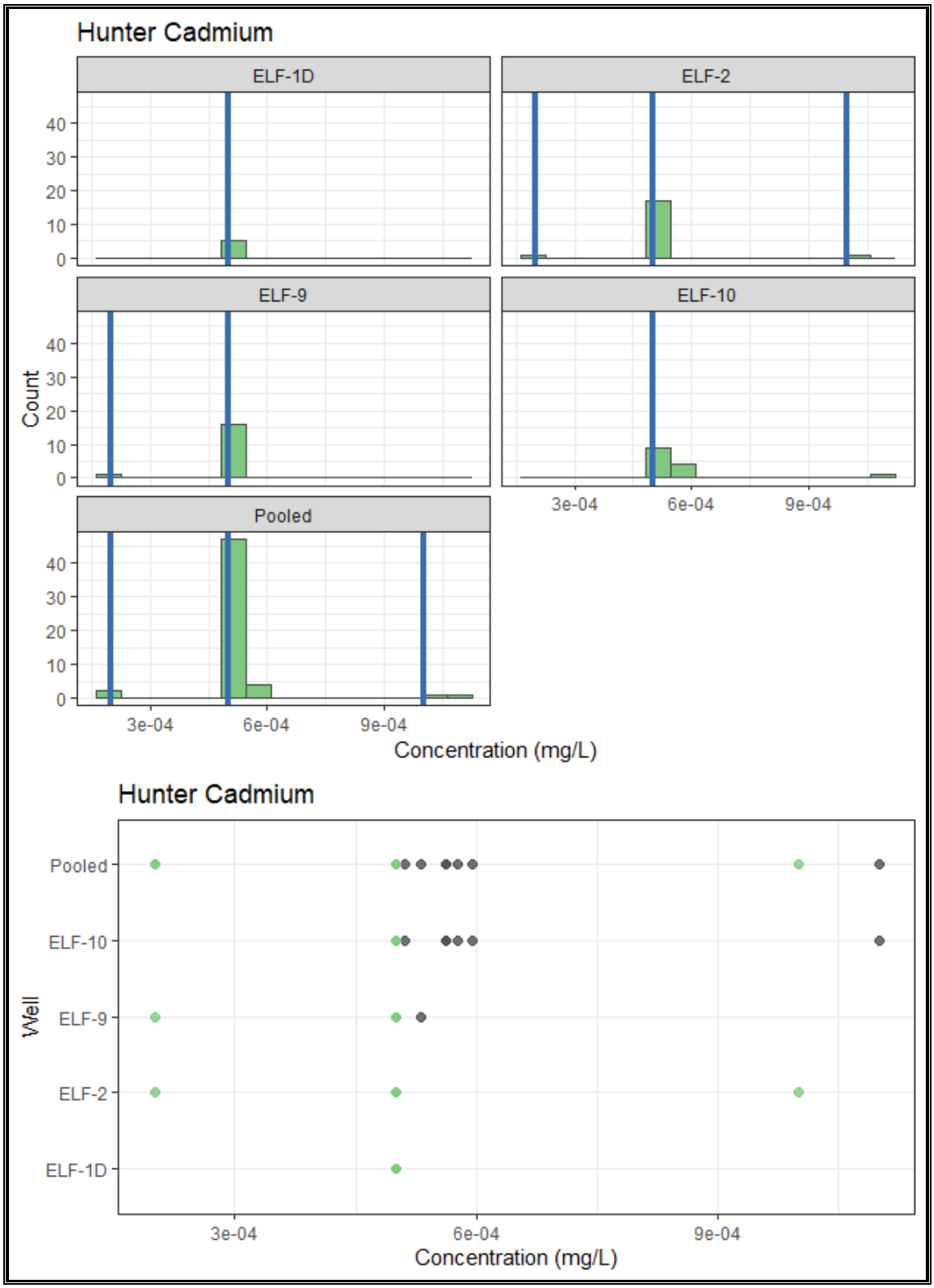

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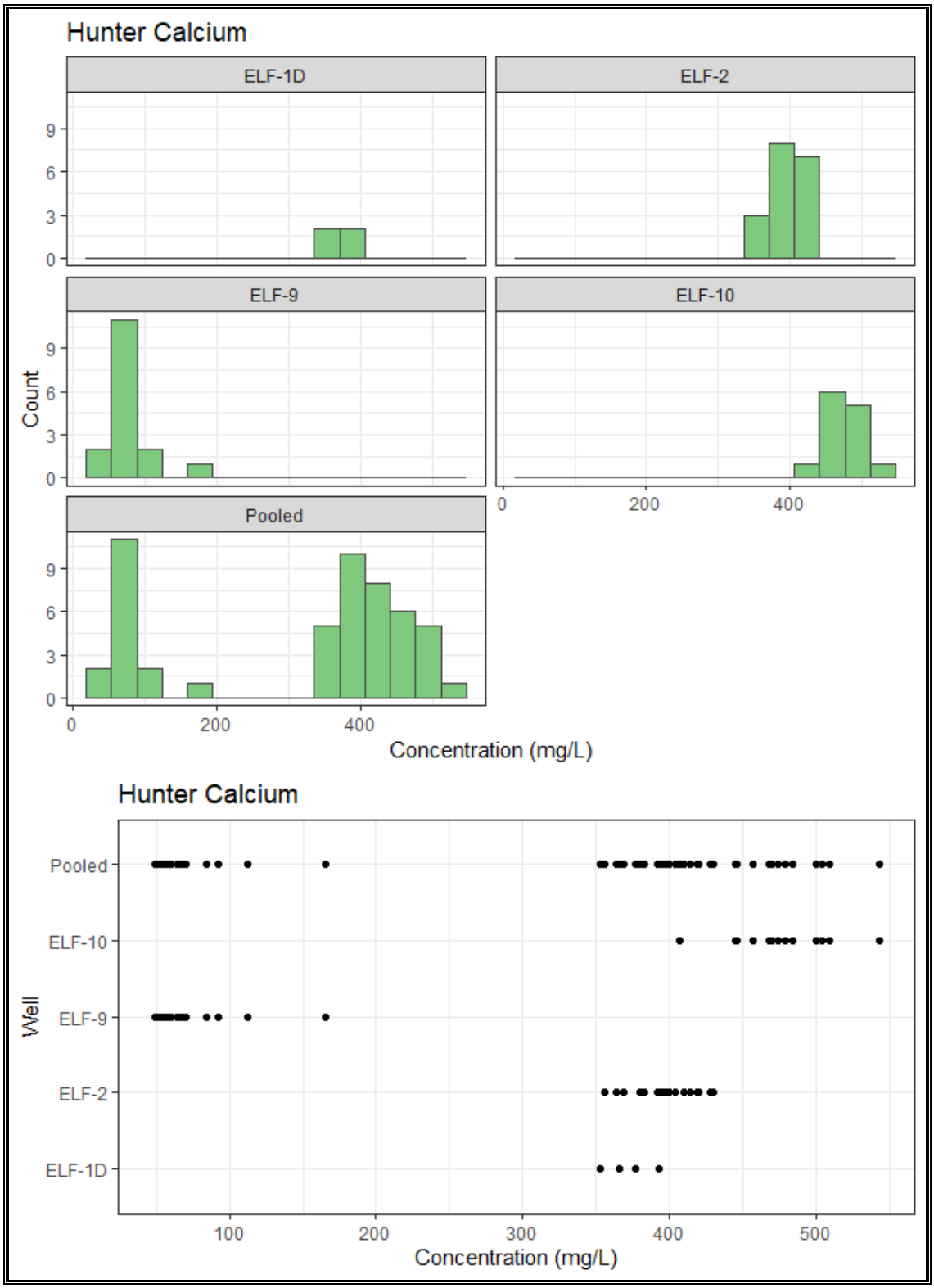

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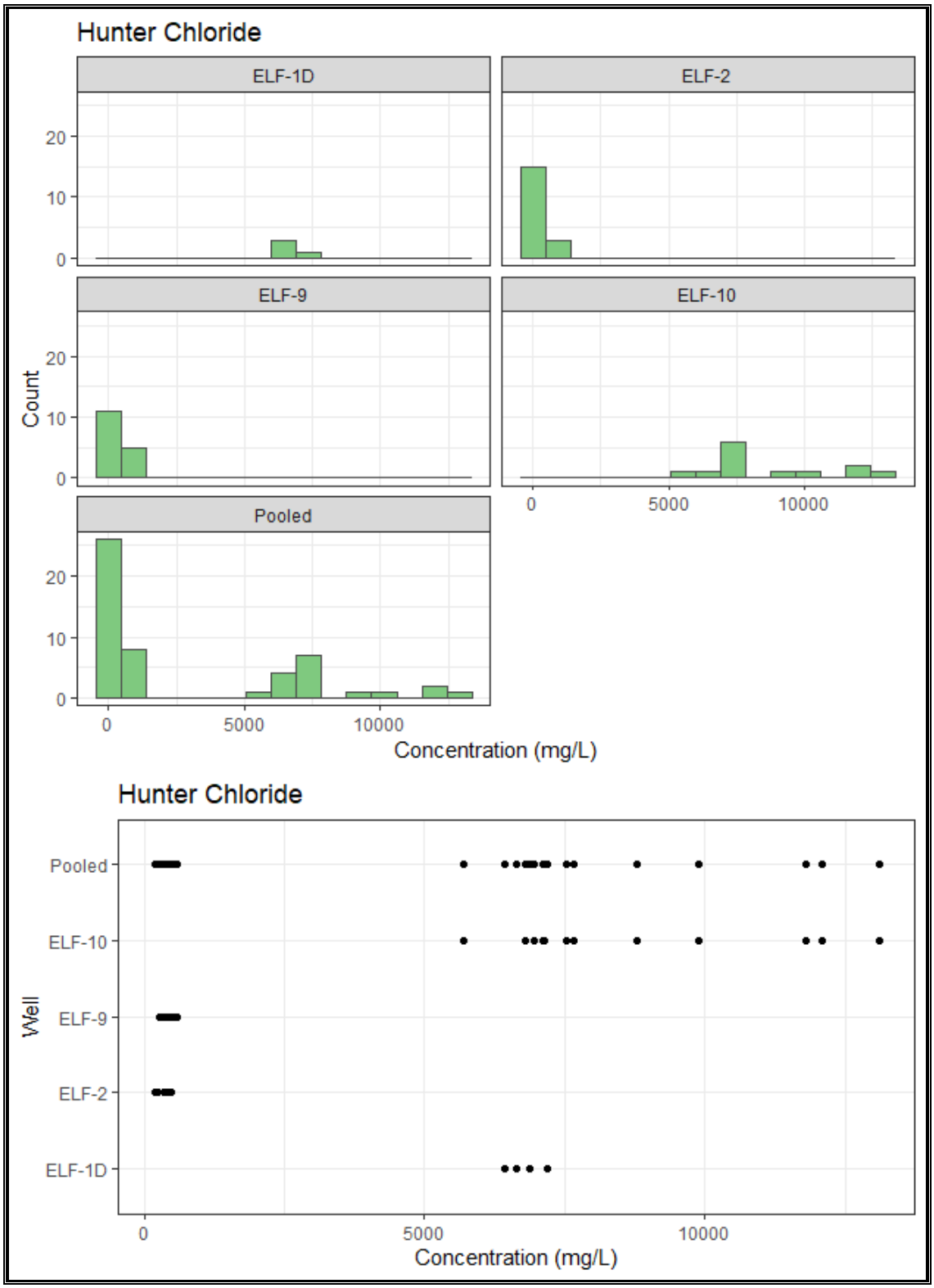

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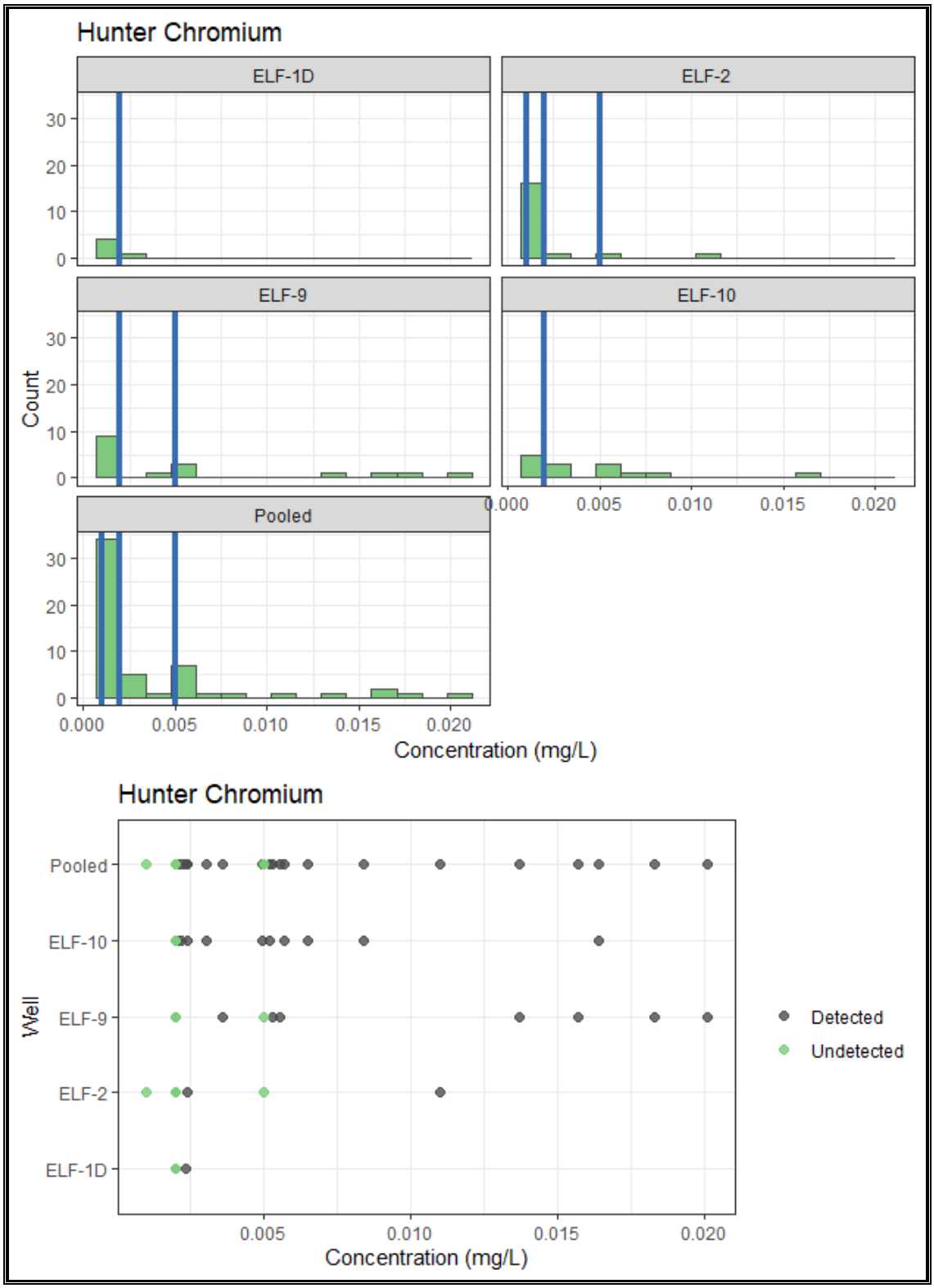

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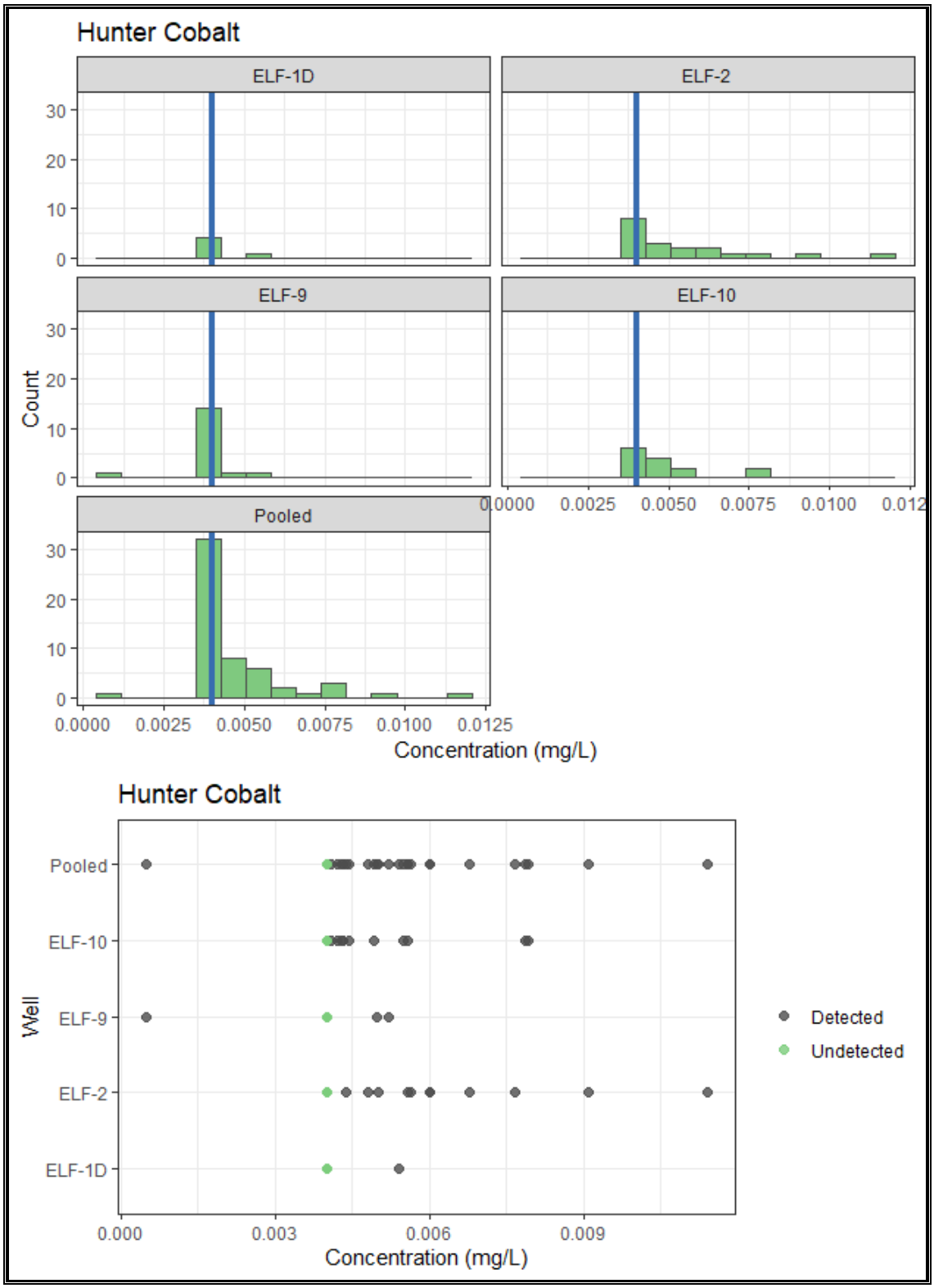

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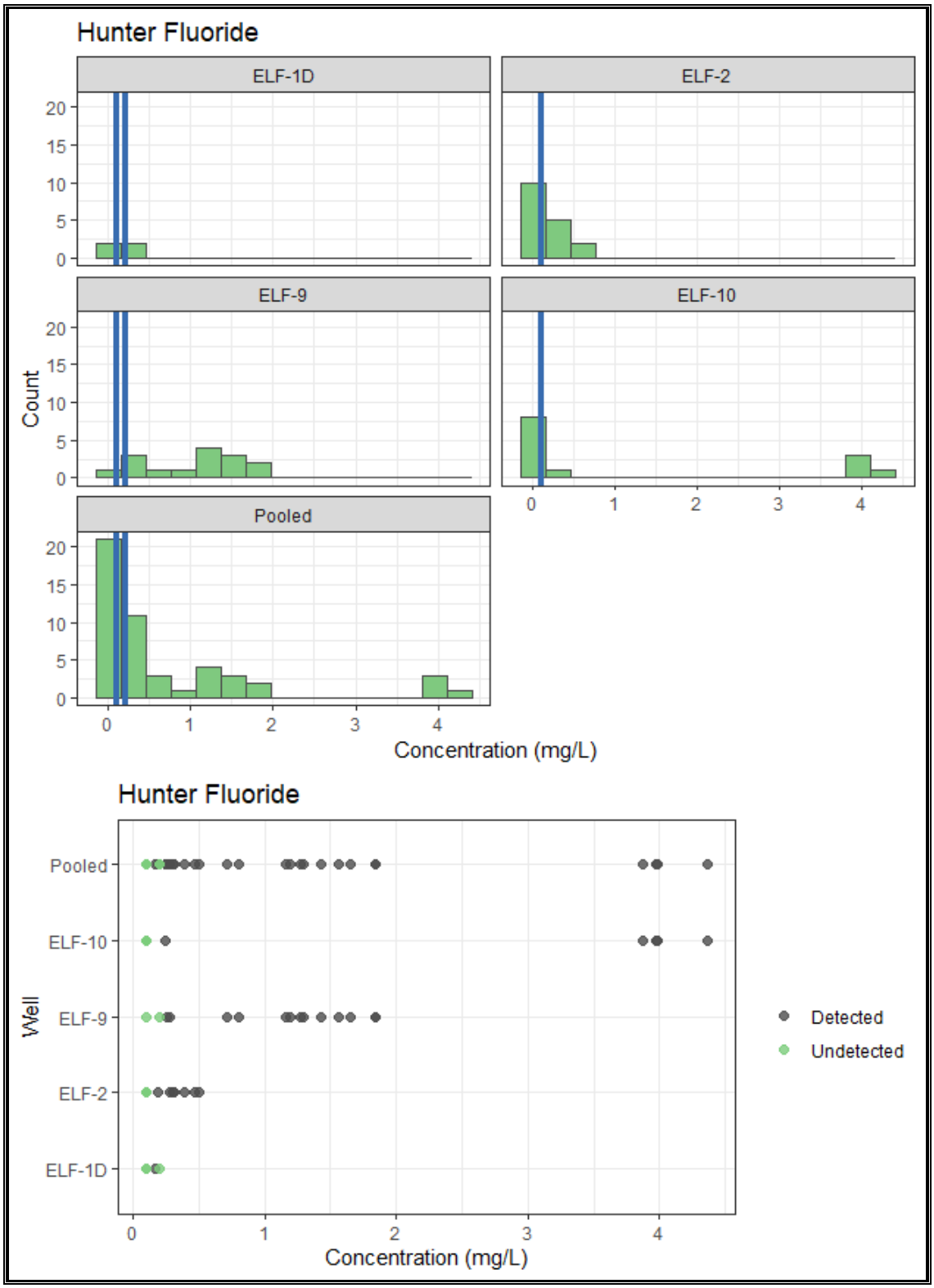

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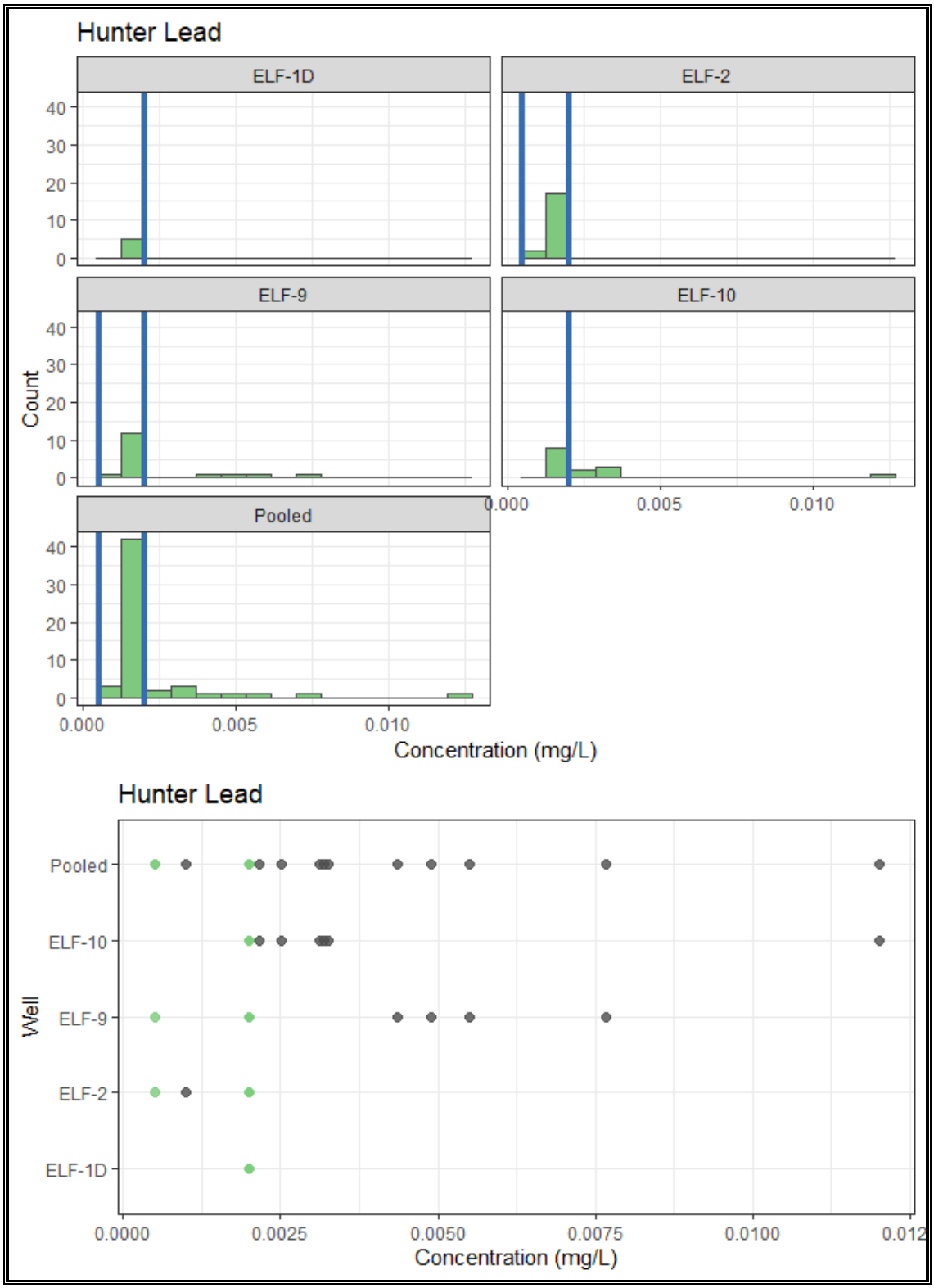

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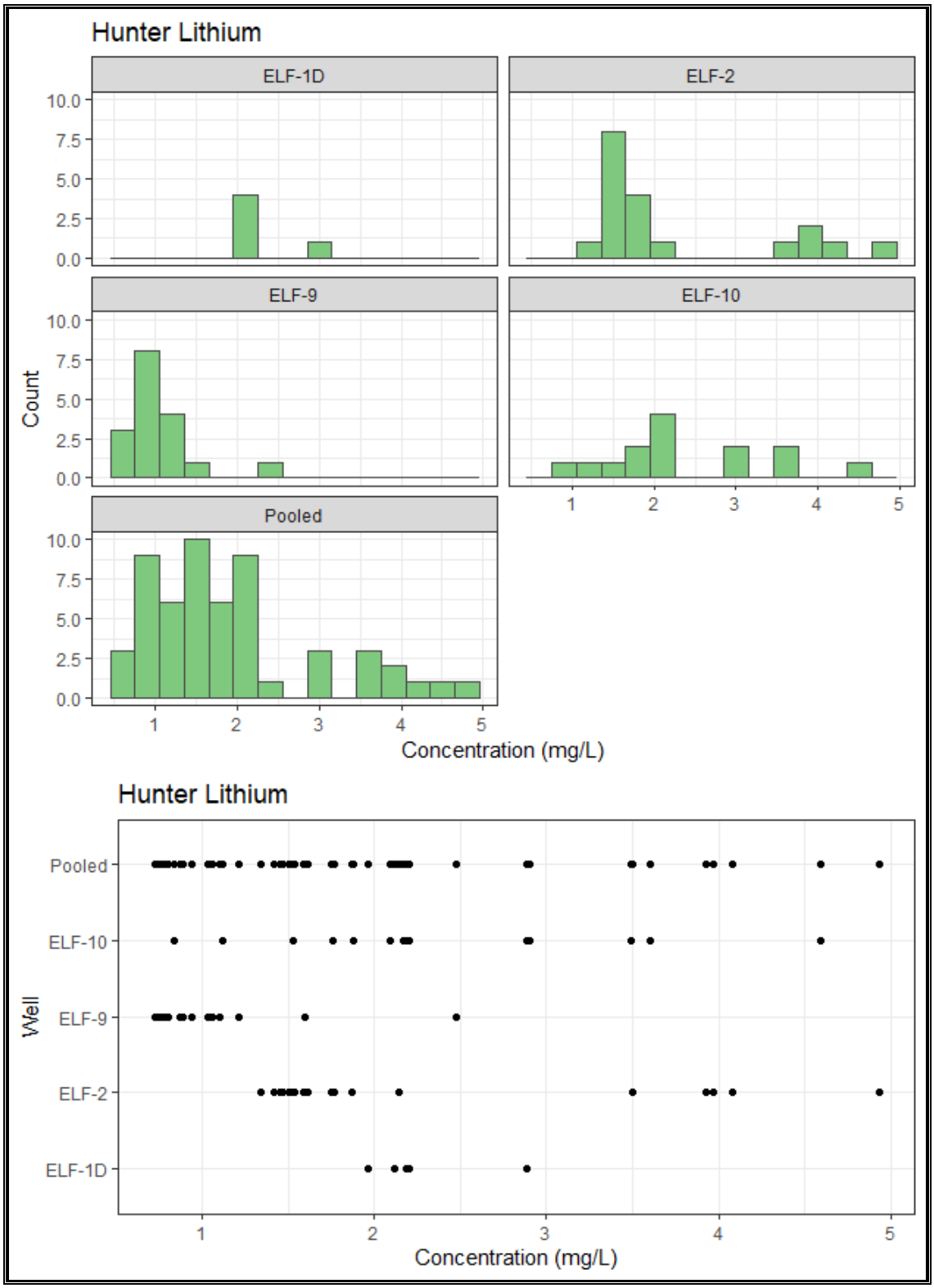

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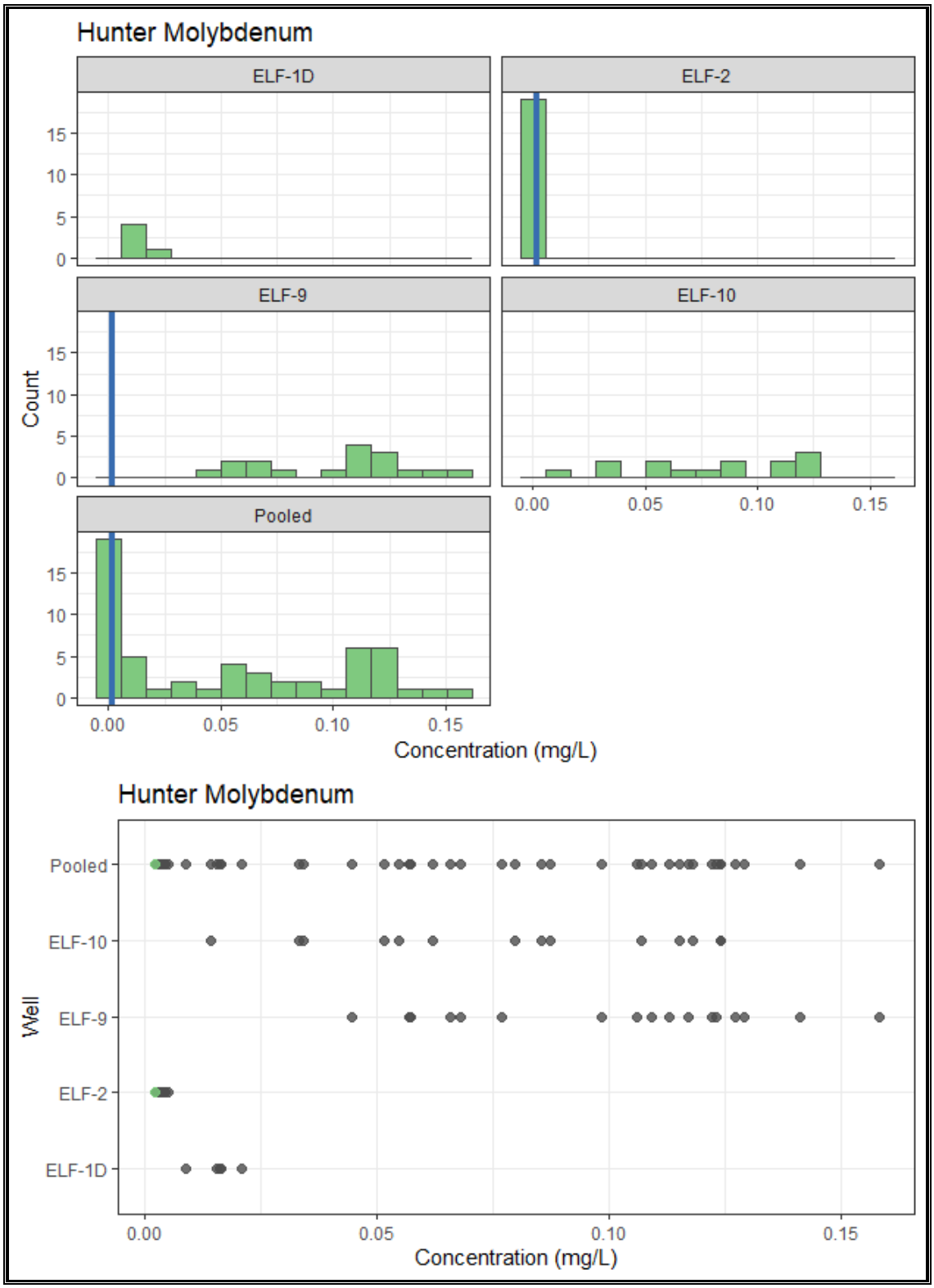

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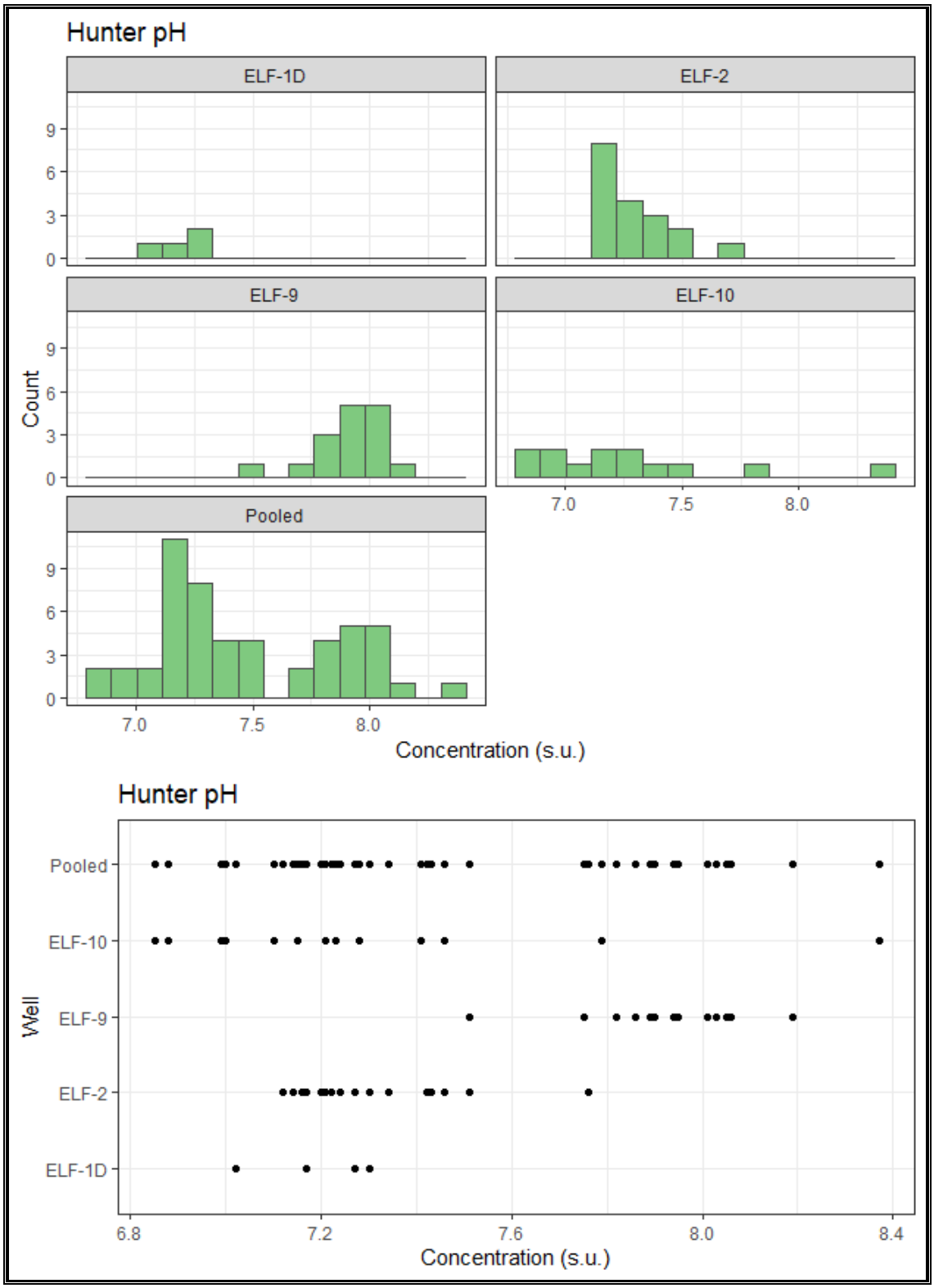

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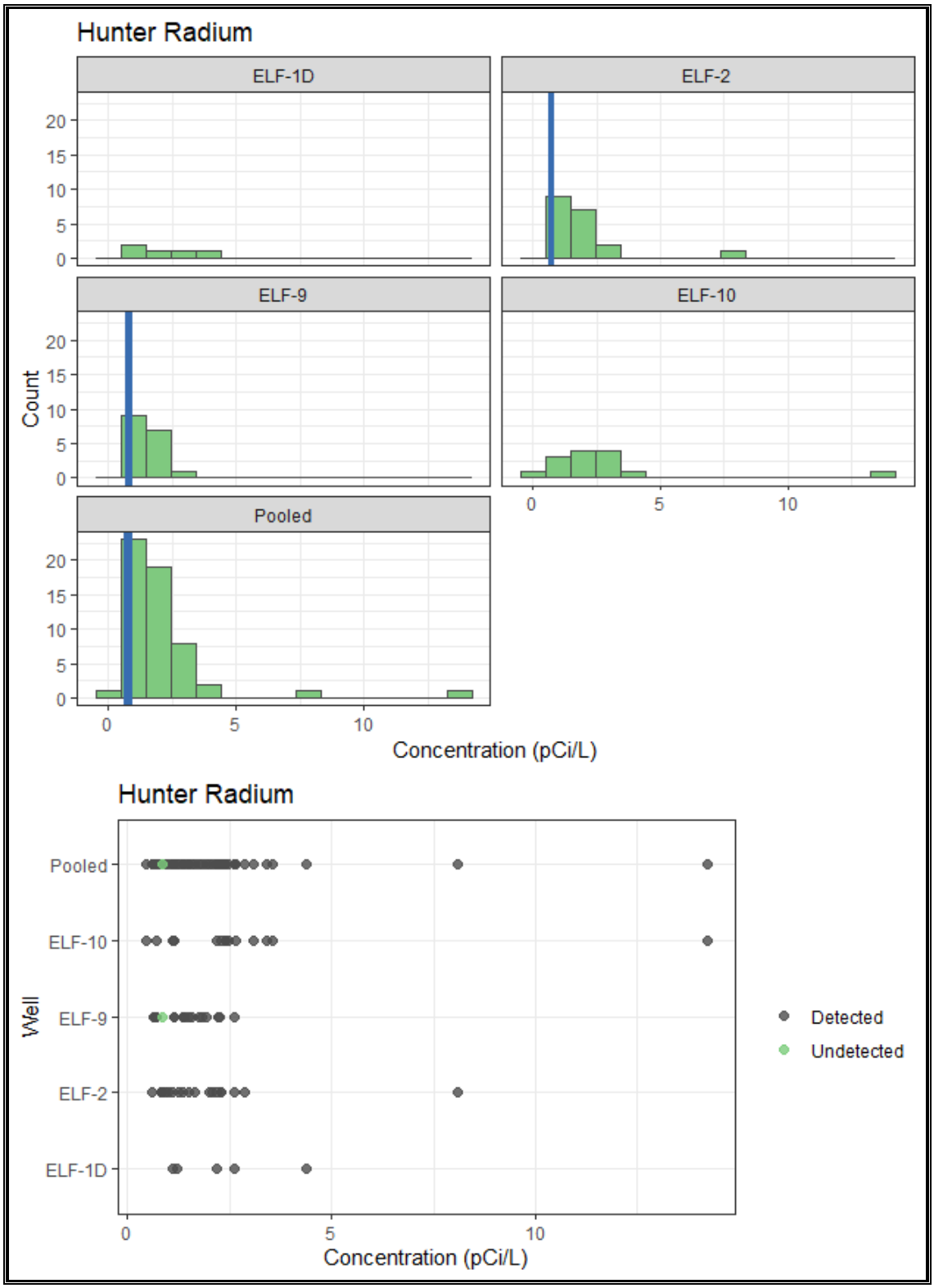

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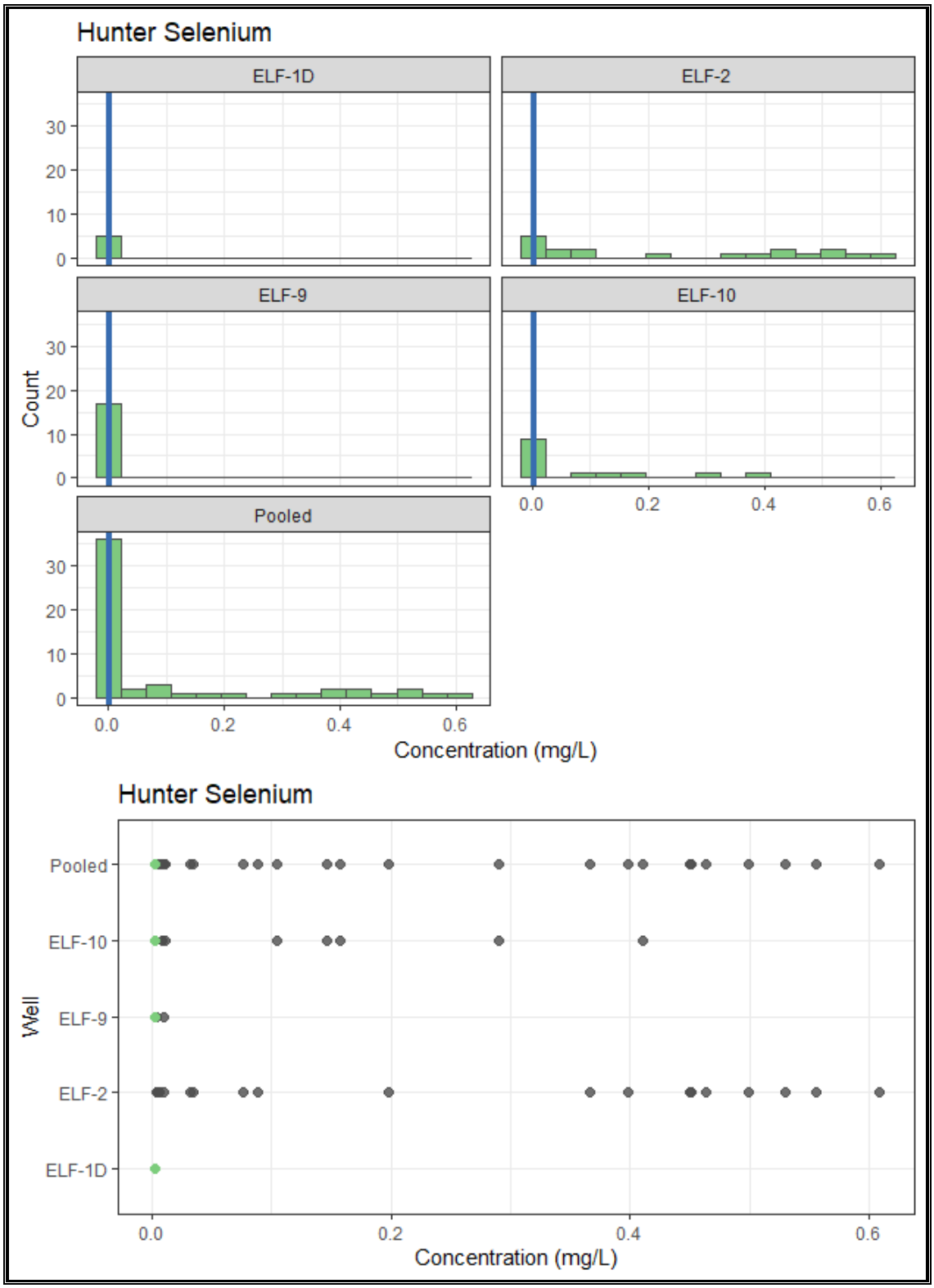

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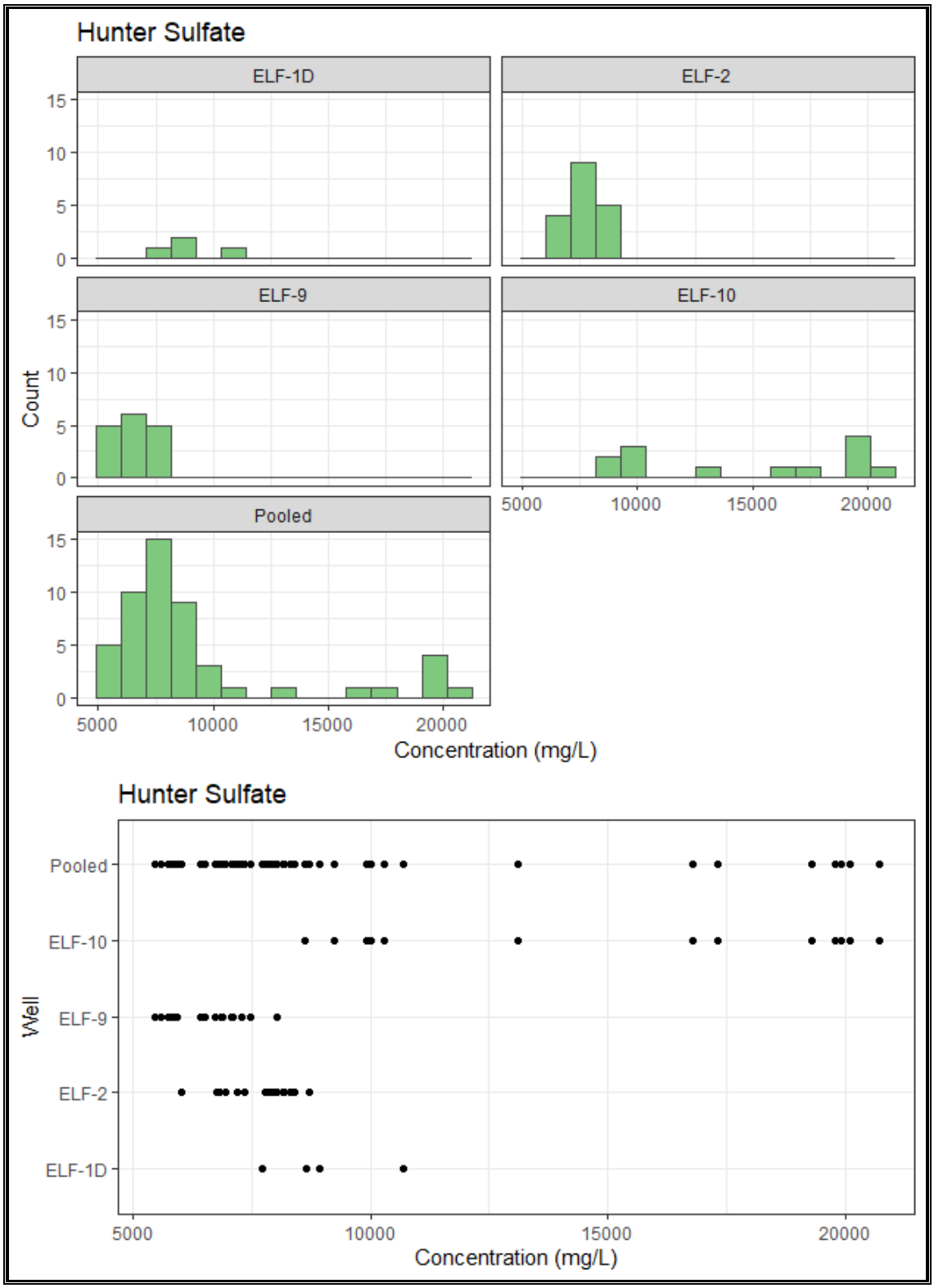

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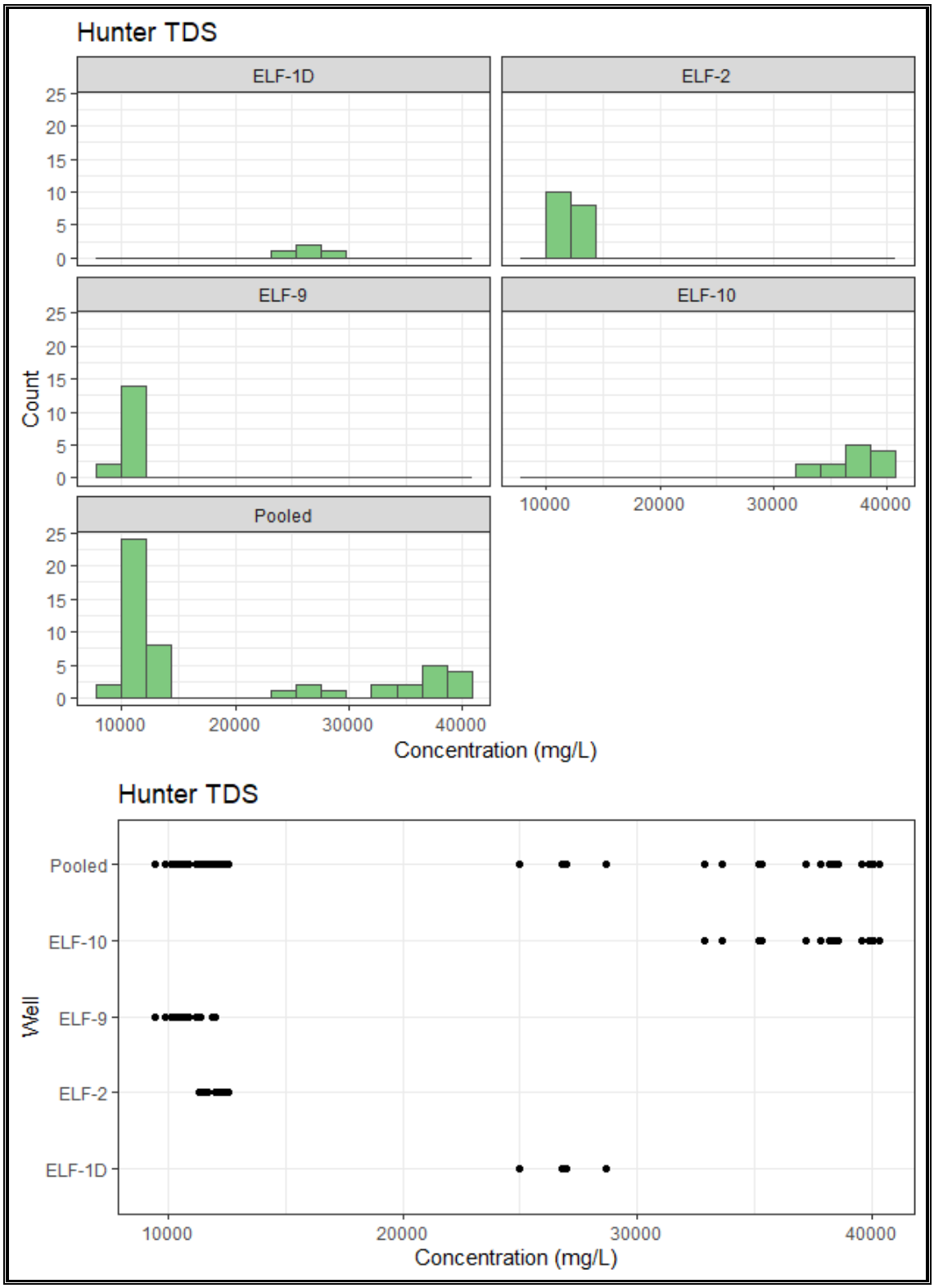

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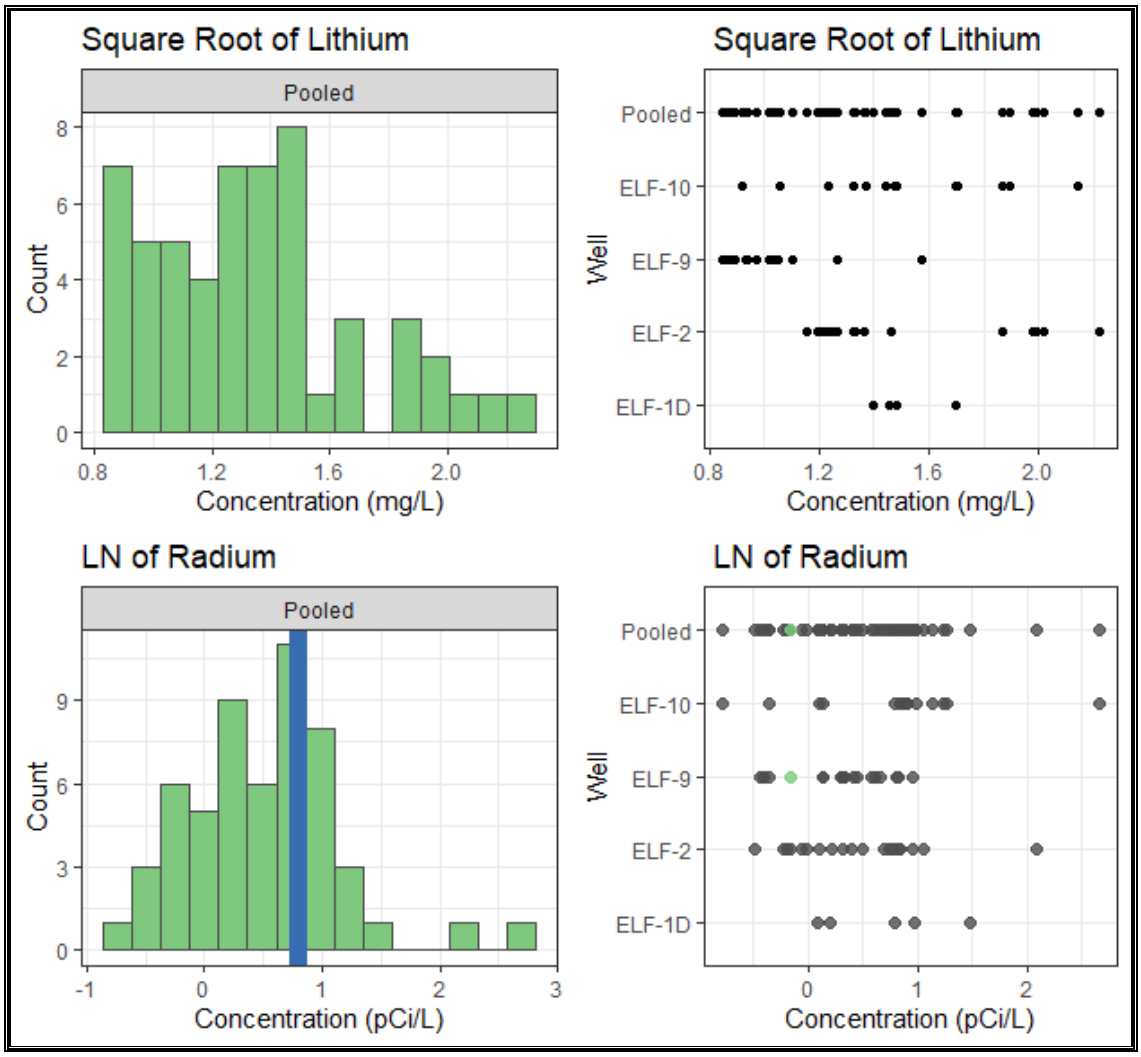

Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

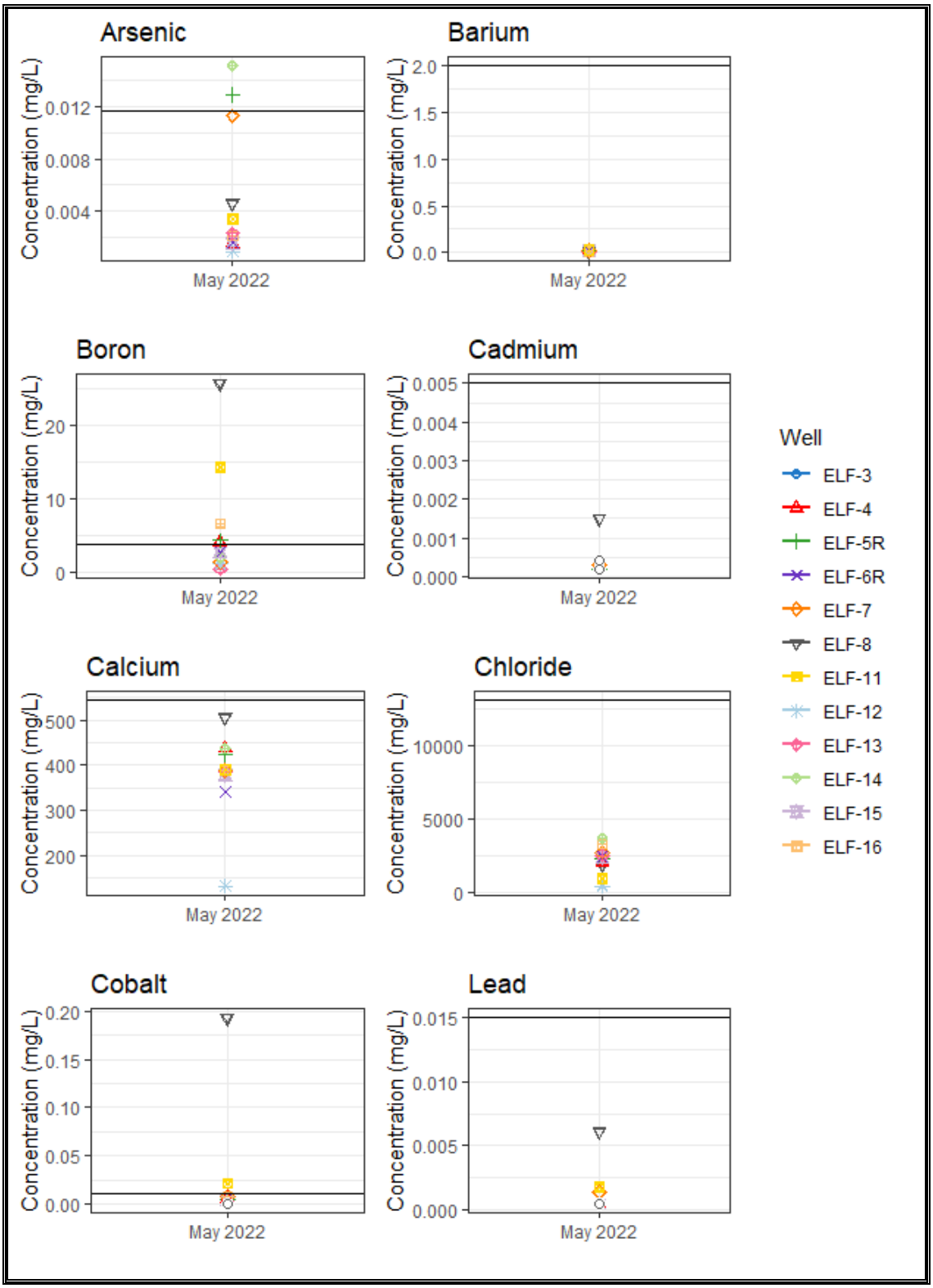

Figure C.4. Background upper tolerance limit plots for the CCR Landfill.

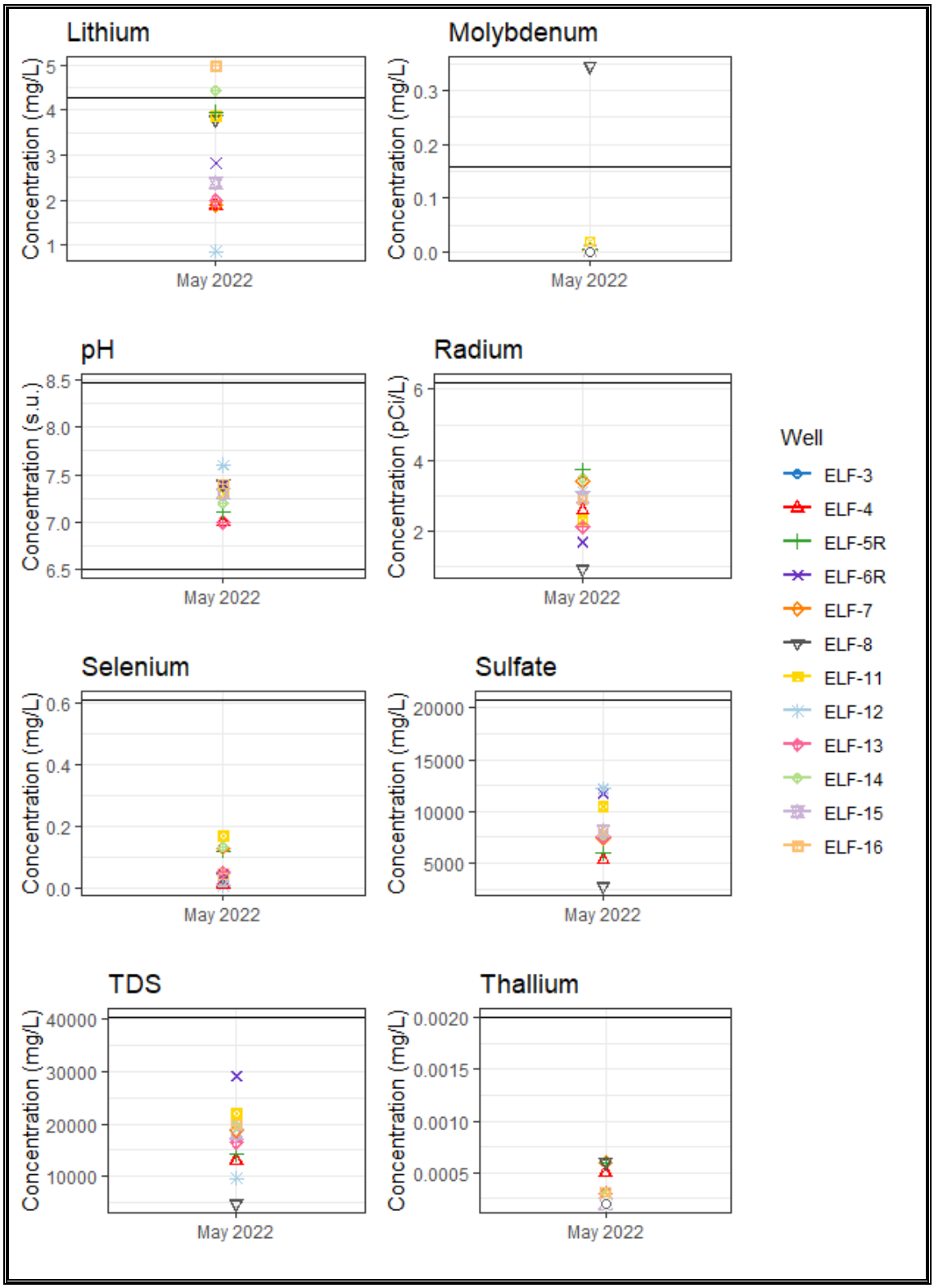

Figure C.4 (cont.). Background upper tolerance limit plots for the CCR Landfill.

Attachment D:

Field Data Sheets

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-1d
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV	**Depth to Water (ft.)**	83.49
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No Sample

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-2
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	13:30
Sampler(s) Initials	DV	**Depth to Water (ft.)**	23.91
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,310	14.3	13,700	1.25	7.15	7.9	0
1,315	14.3	13,700	0.96	7.13	7.8	0
1,320	14.3	13,700	0.98	7.14	7.8	0
1,325	14.3	13,700	0.93	7.14	7.8	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Clear water, slow production - ran out of water while sampling. Waited 1hr - not much recharge

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-3
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV	**Depth to Water (ft.)**	33.32
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

After a few min pumping, dtw was below top of pump. And a few min later well dry. No Sample

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-4
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	11:30
Sampler(s) Initials	DV	**Depth to Water (ft.)**	18.35
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,105	12.7	15,000	1.39	7.13	8.7	14.4
1,110	12.7	15,100	1.11	7.10	8.7	7.1
1,115	12.6	15,100	0.97	7.07	8.7	6.2
1,120	12.6	15,100	0.99	7.06	8.7	4.9
1,125	12.6	15,100	1.01	7.05	8.7	5.2

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Clear water, good production, dedicated low flow pump

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-5R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	17:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	20.94
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,725	13.0	21,700	0.83	7.15	12.9	834
1,730	13.0	21,700	0.80	7.13	12.9	389
1,735	13.0	21,700	0.82	7.12	12.9	246
1,740	13.0	21,700	0.80	7.13	12.9	197
1,745	13.0	21,700	0.78	7.13	12.9	190

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

DUP taken at this well. ORP is salinity, no ORP reading was taken. Newly drilled replacement well. Muddy. Low flow 12V pump

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-6R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	17:10
Sampler(s) Initials	DV	**Depth to Water (ft.)**	20.21
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,640	13.1	31,600	1.26	7.49	19.4	309
1,645	13.0	31,300	1.20	7.48	19.1	192
1,650	13.1	30,700	1.22	7.46	18.6	180
1,655	13.0	29,800	1.19	7.44	18.1	32.2
1,700	13.0	29,500	1.18	7.42	17.8	19.9
1,705	13.0	29,300	1.16	7.41	17.8	18.3

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Newly drilled well. Replacement well. muddy, cleared after a lot of pumping, low flow 12V pump. No dedicated pump yet

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-7
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	20:00
Sampler(s) Initials	DV	**Depth to Water (ft.)**	16.62
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,935	11.6	20,400	1.43	7.02	12	96
1,940	11.6	20,400	1.36	6.97	12	81.2
1,945	11.5	20,400	1.25	6.98	12	78.9
1,950	11.5	20,400	1.18	6.96	12	64.3
1,955	11.5	20,400	1.11	6.96	12	62.7

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Dedicated low flow pump. Muddy

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-8
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	10:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	9.1
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,025	11.9	11,300	1.23	7.42	6.3	17.2
1,030	11.8	11,200	0.92	7.44	6.3	8.1
1,035	11.8	11,200	0.81	7.48	6.3	3
1,040	11.8	11,200	0.79	7.49	6.3	2.9
1,045	11.8	11,200	0.78	7.49	6.3	2.7

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Dedicated pump - low flow. Clear water, excellent recharge

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-8
Sampling Method	Low Flow Bladder Pump	**Sample Date**	May 4, 2022
Decon Method	Dedicated Equipment	**Sample Time**	16:20
Sampler(s) Initials	DV	**Depth to Water (ft.)**	9.06
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,600	12.8	11,200	1.36	7.21	6.3	5.3
1,605	12.8	11,200	0.99	7.33	6.3	0
1,610	12.8	11,200	0.97	7.38	6.3	0
1,615	12.8	11,200	0.95	7.39	6.3	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Sample for radium only. Re-collecting samples lost in transit from Chemtech Ford to radium lab during analysis of May 2022 samples.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-9
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	12:35
Sampler(s) Initials	DV	**Depth to Water (ft.)**	23.04
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,210	13.1	14,900	1.22	7.86	8.5	3.9
1,215	13.0	14,700	0.97	7.87	8.4	1.1
1,220	13.2	14,400	0.89	7.90	8.2	0
1,225	13.2	14,300	0.81	7.91	8.2	0
1,230	13.3	14,200	0.72	7.89	8.2	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

BLANK TAKEN HERE. ORP is salinity, no ORP reading was taken.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-9
Sampling Method	Low Flow Bladder Pump	**Sample Date**	May 5, 2022
Decon Method	Dedicated Equipment	**Sample Time**	11:00
Sampler(s) Initials	DV	**Depth to Water (ft.)**	22.94
Field Conditions	na		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,040	12.9	14,800	1.02	7.25	8.4	5.1
1,045	12.7	14,100	0.72	7.34	8.1	0.2
1,050	12.8	13,900	0.70	7.33	8	0
1,055	12.8	13,900	0.70	7.32	7.9	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Sample for radium only. Re-collecting samples lost in transit from Chemtech Ford to radium lab during analysis of May 2022 samples.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-10
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV	**Depth to Water (ft.)**	50.41
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Not enough water to sample

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-11
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 7, 2022
Decon Method	Dedicated Equipment	**Sample Time**	10:05
Sampler(s) Initials	DV	**Depth to Water (ft.)**	28.09
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
940	13.1	20,800	2.07	7.04	12.3	417
945	13.1	20,800	1.90	7.07	12.3	311
950	13.3	20,800	1.66	7.10	12.3	283
955	13.3	20,900	1.59	7.08	12.4	278
1,000	13.2	21,000	1.55	7.07	12.5	270

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Slow production, muddy yellow

Water & Environmental TECHNOLOGIES

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Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-11
Sampling Method	Low Flow Bladder Pump	**Sample Date**	May 4, 2022
Decon Method	Dedicated Equipment	**Sample Time**	17:05
Sampler(s) Initials	DV	**Depth to Water (ft.)**	28.04
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,640	14.2	21,100	5.15	7.14	12.5	134
1,645	14.3	21,100	4.19	7.13	12.5	81.6
1,650	14.5	21,200	3.18	7.14	12.6	72.3
1,655	14.5	21,300	3.11	7.14	12.7	69.1
1,700	14.6	21,400	2.98	7.14	12.7	70.9

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Sample for radium only. Re-collecting samples lost in transit from Chemtech Ford to radium lab during analysis of May 2022 samples.

Water & Environmental TECHNOLOGIES

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480 East Park Street
Butte, Montana 59701
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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-12
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	18:45
Sampler(s) Initials	DV	**Depth to Water (ft.)**	21.35
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,820	12.2	22,000	1.07	7.41	13	76.1
1,825	12.2	22,000	0.98	7.46	13.1	43.2
1,830	12.2	22,000	0.88	7.47	13.1	41.6
1,835	12.2	22,100	0.82	7.48	13.1	38.9
1,840	12.2	22,100	0.82	7.49	13.1	37.8

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken.

Water & Environmental TECHNOLOGIES

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480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-12
Sampling Method	Low Flow Bladder Pump	**Sample Date**	May 4, 2022
Decon Method	Dedicated Equipment	**Sample Time**	18:10
Sampler(s) Initials	DV	**Depth to Water (ft.)**	21.41
Field Conditions	na		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,745	12.9	22,100	0.95	7.45	13.1	317
1,750	12.9	22,100	0.75	7.46	13.1	98
1,755	12.7	22,200	0.52	7.45	13.2	24.9
1,800	12.7	22,200	0.60	7.45	13.2	18.7
1,805	12.6	22,300	0.62	7.45	13.2	19.1

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Sample for radium only. Re-collecting samples lost in transit from Chemtech Ford to radium lab during analysis of May 2022 samples.

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Butte, Montana 59701
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Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM055	**Sample ID**	ELF-13
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	16:25
Sampler(s) Initials	DV	**Depth to Water (ft.)**	4.71
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,605	10.2	20,700	0.99	7.15	12.1	0
1,610	10.1	20,600	0.90	7.13	12.1	0
1,615	10.0	20,600	0.87	7.13	12.1	0
1,620	10.0	20,600	0.86	7.12	12.1	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP IS SALINITY.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-13
Sampling Method	Low Flow Bladder Pump	**Sample Date**	May 5, 2022
Decon Method	Dedicated Equipment	**Sample Time**	10:10
Sampler(s) Initials	DV	**Depth to Water (ft.)**	4.59
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
950	10.0	20,800	1.31	6.49	12.2	3.1
955	10.0	20,900	0.98	6.51	12.2	0
1,000	9.9	20,900	0.99	6.53	12.2	0
1,005	9.9	20,900	0.97	6.54	12.2	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Sample for radium only. Re-collecting samples lost in transit from Chemtech Ford to radium lab during analysis of May 2022 samples.

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
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Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-14
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	12:40
Sampler(s) Initials	DV	**Depth to Water (ft.)**	6.25
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,215	10.2	23,300	1.56	7.26	13.8	121
1,220	10.1	23,400	1.20	7.28	13.9	47.2
1,225	10.0	23,400	0.99	7.27	13.9	43.6
1,230	10.0	23,500	0.95	7.28	13.9	41.4
1,235	10.1	23,500	0.99	7.27	13.9	43.9

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken.

Water & Environmental TECHNOLOGIES

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Butte, Montana 59701
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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-15
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	15:35
Sampler(s) Initials	DV	**Depth to Water (ft.)**	7.79
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,505	11.8	21,100	1.80	7.15	12.4	101
1,510	11.6	21,000	1.08	7.16	12.4	93
1,515	11.6	21,000	1.12	7.16	12.4	51.7
1,520	11.5	21,000	1.18	7.16	12.4	52.3
1,525	11.5	21,100	1.20	7.16	12.4	52.3
1,530	11.4	21,100	1.21	7.16	12.4	53

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Low flow 12V pump - new wells - no dedicated pump yet

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
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Butte, Montana 59701
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Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-16
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	13:30
Sampler(s) Initials	DV	**Depth to Water (ft.)**	14.35
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
1,305	12.8	24,700	1.96	7.32	14.7	39.7
1,310	12.8	24,400	1.91	7.30	14.6	36.1
1,315	12.7	24,100	2.00	7.29	14.4	34
1,320	12.6	23,900	2.07	7.27	14.3	32.8
1,330	12.5	23,800	2.11	7.26	14.2	31.7

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

ORP is salinity, no ORP reading was taken. Low flow 12V pump, no other pump in well - newly drilled well

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PERCM052	**Sample ID**	ELF-17
Sampling Method	Low Flow Bladder Pump	**Sample Date**	April 6, 2022
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV	**Depth to Water (ft.)**	
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

No water. Dry.

Attachment E:

Laboratory Analytical Reports

CHEMTECH-FORD
LABORATORIES

4/21/2022

Work Order: 22D0654
Project: Hunter Power Plant CCR

Pacificorp Environmental Remediation
Attn: Brad Giles
1407 West North Temple Suite 270
Salt Lake City, UT 84140

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.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Reed Hendricks, Director of Operations

Chemtech-Ford Laboratories
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Sandy, UT 84070
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Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1407 West North Temple Suite 270
Salt Lake City, UT 84140

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **22D0654-01**
Date Sampled: **4/7/22 13:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	187	mg/L	100	EPA 300.0	4/16/22	4/16/22	
Fluoride	ND	mg/L	10.0	EPA 300.0	4/16/22	4/16/22	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:11	SPH
Sulfate	7780	mg/L	100	EPA 300.0	4/16/22	4/16/22	
Total Dissolved Solids (TDS)	12400	mg/L	50	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Arsenic, Total	0.0009	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Barium, Total	0.011	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Boron, Total	3.11	mg/L	0.05	EPA 200.7	4/13/22	4/18/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	
Calcium, Total	380	mg/L	0.2	EPA 200.7	4/13/22	4/18/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Cobalt, Total	0.0091	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lithium, Total	1.77	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0029	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Selenium, Total	0.0095	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	

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Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-4**

Matrix: **Water**
Lab ID: **22D0654-02**
Date Sampled: **4/7/22 11:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2060	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:12	SPH
Sulfate	5320	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	13000	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Arsenic, Total	0.0015	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Boron, Total	4.13	mg/L	0.05	EPA 200.7	4/18/22	4/19/22	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	
Calcium, Total	437	mg/L	0.2	EPA 200.7	4/18/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Cobalt, Total	0.0056	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lithium, Total	1.88	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0024	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Selenium, Total	0.0097	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	

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Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-5R**

Matrix: **Water**
Lab ID: **22D0654-03**
Date Sampled: **4/6/22 17:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2330	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.1	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:13	SPH
Sulfate	5970	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	14300	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Arsenic, Total	0.0129	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Barium, Total	0.013	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Boron, Total	4.31	mg/L	0.05	EPA 200.7	4/13/22	4/18/22	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	
Calcium, Total	423	mg/L	0.2	EPA 200.7	4/13/22	4/18/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Cobalt, Total	0.0047	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lithium, Total	3.94	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0044	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Selenium, Total	0.120	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Thallium, Total	0.0006	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	

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Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-6R**

Matrix: **Water**
Lab ID: **22D0654-04**
Date Sampled: **4/6/22 17:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2440	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:14	SPH
Sulfate	11700	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	29200	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Arsenic, Total	0.0016	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Barium, Total	0.013	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Boron, Total	2.64	mg/L	0.05	EPA 200.7	4/18/22	4/19/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	
Calcium, Total	341	mg/L	0.2	EPA 200.7	4/18/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Cobalt, Total	0.0049	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lithium, Total	2.81	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0022	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Selenium, Total	0.0432	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-7**

Matrix: **Water**
Lab ID: **22D0654-05**
Date Sampled: **4/6/22 20:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2710	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:15	SPH
Sulfate	7370	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	18800	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Arsenic, Total	0.0113	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Barium, Total	0.017	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Boron, Total	1.36	mg/L	0.05	EPA 200.7	4/13/22	4/18/22	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	
Calcium, Total	388	mg/L	0.2	EPA 200.7	4/13/22	4/18/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Cobalt, Total	0.0079	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lead, Total	0.0014	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lithium, Total	1.88	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0029	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Selenium, Total	0.129	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Thallium, Total	0.0006	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-8**

Matrix: **Water**
Lab ID: **22D0654-06**
Date Sampled: **4/7/22 10:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	1870	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:17	SPH
Sulfate	2790	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	4810	mg/L	33	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Arsenic, Total	0.0046	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	4/19/22	4/19/22	
Boron, Total	25.8	mg/L	0.05	EPA 200.7	4/19/22	4/19/22	
Cadmium, Total	0.0015	mg/L	0.0002	EPA 200.8	4/19/22	4/19/22	
Calcium, Total	506	mg/L	0.2	EPA 200.7	4/19/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Cobalt, Total	0.193	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lead, Total	0.0061	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lithium, Total	3.79	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.345	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Selenium, Total	0.0373	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Thallium, Total	0.0006	mg/L	0.0002	EPA 200.8	4/19/22	4/19/22	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-9**

Matrix: **Water**
Lab ID: **22D0654-07**
Date Sampled: **4/7/22 12:35**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	332	mg/L	100	EPA 300.0	4/16/22	4/16/22	
Fluoride	ND	mg/L	10.0	EPA 300.0	4/16/22	4/16/22	
pH	7.9	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:18	SPH
Sulfate	6440	mg/L	100	EPA 300.0	4/16/22	4/16/22	
Total Dissolved Solids (TDS)	10400	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	0.0010	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Arsenic, Total	0.0044	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Boron, Total	1.17	mg/L	0.05	EPA 200.7	4/19/22	4/19/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/19/22	4/19/22	
Calcium, Total	70.7	mg/L	0.2	EPA 200.7	4/19/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Cobalt, Total	0.0005	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lithium, Total	1.06	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0445	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Selenium, Total	0.0095	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/19/22	4/19/22	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-11**

Matrix: **Water**
Lab ID: **22D0654-08**
Date Sampled: **4/7/22 10:05**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	898	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.3	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:20	SPH
Sulfate	10500	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	22000	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Arsenic, Total	0.0034	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Barium, Total	0.028	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Boron, Total	14.3	mg/L	0.05	EPA 200.7	4/13/22	4/18/22	
Cadmium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	
Calcium, Total	390	mg/L	0.2	EPA 200.7	4/13/22	4/18/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Cobalt, Total	0.0211	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lead, Total	0.0018	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lithium, Total	3.86	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0185	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Selenium, Total	0.169	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-12**

Matrix: **Water**
Lab ID: **22D0654-09**
Date Sampled: **4/6/22 18:45**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	409	mg/L	200	EPA 300.0	4/16/22	4/16/22	
Fluoride	ND	mg/L	20.0	EPA 300.0	4/16/22	4/16/22	
pH	7.6	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:21	SPH
Sulfate	12200	mg/L	200	EPA 300.0	4/16/22	4/16/22	
Total Dissolved Solids (TDS)	9620	mg/L	50	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Arsenic, Total	0.0009	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Barium, Total	0.009	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Boron, Total	1.10	mg/L	0.05	EPA 200.7	4/18/22	4/19/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	
Calcium, Total	131	mg/L	0.2	EPA 200.7	4/18/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Cobalt, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lithium, Total	0.856	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Selenium, Total	0.0049	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	

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Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1407 West North Temple Suite 270
Salt Lake City, UT 84140

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-13**

Matrix: **Water**
Lab ID: **22D0654-10**
Date Sampled: **4/6/22 16:25**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2510	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:22	SPH
Sulfate	7590	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	16400	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0010	EPA 200.8	4/19/22	4/19/22	
Arsenic, Total	0.0023	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Barium, Total	0.009	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Boron, Total	0.46	mg/L	0.05	EPA 200.7	4/19/22	4/19/22	
Cadmium, Total	ND	mg/L	0.0004	EPA 200.8	4/19/22	4/19/22	
Calcium, Total	386	mg/L	0.2	EPA 200.7	4/19/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Cobalt, Total	0.0044	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lithium, Total	1.98	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0013	mg/L	0.0010	EPA 200.8	4/19/22	4/19/22	
Selenium, Total	0.0488	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/19/22	4/19/22	

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PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-14**

Matrix: **Water**
Lab ID: **22D0654-11**
Date Sampled: **4/6/22 12:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3650	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.2	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:26	
Sulfate	7770	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	19600	mg/L	100	SM 2540 C	4/15/22	4/15/22	APH-R
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Arsenic, Total	0.0151	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Boron, Total	1.90	mg/L	0.05	EPA 200.7	4/13/22	4/18/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	
Calcium, Total	438	mg/L	0.2	EPA 200.7	4/13/22	4/18/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Cobalt, Total	0.0072	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Lithium, Total	4.42	mg/L	0.005	EPA 200.7	4/13/22	4/18/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0037	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Selenium, Total	0.133	mg/L	0.0005	EPA 200.8	4/13/22	4/14/22	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/13/22	4/14/22	

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PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-15**

Matrix: **Water**
Lab ID: **22D0654-12**
Date Sampled: **4/6/22 15:35**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2380	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.3	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:28	
Sulfate	8180	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	18100	mg/L	500	SM 2540 C	4/15/22	4/15/22	APH-R
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Arsenic, Total	0.0015	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Barium, Total	0.014	mg/L	0.005	EPA 200.7	4/14/22	4/18/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Boron, Total	2.83	mg/L	0.05	EPA 200.7	4/14/22	4/18/22	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	
Calcium, Total	379	mg/L	0.2	EPA 200.7	4/14/22	4/18/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/14/22	4/18/22	
Cobalt, Total	0.0038	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lithium, Total	2.37	mg/L	0.005	EPA 200.7	4/14/22	4/18/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0029	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Selenium, Total	0.0264	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Thallium, Total	0.0002	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	

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PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-16**

Matrix: **Water**
Lab ID: **22D0654-13**
Date Sampled: **4/6/22 13:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3280	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.4	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:31	
Sulfate	8160	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	20000	mg/L	500	SM 2540 C	4/15/22	4/15/22	APH-R
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Arsenic, Total	0.0021	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Barium, Total	0.016	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Boron, Total	6.64	mg/L	0.05	EPA 200.7	4/18/22	4/19/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	
Calcium, Total	388	mg/L	0.2	EPA 200.7	4/18/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Cobalt, Total	0.0077	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lithium, Total	4.97	mg/L	0.005	EPA 200.7	4/18/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0046	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Selenium, Total	0.0453	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Thallium, Total	0.0003	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	

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PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **Duplicate - (CCR)**

Matrix: **Water**
Lab ID: **22D0654-14**
Date Sampled: **4/6/22 17:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3160	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	7.3	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:32	
Sulfate	7710	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	18500	mg/L	100	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Arsenic, Total	0.0022	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	4/14/22	4/18/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Boron, Total	4.08	mg/L	0.05	EPA 200.7	4/14/22	4/18/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	
Calcium, Total	396	mg/L	0.2	EPA 200.7	4/14/22	4/18/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/14/22	4/18/22	
Cobalt, Total	0.0037	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Lithium, Total	3.81	mg/L	0.005	EPA 200.7	4/14/22	4/18/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	0.0042	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Selenium, Total	0.0246	mg/L	0.0005	EPA 200.8	4/18/22	4/19/22	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	4/18/22	4/19/22	

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PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **Field Blank - (CCR)**

Matrix: **Water**
Lab ID: **22D0654-15**
Date Sampled: **4/7/22 12:35**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	ND	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Fluoride	ND	mg/L	50.0	EPA 300.0	4/12/22	4/13/22	
pH	6.8	pH Units	0.1	SM 4500 H-B	4/8/22 15:21	4/8/22 16:34	
Sulfate	ND	mg/L	500	EPA 300.0	4/12/22	4/13/22	
Total Dissolved Solids (TDS)	28	mg/L	20	SM 2540 C	4/13/22	4/13/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Arsenic, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Barium, Total	ND	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Boron, Total	ND	mg/L	0.05	EPA 200.7	4/19/22	4/19/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	4/19/22	4/19/22	
Calcium, Total	ND	mg/L	0.2	EPA 200.7	4/19/22	4/19/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Cobalt, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Lithium, Total	ND	mg/L	0.005	EPA 200.7	4/19/22	4/19/22	
Mercury, Total	ND	mg/L	0.0002	EPA 245.1	4/18/22	4/19/22	
Molybdenum, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Selenium, Total	ND	mg/L	0.0005	EPA 200.8	4/19/22	4/19/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	4/19/22	4/19/22	

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Brad Giles
1407 West North Temple Suite 270
Salt Lake City, UT 84140

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 4/21/2022
Project Name: **Hunter Power Plant CCR**

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-R = This sample was originally analyzed within the EPA-recommended holding time. The reported value was obtained from a confirmatory re-analysis that was performed outside of that holding time.
SPH = Sample submitted past method specified holding time.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

* RADS on 22D0656

22D0654 1 of 2

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																		Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined) *						Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
—	1. ELF-1D			W		4	x	x	x	x	x	x	x	x				x									
01	2. ELF-2	4/7/2022	13:30	W		4	x	x	x	x	x	x	x	x				x									
—	3. ELF-3			W		4	x	x	x	x	x	x	x	x				x									
02	4. ELF-4	4/7/2022	11:30	W		4	x	x	x	x	x	x	x	x				x									
03	5. ELF-5R	4/6/2022	17:50	W		4	x	x	x	x	x	x	x	x				x									
04	6. ELF-6R	4/6/2022	17:10	W		4	x	x	x	x	x	x	x	x				x									
05	7. ELF-7	4/6/2022	20:00	W		4	x	x	x	x	x	x	x	x				x									
06	8. ELF-8	4/7/2022	10:50	W		4	x	x	x	x	x	x	x	x				x									
07	9. ELF-9	4/7/2022	12:35	W		4	x	x	x	x	x	x	x	x				x									
—	10. ELF-10			W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 0.6

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
	4-8-22 12:37		4/8/22 12:37
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

2200654

2 of 2

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																		Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined) *						Total Colliform + E. coli (Present/Absent)	Total Colliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
08	1. ELF-11	4/7/2022	10:05	W		4	x	x	x	x	x	x	x	x				x									
09	2. ELF-12	4/6/2022	18:45	W		4	x	x	x	x	x	x	x	x				x									
10	3. ELF-13	4/6/2022	16:25	W		4	x	x	x	x	x	x	x	x				x									
11	4. ELF-14	4/6/2022	12:40	W		4	x	x	x	x	x	x	x	x				x									
12	5. ELF-15	4/6/2022	15.:35	W		4	x	x	x	x	x	x	x	x				x									
13	6. ELF-16	4/6/2022	13:30	W		4	x	x	x	x	x	x	x	x				x									
	7. ELF-17			W		4	x	x	x	x	x	x	x	x				x									
	8.																										
14	9. Duplicate - (CCR)	4/6/2022	17:50	W		4	x	x	x	x	x	x	x	x				x									
15	10. Field Blank - (CCR)	4/7/2022	12:35	W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek Sampled by: [signature] Bradley Giles

ON ICE NOT ON ICE Temp (C°): 0.6

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
[signature]	4-8-22 12:37	Dennis Brown	4-8-22 12:37
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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 agress to pay collection costs and attorney's fees.

Work Order # 22D0054

CHEMTECH FORD LABORATORIES
Sample Receipt

CHEMTECH-FORD LABORATORIES

Delivery Method:

- ☐ UPS
- ☐ USPS
- ☐ FedEx
- ☐ Chemtech Courier
- ☑ Walk-in
- ☐ Customer Courier

Receiving Temperature 0.6 °C

Sample #	Container	Chemtech Lot # or Preservative	Number of Subsamples	Preserved by Client/Third Party	Preserved in Receiving/Laboratory	Filtered in Field by Client	Misc Volume (oz/mL)	Comments
01-15	AG	1171						
	M	1186						

Sample Condition
(check if *yes*)

- ☐ Custody Seals
- ☑ Containers Intact
- ☑ COC can be matched to bottles
- ☑ Received on Ice
- ☑ Correct Containers(s)
- ☑ Sufficent Sample Volume
- ☐ Headspace Present (VOC)
- ☐ Temperature Blank
- ☑ Received within Holding Time

Plastic Containers

A- Plastic Unpreserved
B- Miscellaneous Plastic
C- Cyanide Qt (NaOH)
E- Coliform/Ecoli/HPC
F- Sulfide Qt (Zn Acetate)
L- Mercury 1631
M- Metals Pint (HNO3)
N- Nutrient Pint (H2SO4)
R- Radiological (HNO3)
S- Sludge Cups/Tubs
Q- Plastic Bag

Glass Containers

D- 625 (Na2S2O3)
G- Glass Unpreserved
H- HAAs (NH4Cl)
J- 508/515/525 (Na2SO3)
K- 515.3 Herbicides
O- Oil & Grease (HCl)
P- Phenols (H2SO4)
T- TOC/TOX (H3PO4)
U- 531 (MCAA, Na2S2O3)
V- 524/THMs (Ascorbic Acid)
W- 8260 VOC (1:1 HCl)
X- Vial Unpreserved
Y- 624/504 (Na2S2O3)
Z- Miscellaneous Glass

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.7									
QC Sample ID: BWD0544-BLK1	Batch: BWD0544								
Date Prepared: 04/13/2022	Date Analyzed: 04/15/2022								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					0.005			0.005	1.00
QC Sample ID: BWD0613-BLK1	Batch: BWD0613								
Date Prepared: 04/14/2022	Date Analyzed: 04/18/2022								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BWD0740-BLK1	Batch: BWD0740								
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BWD0762-BLK1	Batch: BWD0762								
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
LCS - EPA 200.7									
QC Sample ID: BWD0544-BS1	Batch: BWD0544								
Date Prepared: 04/13/2022	Date Analyzed: 04/15/2022								
Barium, Total	97.2		85 - 115		0.194		0.200	0.005	1.00
Boron, Total	97.0		85 - 115		0.49		0.500	0.05	1.00
Calcium, Total	92.5		85 - 115		9.4		10.2	0.2	1.00
Chromium, Total	102		85 - 115		0.203		0.200	0.005	1.00
Lithium, Total	107		85 - 115		0.213		0.200	0.005	1.00
QC Sample ID: BWD0613-BS1	Batch: BWD0613								
Date Prepared: 04/14/2022	Date Analyzed: 04/18/2022								
Barium, Total	104		85 - 115		0.208		0.200	0.005	1.00
Boron, Total	105		85 - 115		0.52		0.500	0.05	1.00
Calcium, Total	96.9		85 - 115		9.9		10.2	0.2	1.00
Chromium, Total	106		85 - 115		0.212		0.200	0.005	1.00
Lithium, Total	103		85 - 115		0.206		0.200	0.005	1.00
QC Sample ID: BWD0740-BS1	Batch: BWD0740								
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Barium, Total	104		85 - 115		0.208		0.200	0.005	1.00
Boron, Total	103		85 - 115		0.52		0.500	0.05	1.00
Calcium, Total	97.9		85 - 115		10.0		10.2	0.2	1.00
Chromium, Total	106		85 - 115		0.212		0.200	0.005	1.00
Lithium, Total	110		85 - 115		0.220		0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
LCS - EPA 200.7 (cont.)									
QC Sample ID: BWD0762-BS1	Batch: BWD0762								
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Barium, Total	104		85 - 115		0.208		0.200	0.005	1.00
Boron, Total	100		85 - 115		0.50		0.500	0.05	1.00
Calcium, Total	92.5		85 - 115		9.4		10.2	0.2	1.00
Chromium, Total	102		85 - 115		0.203		0.200	0.005	1.00
Lithium, Total	105		85 - 115		0.210		0.200	0.005	1.00
Matrix Spike - EPA 200.7									
QC Sample ID: BWD0544-MS1	Batch: BWD0544				QC Source Sample: 22D0654-01				
Date Prepared: 04/13/2022	Date Analyzed: 04/18/2022								
Barium, Total	103		70 - 130		0.218	0.011	0.200	0.005	1.00
Boron, Total	84.4		70 - 130		3.53	3.11	0.500	0.05	1.00
Calcium, Total	-30.3		70 - 130		377	380	10.2	0.2	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.									
Chromium, Total	103		70 - 130		0.208	0.002	0.200	0.005	1.00
Lithium, Total	75.7		70 - 130		1.92	1.77	0.200	0.005	1.00
QC Sample ID: BWD0544-MS2	Batch: BWD0544				QC Source Sample: XXXXXXX-XX				
Date Prepared: 04/13/2022	Date Analyzed: 04/18/2022								
Barium, Total	109		70 - 130		0.670	0.453	0.200	0.005	1.00
Boron, Total	106		70 - 130		0.71	0.18	0.500	0.05	1.00
Calcium, Total	132		70 - 130		266	252	10.2	0.2	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.									
Chromium, Total	102		70 - 130		0.214	0.009	0.200	0.005	1.00
Lithium, Total	116		70 - 130		0.293	0.062	0.200	0.005	1.00
QC Sample ID: BWD0613-MS1	Batch: BWD0613				QC Source Sample: XXXXXXX-XX				
Date Prepared: 04/14/2022	Date Analyzed: 04/18/2022								
Barium, Total	101		70 - 130		0.290	0.088	0.200	0.005	1.00
Boron, Total	100		70 - 130		0.78	0.28	0.500	0.05	1.00
Calcium, Total	87.7		70 - 130		59.1	50.2	10.2	0.2	1.00
Chromium, Total	102		70 - 130		0.205	ND	0.200	0.005	1.00
Lithium, Total	113		70 - 130		0.234	0.008	0.200	0.005	1.00
QC Sample ID: BWD0613-MS2	Batch: BWD0613				QC Source Sample: XXXXXXX-XX				
Date Prepared: 04/14/2022	Date Analyzed: 04/18/2022								
Barium, Total	99.6		70 - 130		0.347	0.148	0.200	0.005	1.00
Boron, Total	102		70 - 130		0.52	0.01	0.500	0.05	1.00
Calcium, Total	89.1		70 - 130		51.0	41.9	10.2	0.2	1.00
Chromium, Total	102		70 - 130		0.205	0.0003	0.200	0.005	1.00
Lithium, Total	99.6		70 - 130		0.199	ND	0.200	0.005	1.00
QC Sample ID: BWD0740-MS1	Batch: BWD0740				QC Source Sample: XXXXXXX-XX				
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Barium, Total	105		70 - 130		0.217	0.006	0.200	0.005	1.00
Boron, Total	103		70 - 130		0.68	0.17	0.500	0.05	1.00
Calcium, Total	97.3		70 - 130		11.1	1.1	10.2	0.2	1.00
Chromium, Total	106		70 - 130		0.214	0.002	0.200	0.005	1.00
Lithium, Total	118		70 - 130		0.264	0.029	0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 200.7 (cont.)									
QC Sample ID: BWD0740-MS2	Batch: BWD0740		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Barium, Total	105		70 - 130		0.228	0.018	0.200	0.005	1.00
Boron, Total	104		70 - 130		1.20	0.67	0.500	0.05	1.00
Calcium, Total	102		70 - 130		56.2	45.8	10.2	0.2	1.00
Chromium, Total	104		70 - 130		0.208	0.0003	0.200	0.005	1.00
Lithium, Total	111		70 - 130		0.413	0.192	0.200	0.005	1.00
QC Sample ID: BWD0762-MS1	Batch: BWD0762		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Barium, Total	104		70 - 130		0.348	0.139	0.200	0.005	1.00
Boron, Total	102		70 - 130		0.56	0.05	0.500	0.05	1.00
Calcium, Total	90.9		70 - 130		73.5	64.2	10.2	0.2	1.00
Chromium, Total	103		70 - 130		0.208	0.001	0.200	0.005	1.00
Lithium, Total	117		70 - 130		0.242	0.009	0.200	0.005	1.00
QC Sample ID: BWD0762-MS2	Batch: BWD0762		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Barium, Total	103		70 - 130		0.230	0.024	0.200	0.005	1.00
Boron, Total	102		70 - 130		0.53	0.02	0.500	0.05	1.00
Calcium, Total	69.3		70 - 130		134	127	10.2	0.2	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.									
Chromium, Total	98.8		70 - 130		0.198	0.0006	0.200	0.005	1.00
Lithium, Total	110		70 - 130		0.220	ND	0.200	0.005	1.00
Matrix Spike Dup - EPA 200.7									
QC Sample ID: BWD0544-MSD1	Batch: BWD0544		QC Source Sample: 22D0654-01						
Date Prepared: 04/13/2022	Date Analyzed: 04/18/2022								
Barium, Total	100	3.17	70 - 130	20	0.211	0.011	0.200	0.005	1.00
Boron, Total	70.7	1.95	70 - 130	20	3.46	3.11	0.500	0.05	1.00
Calcium, Total	-65.6	0.960	70 - 130	20	373	380	10.2	0.2	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.									
Chromium, Total	101	2.43	70 - 130	20	0.203	0.002	0.200	0.005	1.00
Lithium, Total	49.8	2.73	70 - 130	20	1.87	1.77	0.200	0.005	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.									
QC Sample ID: BWD0544-MSD2	Batch: BWD0544		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2022	Date Analyzed: 04/18/2022								
Barium, Total	110	0.357	70 - 130	20	0.673	0.453	0.200	0.005	1.00
Boron, Total	105	0.479	70 - 130	20	0.71	0.18	0.500	0.05	1.00
Calcium, Total	110	0.847	70 - 130	20	264	252	10.2	0.2	1.00
Chromium, Total	101	1.08	70 - 130	20	0.212	0.009	0.200	0.005	1.00
Lithium, Total	115	0.478	70 - 130	20	0.292	0.062	0.200	0.005	1.00
QC Sample ID: BWD0613-MSD1	Batch: BWD0613		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/14/2022	Date Analyzed: 04/18/2022								
Barium, Total	100	0.864	70 - 130	20	0.288	0.088	0.200	0.005	1.00
Boron, Total	97.8	1.46	70 - 130	20	0.77	0.28	0.500	0.05	1.00
Calcium, Total	80.1	1.33	70 - 130	20	58.4	50.2	10.2	0.2	1.00
Chromium, Total	103	0.341	70 - 130	20	0.206	ND	0.200	0.005	1.00
Lithium, Total	112	0.989	70 - 130	20	0.231	0.008	0.200	0.005	1.00

Matrix Spike Dup - EPA 200.7 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BWD0613-MSD2	Batch: BWD0613		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/14/2022	Date Analyzed: 04/18/2022								
Barium, Total	98.2	0.811	70 - 130	20	0.344	0.148	0.200	0.005	1.00
Boron, Total	101	0.964	70 - 130	20	0.52	0.01	0.500	0.05	1.00
Calcium, Total	83.8	1.05	70 - 130	20	50.5	41.9	10.2	0.2	1.00
Chromium, Total	99.1	3.12	70 - 130	20	0.198	0.0003	0.200	0.005	1.00
Lithium, Total	97.6	1.93	70 - 130	20	0.195	ND	0.200	0.005	1.00
QC Sample ID: BWD0740-MSD1	Batch: BWD0740		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Barium, Total	104	1.25	70 - 130	20	0.214	0.006	0.200	0.005	1.00
Boron, Total	101	1.31	70 - 130	20	0.68	0.17	0.500	0.05	1.00
Calcium, Total	96.3	0.917	70 - 130	20	11.0	1.1	10.2	0.2	1.00
Chromium, Total	105	1.65	70 - 130	20	0.211	0.002	0.200	0.005	1.00
Lithium, Total	114	2.45	70 - 130	20	0.258	0.029	0.200	0.005	1.00
QC Sample ID: BWD0740-MSD2	Batch: BWD0740		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Barium, Total	103	1.50	70 - 130	20	0.224	0.018	0.200	0.005	1.00
Boron, Total	99.7	1.98	70 - 130	20	1.17	0.67	0.500	0.05	1.00
Calcium, Total	88.4	2.52	70 - 130	20	54.8	45.8	10.2	0.2	1.00
Chromium, Total	103	0.626	70 - 130	20	0.207	0.0003	0.200	0.005	1.00
Lithium, Total	108	1.41	70 - 130	20	0.408	0.192	0.200	0.005	1.00
QC Sample ID: BWD0762-MSD1	Batch: BWD0762		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Barium, Total	105	0.172	70 - 130	20	0.349	0.139	0.200	0.005	1.00
Boron, Total	102	0.409	70 - 130	20	0.56	0.05	0.500	0.05	1.00
Calcium, Total	87.3	0.496	70 - 130	20	73.2	64.2	10.2	0.2	1.00
Chromium, Total	105	1.95	70 - 130	20	0.212	0.001	0.200	0.005	1.00
Lithium, Total	120	2.41	70 - 130	20	0.248	0.009	0.200	0.005	1.00
QC Sample ID: BWD0762-MSD2	Batch: BWD0762		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Barium, Total	103	0.436	70 - 130	20	0.229	0.024	0.200	0.005	1.00
Boron, Total	101	0.817	70 - 130	20	0.52	0.02	0.500	0.05	1.00
Calcium, Total	57.2	0.928	70 - 130	20	133	127	10.2	0.2	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.									
Chromium, Total	97.5	1.27	70 - 130	20	0.196	0.0006	0.200	0.005	1.00
Lithium, Total	107	2.30	70 - 130	20	0.215	ND	0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.8									
QC Sample ID: BWD0545-BLK1	Batch: BWD0545								
Date Prepared: 04/13/2022	Date Analyzed: 04/14/2022								
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
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
QC Sample ID: BWD0743-BLK1	Batch: BWD0743								
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
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
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
QC Sample ID: BWD0759-BLK1	Batch: BWD0759								
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
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
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
LCS - EPA 200.8									
QC Sample ID: BWD0545-BS1	Batch: BWD0545								
Date Prepared: 04/13/2022	Date Analyzed: 04/14/2022								
Antimony, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Arsenic, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Cadmium, Total	99.0		85 - 115		0.040		0.0400	0.0002	1.00
Cobalt, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Lead, Total	98.0		85 - 115		0.039		0.0400	0.0005	1.00
Molybdenum, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Selenium, Total	102		85 - 115		0.041		0.0400	0.0005	1.00
Thallium, Total	104		85 - 115		0.041		0.0400	0.0002	1.00
QC Sample ID: BWD0743-BS1	Batch: BWD0743								
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Antimony, Total	102		85 - 115		0.041		0.0400	0.0005	1.00
Arsenic, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	110		85 - 115		0.044		0.0400	0.0005	1.00
Cadmium, Total	99.8		85 - 115		0.040		0.0400	0.0002	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
LCS - EPA 200.8 (cont.)									
QC Sample ID: BWD0743-BS1	Batch: BWD0743								
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Cobalt, Total	96.7		85 - 115		0.039		0.0400	0.0005	1.00
Lead, Total	98.8		85 - 115		0.040		0.0400	0.0005	1.00
Molybdenum, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Selenium, Total	99.9		85 - 115		0.040		0.0400	0.0005	1.00
Thallium, Total	101		85 - 115		0.040		0.0400	0.0002	1.00
QC Sample ID: BWD0759-BS1	Batch: BWD0759								
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Antimony, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Arsenic, Total	99.4		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Cadmium, Total	95.9		85 - 115		0.038		0.0400	0.0002	1.00
Cobalt, Total	95.8		85 - 115		0.038		0.0400	0.0005	1.00
Lead, Total	97.3		85 - 115		0.039		0.0400	0.0005	1.00
Molybdenum, Total	99.9		85 - 115		0.040		0.0400	0.0005	1.00
Selenium, Total	106		85 - 115		0.042		0.0400	0.0005	1.00
Thallium, Total	103		85 - 115		0.041		0.0400	0.0002	1.00
Matrix Spike - EPA 200.8									
QC Sample ID: BWD0545-MS1	Batch: BWD0545			QC Source Sample: 22D0654-01					
Date Prepared: 04/13/2022	Date Analyzed: 04/14/2022								
Antimony, Total	108		70 - 130		0.043	0.0001	0.0400	0.0005	1.00
Arsenic, Total	104		70 - 130		0.042	0.0009	0.0400	0.0005	1.00
Beryllium, Total	86.4		70 - 130		0.035	ND	0.0400	0.0005	1.00
Cadmium, Total	95.3		70 - 130		0.038	0.00006	0.0400	0.0002	1.00
Cobalt, Total	94.0		70 - 130		0.047	0.009	0.0400	0.0005	1.00
Lead, Total	92.0		70 - 130		0.037	0.0002	0.0400	0.0005	1.00
Molybdenum, Total	110		70 - 130		0.047	0.003	0.0400	0.0005	1.00
Selenium, Total	128		70 - 130		0.061	0.010	0.0400	0.0005	1.00
Thallium, Total	96.2		70 - 130		0.039	0.0001	0.0400	0.0002	1.00
QC Sample ID: BWD0545-MS2	Batch: BWD0545			QC Source Sample: XXXXXXX-XX					
Date Prepared: 04/13/2022	Date Analyzed: 04/14/2022								
Antimony, Total	107		70 - 130		0.048	0.005	0.0400	0.0005	1.00
Arsenic, Total	103		70 - 130		0.056	0.015	0.0400	0.0005	1.00
Beryllium, Total	101		70 - 130		0.041	0.00006	0.0400	0.0005	1.00
Cadmium, Total	98.7		70 - 130		0.040	0.00005	0.0400	0.0002	1.00
Cobalt, Total	88.0		70 - 130		0.036	0.0007	0.0400	0.0005	1.00
Lead, Total	96.3		70 - 130		0.039	0.0004	0.0400	0.0005	1.00
Molybdenum, Total	110		70 - 130		0.072	0.028	0.0400	0.0005	1.00
Selenium, Total	106		70 - 130		0.047	0.005	0.0400	0.0005	1.00
Thallium, Total	100		70 - 130		0.040	0.00004	0.0400	0.0002	1.00
QC Sample ID: BWD0743-MS1	Batch: BWD0743			QC Source Sample: XXXXXXX-XX					
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Antimony, Total	98.2		70 - 130		0.046	0.007	0.0400	0.0025	5.00
Arsenic, Total	95.8		70 - 130		0.137	0.099	0.0400	0.0025	5.00
Cadmium, Total	90.0		70 - 130		0.037	0.001	0.0400	0.0010	5.00
Cobalt, Total	86.5		70 - 130		0.036	0.002	0.0400	0.0025	5.00
Lead, Total	86.6		70 - 130		0.038	0.003	0.0400	0.0025	5.00
Molybdenum, Total	104		70 - 130		0.067	0.025	0.0400	0.0025	5.00
Selenium, Total	90.6		70 - 130		0.063	0.027	0.0400	0.0025	5.00
Thallium, Total	88.0		70 - 130		0.035	ND	0.0400	0.0010	5.00

Matrix Spike - EPA 200.8 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BWD0743-MS2	Batch: BWD0743		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Antimony, Total	103		70 - 130		0.041	0.0002	0.0400	0.0005	1.00
Arsenic, Total	101		70 - 130		0.056	0.015	0.0400	0.0005	1.00
Beryllium, Total	109		70 - 130		0.044	ND	0.0400	0.0005	1.00
Cadmium, Total	98.0		70 - 130		0.039	0.00005	0.0400	0.0002	1.00
Cobalt, Total	91.8		70 - 130		0.037	0.0005	0.0400	0.0005	1.00
Lead, Total	93.7		70 - 130		0.038	0.0001	0.0400	0.0005	1.00
Molybdenum, Total	106		70 - 130		0.047	0.004	0.0400	0.0005	1.00
Selenium, Total	97.3		70 - 130		0.039	0.0004	0.0400	0.0005	1.00
Thallium, Total	96.8		70 - 130		0.039	ND	0.0400	0.0002	1.00
QC Sample ID: BWD0759-MS1	Batch: BWD0759		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Antimony, Total	102		70 - 130		0.041	0.00007	0.0400	0.0005	1.00
Arsenic, Total	96.3		70 - 130		0.041	0.002	0.0400	0.0005	1.00
Beryllium, Total	100		70 - 130		0.040	ND	0.0400	0.0005	1.00
Cadmium, Total	91.8		70 - 130		0.037	ND	0.0400	0.0002	1.00
Cobalt, Total	86.2		70 - 130		0.035	0.0002	0.0400	0.0005	1.00
Lead, Total	90.9		70 - 130		0.037	0.0005	0.0400	0.0005	1.00
Molybdenum, Total	99.5		70 - 130		0.041	0.0008	0.0400	0.0005	1.00
Selenium, Total	21.0		70 - 130		0.045	0.036	0.0400	0.0005	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.									
Thallium, Total	98.6		70 - 130		0.039	0.00003	0.0400	0.0002	1.00
QC Sample ID: BWD0759-MS2	Batch: BWD0759		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/19/2022	Date Analyzed: 04/19/2022								
Antimony, Total	104		70 - 130		0.042	0.0001	0.0400	0.0005	1.00
Arsenic, Total	97.3		70 - 130		0.040	0.0009	0.0400	0.0005	1.00
Beryllium, Total	102		70 - 130		0.041	ND	0.0400	0.0005	1.00
Cadmium, Total	93.5		70 - 130		0.037	0.00005	0.0400	0.0002	1.00
Cobalt, Total	88.0		70 - 130		0.035	0.0002	0.0400	0.0005	1.00
Lead, Total	91.2		70 - 130		0.039	0.002	0.0400	0.0005	1.00
Molybdenum, Total	98.5		70 - 130		0.040	0.0005	0.0400	0.0005	1.00
Selenium, Total	98.6		70 - 130		0.040	0.0006	0.0400	0.0005	1.00
Thallium, Total	97.6		70 - 130		0.039	ND	0.0400	0.0002	1.00

QC Report for Work Order (WO) - 22D0654

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 245.1									
QC Sample ID: BWD0725-BLK1	Batch: BWD0725								
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Mercury, Total					ND			0.0002	1.00
LCS - EPA 245.1									
QC Sample ID: BWD0725-BS1	Batch: BWD0725								
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Mercury, Total	107		85 - 115		0.0053		0.00500	0.0002	1.00
Matrix Spike - EPA 245.1									
QC Sample ID: BWD0725-MS1	Batch: BWD0725		QC Source Sample: 22D0654-01						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Mercury, Total	108		75 - 125		0.0054	ND	0.00500	0.0002	1.00
QC Sample ID: BWD0725-MS2	Batch: BWD0725		QC Source Sample: 22D0654-02						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Mercury, Total	92.8		75 - 125		0.0046	ND	0.00500	0.0002	1.00
Matrix Spike Dup - EPA 245.1									
QC Sample ID: BWD0725-MSD1	Batch: BWD0725		QC Source Sample: 22D0654-01						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Mercury, Total	111	2.76	75 - 125	20	0.0056	ND	0.00500	0.0002	1.00
QC Sample ID: BWD0725-MSD2	Batch: BWD0725		QC Source Sample: 22D0654-02						
Date Prepared: 04/18/2022	Date Analyzed: 04/19/2022								
Mercury, Total	86.6	6.89	75 - 125	20	0.0043	ND	0.00500	0.0002	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 300.0									
QC Sample ID: BWD0459-BLK1	Batch: BWD0459								
Date Prepared: 04/12/2022	Date Analyzed: 04/13/2022								
Chloride					ND			1.0	1.00
Fluoride					ND			0.1	1.00
Sulfate					ND			1.0	1.00
QC Sample ID: BWD0677-BLK1	Batch: BWD0677								
Date Prepared: 04/16/2022	Date Analyzed: 04/16/2022								
Chloride					ND			1.0	1.00
Fluoride					ND			0.1	1.00
Sulfate					ND			1.0	1.00
LCS - EPA 300.0									
QC Sample ID: BWD0459-BS1	Batch: BWD0459								
Date Prepared: 04/12/2022	Date Analyzed: 04/13/2022								
Chloride	94.1		90 - 110		47.1		50.0	1.0	1.00
Fluoride	94.1		90 - 110		4.7		5.00	0.1	1.00
Sulfate	92.2		90 - 110		46.1		50.0	1.0	1.00
QC Sample ID: BWD0677-BS1	Batch: BWD0677								
Date Prepared: 04/16/2022	Date Analyzed: 04/16/2022								
Chloride	96.1		90 - 110		48.1		50.0	1.0	1.00
Fluoride	91.6		90 - 110		4.6		5.00	0.1	1.00
Sulfate	94.0		90 - 110		47.0		50.0	1.0	1.00
Matrix Spike - EPA 300.0									
QC Sample ID: BWD0459-MS1	Batch: BWD0459			QC Source Sample: 22D0654-01					
Date Prepared: 04/12/2022	Date Analyzed: 04/13/2022								
Chloride	91.6		80 - 120		4790	208	5000	500	1.00
Fluoride	81.4		80 - 120		407	ND	500	50.0	1.00
Sulfate	76.2		80 - 120		11000	7240	5000	500	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.									
QC Sample ID: BWD0459-MS2	Batch: BWD0459			QC Source Sample: 22D0654-15					
Date Prepared: 04/12/2022	Date Analyzed: 04/13/2022								
Chloride	83.1		80 - 120		4150	ND	5000	500	1.00
Fluoride	75.4		80 - 120		377	ND	500	50.0	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	77.3		80 - 120		3860	ND	5000	500	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.									
QC Sample ID: BWD0677-MS1	Batch: BWD0677			QC Source Sample: 22D0654-01					
Date Prepared: 04/16/2022	Date Analyzed: 04/16/2022								
Chloride	111		80 - 120		1300	187	1000	110	1.00
Fluoride	90.5		80 - 120		90.5	ND	100	11.0	1.00
Sulfate	97.7		80 - 120		8760	7780	1000	110	1.00
QC Sample ID: BWD0677-MS2	Batch: BWD0677			QC Source Sample: XXXXXXX-XX					
Date Prepared: 04/16/2022	Date Analyzed: 04/16/2022								
Chloride	96.2		80 - 120		65.3	54.7	11.1	1.1	1.00
Fluoride	99.8		80 - 120		1.8	0.7	1.11	0.1	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 300.0 (cont.)									
QC Sample ID: BWD0677-MS2	Batch: BWD0677		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/16/2022	Date Analyzed: 04/16/2022								
Sulfate	95.1		80 - 120		45.0	34.4	11.1	1.1	1.00
Matrix Spike Dup - EPA 300.0									
QC Sample ID: BWD0459-MSD1	Batch: BWD0459		QC Source Sample: 22D0654-01						
Date Prepared: 04/12/2022	Date Analyzed: 04/13/2022								
Chloride	91.9	0.355	80 - 120	20	4800	208	5000	500	1.00
Fluoride	72.8	11.1	80 - 120	20	364	ND	500	50.0	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	78.5	1.02	80 - 120	20	11200	7240	5000	500	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.									
QC Sample ID: BWD0459-MSD2	Batch: BWD0459		QC Source Sample: 22D0654-15						
Date Prepared: 04/12/2022	Date Analyzed: 04/13/2022								
Chloride	83.7	0.741	80 - 120	20	4180	ND	5000	500	1.00
Fluoride	74.4	1.34	80 - 120	20	372	ND	500	50.0	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	77.7	0.519	80 - 120	20	3880	ND	5000	500	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.									
QC Sample ID: BWD0677-MSD1	Batch: BWD0677		QC Source Sample: 22D0654-01						
Date Prepared: 04/16/2022	Date Analyzed: 04/16/2022								
Chloride	103	6.94	80 - 120	20	1210	187	1000	110	1.00
Fluoride	83.3	8.33	80 - 120	20	83.3	ND	100	11.0	1.00
Sulfate	96.1	0.183	80 - 120	20	8740	7780	1000	110	1.00
QC Sample ID: BWD0677-MSD2	Batch: BWD0677		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/16/2022	Date Analyzed: 04/16/2022								
Chloride	94.8	0.225	80 - 120	20	65.2	54.7	11.1	1.1	1.00
Fluoride	97.4	1.56	80 - 120	20	1.7	0.7	1.11	0.1	1.00
Sulfate	94.8	0.0738	80 - 120	20	45.0	34.4	11.1	1.1	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BWD0523-BLK1	Batch: BWD0523								
Date Prepared: 04/13/2022	Date Analyzed: 04/13/2022								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BWD0523-BS1	Batch: BWD0523								
Date Prepared: 04/13/2022	Date Analyzed: 04/13/2022								
Total Dissolved Solids (TDS)	97		90 - 110		388		400	20	1.00
QC Sample ID: BWD0523-DUP1	Batch: BWD0523		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/13/2022	Date Analyzed: 04/13/2022								
Total Dissolved Solids (TDS)		14		10	1990	2280		50	1.00
QM-04 - Visual evaluation of the sample indicates the RPD is above the control limit due to a non-homogeneous sample matrix.									
QC Sample ID: BWD0523-DUP2	Batch: BWD0523		QC Source Sample: 22D0654-01						
Date Prepared: 04/13/2022	Date Analyzed: 04/13/2022								
Total Dissolved Solids (TDS)		4		10	11900	12400		50	1.00
Blank - SM 2540 C									
QC Sample ID: BWD0656-BLK1	Batch: BWD0656								
Date Prepared: 04/15/2022	Date Analyzed: 04/15/2022								
Total Dissolved Solids (TDS)					ND			10	1.00
Duplicate - SM 2540 C									
QC Sample ID: BWD0656-DUP1	Batch: BWD0656		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/15/2022	Date Analyzed: 04/15/2022								
Total Dissolved Solids (TDS)		7		10	228	212		20	1.00
QC Sample ID: BWD0656-DUP2	Batch: BWD0656		QC Source Sample: XXXXXXX-XX						
Date Prepared: 04/15/2022	Date Analyzed: 04/15/2022								
Total Dissolved Solids (TDS)		10		10	23900	26500		500	1.00
LCS - SM 2540 C									
QC Sample ID: BWD0656-BS1	Batch: BWD0656								
Date Prepared: 04/15/2022	Date Analyzed: 04/15/2022								
Total Dissolved Solids (TDS)			90 - 110		408			20	1.00

CHEMTECH-FORD
LABORATORIES

6/16/2022

Work Order: 22D0656
Project: Hunter Power Plant CCR

Pacificorp Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

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.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Patrick Noteboom, Project Manager

Pacificorp Environmental Remediation
Brad Giles

REPORT NARRATIVE

Sample Group

Laboratory ID	Sample Name
22D0656-01	ELF-2
22D0656-02	ELF-4
22D0656-03	ELF-5R
22D0656-04	ELF-6R
22D0656-05	ELF-7
22D0656-06	ELF-8
22D0656-07	ELF-9
22D0656-08	ELF-11
22D0656-09	ELF-12
22D0656-10	ELF-13
22D0656-11	ELF-14
22D0656-12	ELF-15
22D0656-13	ELF-16
22D0656-14	Duplicate - (CCR)
22D0656-15	Field Blank - (CCR)

Samples 22D0656-06 to -10 were canceled due to the cooler containing those samples was lost in transit to the subcontract lab.

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Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **22D0656-01**
Date Sampled: **4/7/22 13:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.25	pCi/L	0.30	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	2.4	pCi/L	0.81	EPA 904.0	5/10/22	5/17/22	SL-20

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Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-4**

Matrix: **Water**
Lab ID: **22D0656-02**
Date Sampled: **4/7/22 11:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.15	pCi/L	0.38	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	2.4	pCi/L	0.79	EPA 904.0	5/10/22	5/17/22	SL-20

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Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-5R**

Matrix: **Water**
Lab ID: **22D0656-03**
Date Sampled: **4/6/22 17:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	1.1	pCi/L	0.25	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	2.6	pCi/L	0.80	EPA 904.0	5/10/22	5/17/22	SL-20

Chemtech-Ford Laboratories
Serving the Intermountain West Since 1953

9632 South 500 West
Sandy, UT 84070
O:(801) 262-7299 F: (866) 792-0093
www.ChemtechFord.com

Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-6R**

Matrix: **Water**
Lab ID: **22D0656-04**
Date Sampled: **4/6/22 17:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.20	pCi/L	0.32	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	1.5	pCi/L	0.95	EPA 904.0	5/10/22	5/17/22	SL-20

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Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-7**

Matrix: **Water**
Lab ID: **22D0656-05**
Date Sampled: **4/6/22 20:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.48	pCi/L	0.26	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	2.9	pCi/L	0.99	EPA 904.0	5/10/22	5/17/22	SL-20

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Certificate of Analysis

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-14**

Matrix: **Water**
Lab ID: **22D0656-11**
Date Sampled: **4/6/22 12:40**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.41	pCi/L	0.25	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	3.1	pCi/L	0.91	EPA 904.0	5/10/22	5/17/22	SL-20

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-15**

Matrix: **Water**
Lab ID: **22D0656-12**
Date Sampled: **4/6/22 15:35**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.28	pCi/L	0.33	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	2.7	pCi/L	0.82	EPA 904.0	5/10/22	5/17/22	SL-20

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Brad Giles
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Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-16**

Matrix: **Water**
Lab ID: **22D0656-13**
Date Sampled: **4/6/22 13:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.68	pCi/L	0.22	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	2.2	pCi/L	0.81	EPA 904.0	5/10/22	5/17/22	SL-20

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **Duplicate - (CCR)**

Matrix: **Water**
Lab ID: **22D0656-14**
Date Sampled: **4/6/22 17:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.68	pCi/L	0.26	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	2.8	pCi/L	1.0	EPA 904.0	5/10/22	5/17/22	SL-20

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Certificate of Analysis

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **Field Blank - (CCR)**

Matrix: **Water**
Lab ID: **22D0656-15**

Date Sampled: **4/7/22 12:35**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	0.37	pCi/L	0.25	EPA 903.1	5/9/22	5/19/22	SL-20
Radium-228	0.27	pCi/L	0.89	EPA 904.0	5/10/22	5/17/22	SL-20

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **4/8/22 12:37 @ 0.6** °C
Date Reported: 6/16/2022
Project Name: **Hunter Power Plant CCR**

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

SL-20 = Analysis performed by ALS Fort Collins, 225 Commerce Dr., Fort Collins, CO 80524.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

22D0656

1 of 2

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																	Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
—	1. ELF-1D			W		4	x	x	x	x	x	x	x	x				x									
01	2. ELF-2	4/7/2022	13:30	W		4	x	x	x	x	x	x	x	x				x									
—	3. ELF-3			W		4	x	x	x	x	x	x	x	x				x									
02	4. ELF-4	4/7/2022	11:30	W		4	x	x	x	x	x	x	x	x				x									
03	5. ELF-5R	4/6/2022	17:50	W		4	x	x	x	x	x	x	x	x				x									
04	6. ELF-6R	4/6/2022	17:10	W		4	x	x	x	x	x	x	x	x				x									
05	7. ELF-7	4/6/2022	20:00	W		4	x	x	x	x	x	x	x	x				x									
06	8. ELF-8	4/7/2022	10:50	W		4	x	x	x	x	x	x	x	x				x									
07	9. ELF-9	4/7/2022	12:35	W		4	x	x	x	x	x	x	x	x				x									
—	10. ELF-10			W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 0.6

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
[signature]	4-8-22 12:37	Denise Brw	4/8/22 12:37
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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 agress to pay collection costs and attorney's fees.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

2200656

2 of 2

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																	Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
08	1. ELF-11	4/7/2022	10:05	W		4	x	x	x	x	x	x	x	x				x								
09	2. ELF-12	4/6/2022	18:45	W		4	x	x	x	x	x	x	x	x				x								
10	3. ELF-13	4/6/2022	16:25	W		4	x	x	x	x	x	x	x	x				x								
11	4. ELF-14	4/6/2022	12:40	W		4	x	x	x	x	x	x	x	x				x								
12	5. ELF-15	4/6/2022	15.:35	W		4	x	x	x	x	x	x	x	x				x								
13	6. ELF-16	4/6/2022	13:30	W		4	x	x	x	x	x	x	x	x				x								
	7. ELF-17			W		4	x	x	x	x	x	x	x	x				x								
	8.																									
14	9. Duplicate - (CCR)	4/6/2022	17:50	W		4	x	x	x	x	x	x	x	x				x								
15	10. Field Blank - (CCR)	4/7/2022	12:35	W		4	x	x	x	x	x	x	x	x				x								

Sampled by: Bradley Giles & Dennis Vanderbeek Sampled by: [signature] Bradley Giles

ON ICE NOT ON ICE Temp (C°): 0.6

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
[signature]	4-8-22 12:37	[signature]	4-8-22 12:37
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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 agress to pay collection costs and attorney's fees.

Work Order # 22D06656

CHEMTECH FORD LABORATORIES
Sample Receipt

CHEMTECH-FORD LABORATORIES

Delivery Method:

- ☐ UPS
- ☐ USPS
- ☐ FedEx
- ☐ Chemtech Courier
- ☑ Walk-in
- ☐ Customer Courier

Receiving Temperature 0.6 °C

Sample #	Container	Chemtech Lot # or Preservative	Number of Subsamples	Preserved by Client/Third Party	Preserved in Receiving/Laboratory	Filtered in Field by Client	Misc Volume (oz/mL)	Comments
01-15	AG(2)	1183						

Sample Condition
(check if *yes*)

- ☐ Custody Seals
- ☑ Containers Intact
- ☑ COC can be matched to bottles
- ☑ Received on Ice
- ☑ Correct Containers(s)
- ☑ Sufficent Sample Volume
- ☐ Headspace Present (VOC)
- ☐ Temperature Blank
- ☑ Received within Holding Time

Plastic Containers

- A- Plastic Unpreserved
- B- Miscellaneous Plastic
- C- Cyanide Qt (NaOH)
- E- Coliform/Ecoli/HPC
- F- Sulfide Qt (Zn Acetate)
- L- Mercury 1631
- M- Metals Pint (HNO3)
- N- Nutrient Pint (H2SO4)
- R- Radiological (HNO3)
- S- Sludge Cups/Tubs
- Q- Plastic Bag

Glass Containers

- D- 625 ($Na_2S_2O_3$)
- G- Glass Unpreserved
- H- HAAs (NH_4Cl)
- J- 508/515/525 (Na_2SO_3)
- K- 515.3 Herbicides
- O- Oil & Grease (HCl)
- P- Phenols (H_2SO_4)
- T- TOC/TOX (H_3PO_4)
- U- 531 (MCAA, $Na_2S_2O_3$)
- V- 524/THMs (Ascorbic Acid)
- W- 8260 VOC (1:1 HCl)
- X- Vial Unpreserved
- Y- 624/504 ($Na_2S_2O_3$)
- Z- Miscellaneous Glass

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF

QC Sample ID: Batch:

Date Prepared: Date Analyzed:

Monday, May 23, 2022

Mark Broadhead
Chemtech-Ford, Inc.
9632 South 500 West
Sandy, UT 84070

Re: ALS Workorder: 2204295
Project Name:
Project Number: 22D0656

Dear Mr. Broadhead:

Fifteen water samples were received from Chemtech-Ford, Inc., on 4/18/2022. The samples were scheduled for the following analyses:

Radium-226
Radium-228

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

For

ALS Environmental
Katie M. OBrien
Project Manager

Accreditations: ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Arizona	AZ0828
California (CA)	2926
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
Oklahoma	1301
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO010992018-1
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	TN02976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280
Virginia	460305

40 CFR Part 136: All analyses for Clean Water Act samples are analyzed using the 40 CFR Part 136 specified method and include all the QC requirements.

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

22D0656

2204295

SENDING LABORATORY:

Chemtech-Ford Laboratories
9632 South 500 West
Sandy, UT 84070
Phone: 801.262.7299
Fax: 866.792.0093
Project Manager: Mark Broadhead

RECEIVING LABORATORY:

ALS Laboratories, Ft. Collins
225 Commerce Drive
Ft. Collins, CO 80524
Phone :(800) 443-1511
Fax: (970) 490-1522

QC 2+
MS/MSD on sample #1

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 22D0656-01	**Water**	**Sampled:04/07/2022 13:30**		
Radium-228	04/21/2022 15:00	10/04/2022 13:30		
Radium-226	04/21/2022 15:00	10/04/2022 13:30		
Containers Supplied:				
Sample ID: 22D0656-02	**Water**	**Sampled:04/07/2022 11:30**		
Radium-226	04/21/2022 15:00	10/04/2022 11:30		
Radium-228	04/21/2022 15:00	10/04/2022 11:30		
Containers Supplied:				
Sample ID: 22D0656-03	**Water**	**Sampled:04/06/2022 17:50**		
Radium-226	04/21/2022 15:00	10/03/2022 17:50		
Radium-228	04/21/2022 15:00	10/03/2022 17:50		
Containers Supplied:				
Sample ID: 22D0656-04	**Water**	**Sampled:04/06/2022 17:10**		
Radium-226	04/21/2022 15:00	10/03/2022 17:10		
Radium-228	04/21/2022 15:00	10/03/2022 17:10		
Containers Supplied:				
Sample ID: 22D0656-05	**Water**	**Sampled:04/06/2022 20:00**		
Radium-226	04/21/2022 15:00	10/03/2022 20:00		
Radium-228	04/21/2022 15:00	10/03/2022 20:00		
Containers Supplied:				

Released By	Date	Received By	Date
[signature]	4/8/22	Karen Craven	4/8/22 0944
Released By	Date	Received By	Date

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

22D0656

2204295

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 22D0656-06	**Water**	**Sampled:04/07/2022 10:50**		
Radium-226	04/21/2022 15:00	10/04/2022 10:50		
Radium-228	04/21/2022 15:00	10/04/2022 10:50		
Containers Supplied:				
Sample ID: 22D0656-07	**Water**	**Sampled:04/07/2022 12:35**		
Radium-228	04/21/2022 15:00	10/04/2022 12:35		
Radium-226	04/21/2022 15:00	10/04/2022 12:35		
Containers Supplied:				
Sample ID: 22D0656-08	**Water**	**Sampled:04/07/2022 10:05**		
Radium-228	04/21/2022 15:00	10/04/2022 10:05		
Radium-226	04/21/2022 15:00	10/04/2022 10:05		
Containers Supplied:				
Sample ID: 22D0656-09	**Water**	**Sampled:04/06/2022 18:45**		
Radium-226	04/21/2022 15:00	10/03/2022 18:45		
Radium-228	04/21/2022 15:00	10/03/2022 18:45		
Containers Supplied:				
Sample ID: 22D0656-10	**Water**	**Sampled:04/06/2022 16:25**		
Radium-226	04/21/2022 15:00	10/03/2022 16:25		
Radium-228	04/21/2022 15:00	10/03/2022 16:25		
Containers Supplied:				
Sample ID: 22D0656-11	**Water**	**Sampled:04/06/2022 12:40**		
Radium-226	04/21/2022 15:00	10/03/2022 12:40		
Radium-228	04/21/2022 15:00	10/03/2022 12:40		
Containers Supplied:				

Released By	Date	Received By	Date
[signature]	4/8/22	Karen Craven	4-18-22 0844
Released By	Date	Received By	Date

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

22D0656

2204295

Analysis	Due	Expires	Laboratory ID	Comments
Sample ID: 22D0656-12	**Water**	**Sampled:04/06/2022 15:35**		
Radium-226	04/21/2022 15:00	10/03/2022 15:35		
Radium-228	04/21/2022 15:00	10/03/2022 15:35		
Containers Supplied:				
Sample ID: 22D0656-13	**Water**	**Sampled:04/06/2022 13:30**		
Radium-226	04/21/2022 15:00	10/03/2022 13:30		
Radium-228	04/21/2022 15:00	10/03/2022 13:30		
Containers Supplied:				
Sample ID: 22D0656-14	**Water**	**Sampled:04/06/2022 17:50**		
Radium-226	04/21/2022 15:00	10/03/2022 17:50		
Radium-228	04/21/2022 15:00	10/03/2022 17:50		
Containers Supplied:				
Sample ID: 22D0656-15	**Water**	**Sampled:04/07/2022 12:35**		
Radium-228	04/21/2022 15:00	10/04/2022 12:35		
Radium-226	04/21/2022 15:00	10/04/2022 12:35		
Containers Supplied:				

[signature]	4/8/22	Karen Craven	4-18-22 0844
eleased By	Date	Received By	Date
eleased By	Date	Received By	Date

ALS Environmental - Fort Colllins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHEMTECH Workorder No: 2204295

Project Manager: KMO Initials: KC Date: 4/18/22

	N/A	YES	NO
1. Are airbills / shipping documents present and/or removable?		X	
Tracking number:			
2. Are custody seals on shipping containers intact?	X		
3. Are custody seals on sample containers intact?	X		
4. Is there a COC (chain-of-custody) present?		X	
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)			X
6. Are short-hold samples present?			X
7. Are all samples within holding times for the requested analyses?		X	
8. Were all sample containers received intact? (not broken or leaking)		X	
9. Is there sufficient sample for the requested analyses?		X	
10. Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	X		
13. Were the samples shipped on ice?			X
14. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		

Cooler #:	1	2					
Temperature (°C):	18.6	18.8					
# of custody seals on cooler:	0	0					
External µR/hr reading:	11	10					
Background µR/hr reading:	10						

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES

* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Missing a cooler. Samples 22D0656-06 through -10 have not been received.

Per Zoe, client will resample these, please proceed with the rest 4/25/22

Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: KC

If applicable, was the client contacted?

Project Manager Signature / Date

Form 201r29.xls
(10/15/2019)

* IR Gun #3, VWR SN 170647571
* IR Gun #5, VWR SN 192272629

2204295

...E & FEES PAID
...RITY MAIL RATE
...URCHARGE

062S0011692451
10579755
FROM 84070

stamps
endicia
04/11/2022

PRIRITY MAIL 3-DAY™

0004

Chemtech-Ford Laboratories
Reed Hendricks
9632 S 500 W
Sandy UT 84070

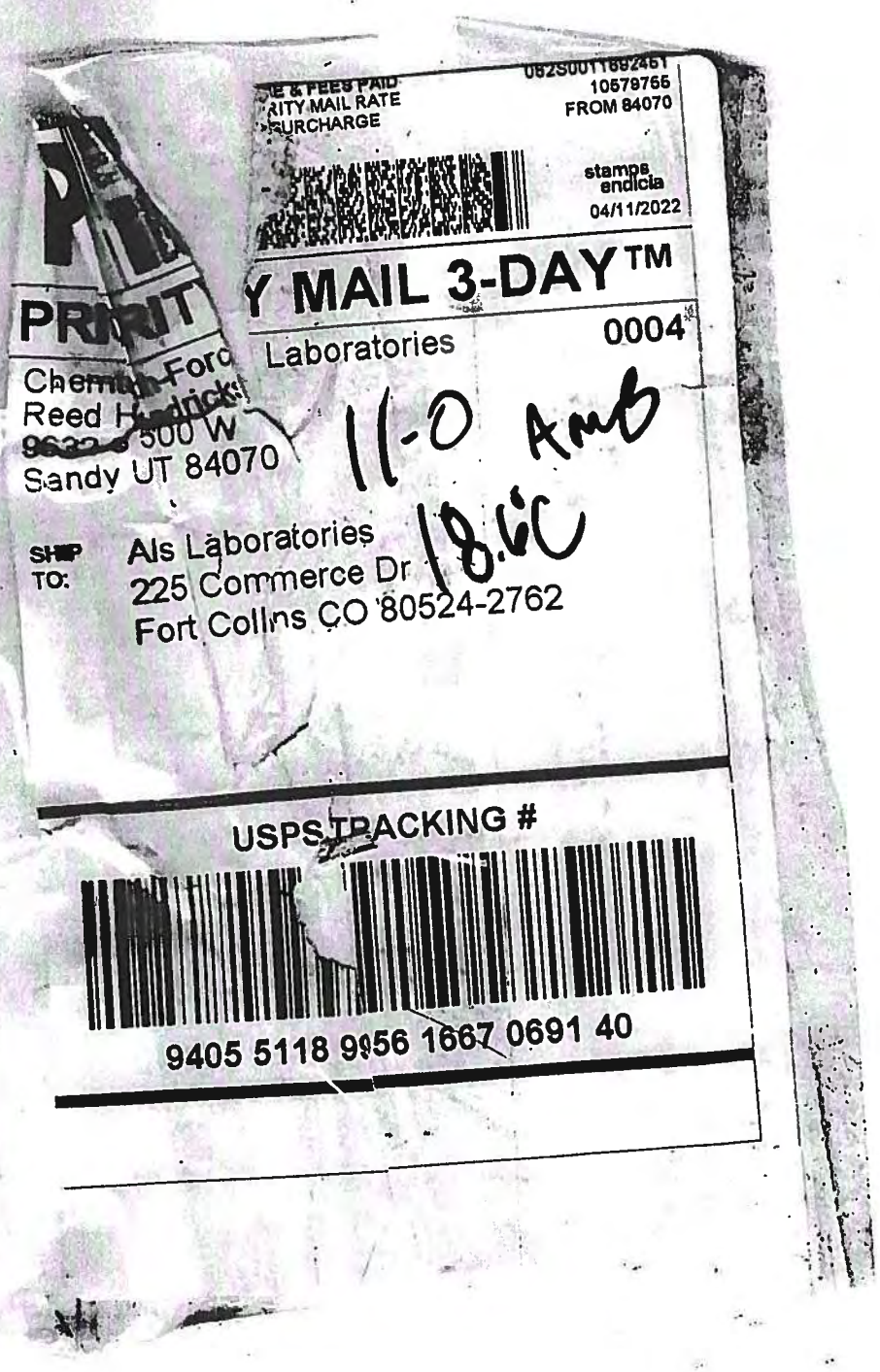
11-0 AMB

SHIP TO: Als Laboratories
225 Commerce Dr
Fort Collins CO 80524-2762

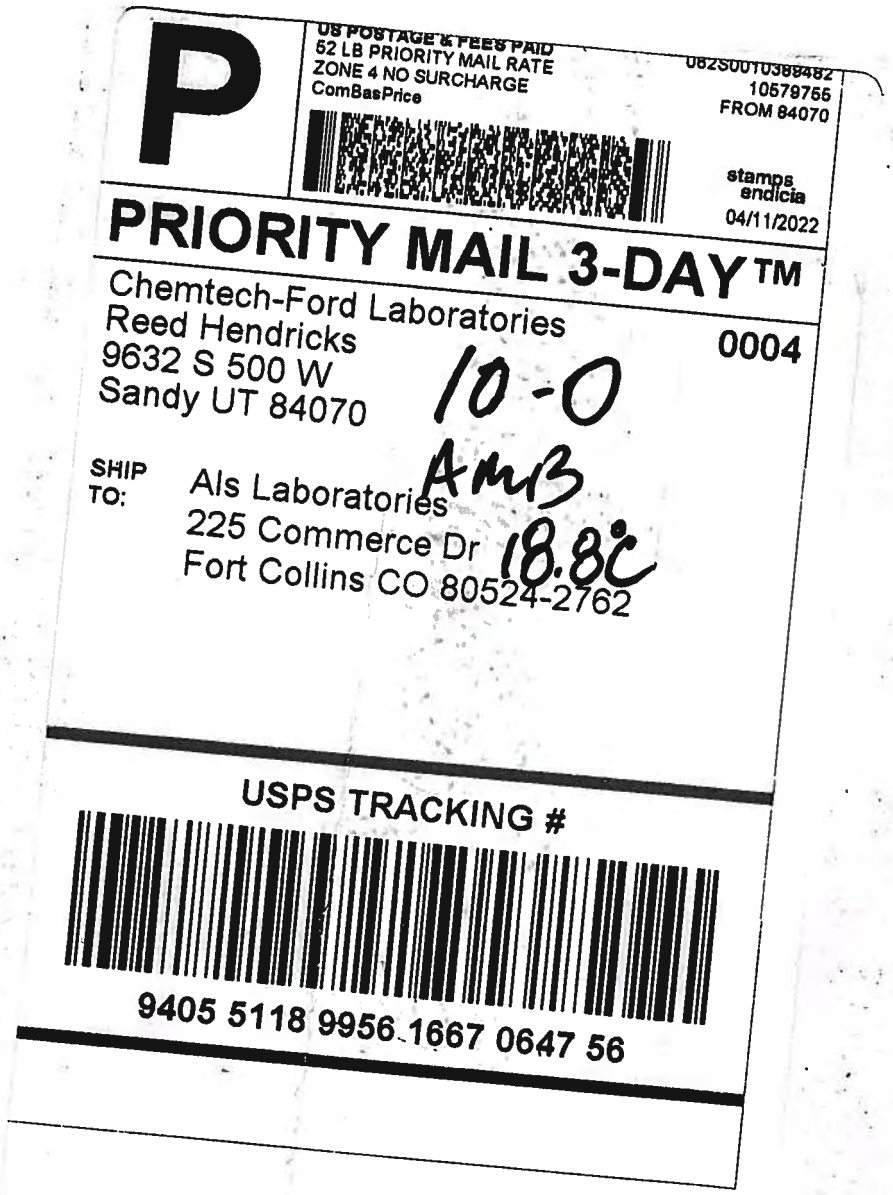
18.6°C

USPS TRACKING #

9405 5118 9956 1667 0691 40



220295



P

US POSTAGE & FEES PAID
52 LB PRIORITY MAIL RATE
ZONE 4 NO SURCHARGE
ComBasPrice

062S0010388482
10579755
FROM 84070

stamps endicia
04/11/2022

PRIORITY MAIL 3-DAY™

Chemtech-Ford Laboratories
Reed Hendricks
9632 S 500 W
Sandy UT 84070

0004

10-0
AMB
18.8°C

SHIP TO:
Als Laboratories
225 Commerce Dr
Fort Collins CO 80524-2762

USPS TRACKING #

9405 5118 9956 1667 0647 56

Radium-226

Case Narrative

Chemtech-Ford, Inc.

22E0292

Work Order Number: 2205240

1. This report consists of the analytical results and supporting documentation for one water sample received by ALS on 5/12/2022.

2. This sample was prepared and analyzed according to the current revisions of SOP 783 and SOP 736. The analyses were completed on 5/26/2022.

3. The analysis results for these samples are reported in units of pCi/L. The sample was not filtered prior to analysis.

4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.

5. ICP-AES measurement of barium concentrations prior to chemical separation for the LCSD showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero.

6. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.

7. No further anomalous situations were encountered during the preparation or analysis of this sample. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Dakota Wylde — 6/1/22

Dakota Wylde
Date
Radiochemistry Primary Data Reviewer

Radiochemistry Final Data Reviewer
Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2205240
Client Name: Chemtech-Ford, Inc.
Client Project Name:
Client Project Number: 22E0292
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
22E0292-01	2205240-1		WATER	02-May-22	10:00

CHEMTECH-FORD LABORATORIES

2205240

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0292

SENDING LABORATORY:

Chemtech-Ford Laboratories
9632 South 500 West
Sandy, UT 84070
Phone: 801.262.7299
Fax: 866.792.0093

RECEIVING LABORATORY:

ALS Laboratories, Ft. Collins
225 Commerce Drive
Ft. Collins, CO 80524
Phone: (800) 443-1511
Fax: (970) 490-1522

Work Order Comments:

Laboratory ID: 22E0292-01 **Matrix:** Water

Requested Test	Suggested Analytical Method *	Sampled: 05/02/2022 10:00
Radium-228 Variance	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228	EPA 904.0	
Radium-226 Variance	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226	EPA 903.1	

Released By	Date	Received By	Date
Denise Brew	5/4/22	Allison Thomas	5/12/22 1225
Released By	Date	Received By	Date

** NOTE - If you are not certified for our suggested analytical method, please use your certified method.*

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHEMTECH Workorder No: 2205240

Project Manager: KMO Initials: CXT Date: 5/12/2022

		N/A	YES	NO
1.	Are airbills / shipping documents present and/or removable?		X	
	Tracking number: 7768 2066 0834/ 7768 2069 5791			
2.	Are custody seals on shipping containers intact?	X		
3.	Are custody seals on sample containers intact?	X		
4.	Is there a COC (chain-of-custody) present?		X	
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6.	Are short-hold samples present?			X
7.	Are all samples within holding times for the requested analyses?		X	
8.	Were all sample containers received intact? (not broken or leaking)		X	
9.	Is there sufficient sample for the requested analyses?		X	
10.	Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	X		
13.	Were the samples shipped on ice?			X
14.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		X

Cooler #:	1	2					
Temperature (°C):	AMB	AMB					
# of custody seals on cooler:	0	0					
External µR/hr reading:	11	10					
Background µR/hr reading:	11						

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES

* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: CT

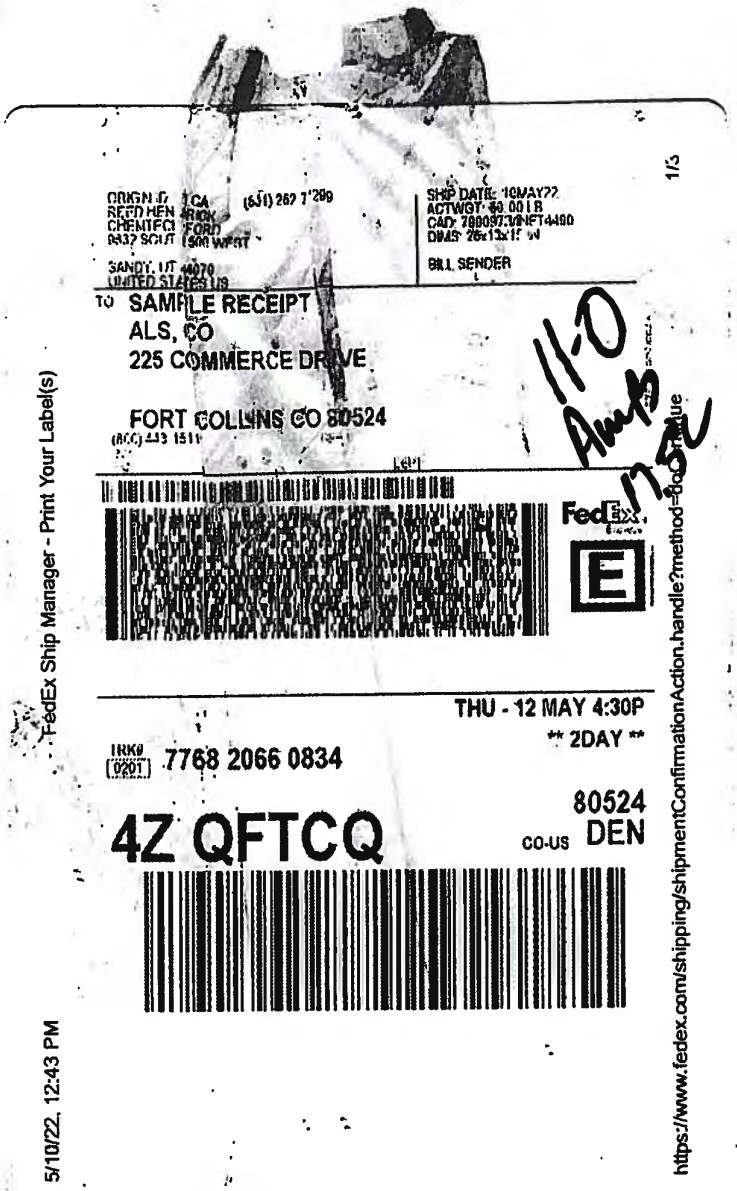
If applicable, was the client contacted? YES / N

Project Manager Signature / Date:

Form 201r29.xls
(10/15/2019)

* IR Gun #3, VWR SN 170647571
* IR Gun #5, VWR SN 192272629

2205240



ORIGIN ID: 1CA (631) 262 7299
REED HENRICK
CHEMTECH FORD
9832 SOUTH 500 WEST
SANDY, UT 84070
UNITED STATES US

SHIP DATE: 10MAY22
ACTWGT: 60.00 LB
CAD: 7800973/INET4490
DIMS: 26x13x15 IN
BILL SENDER

TO SAMPLE RECEIPT
ALS, CO
225 COMMERCE DRIVE

FORT COLLINS CO 80524
(800) 443 1511

11-0
Amp
17-32

FedEx
E

THU - 12 MAY 4:30P
** 2DAY **

TRK# 0201 7768 2066 0834

80524
CO-US DEN

4Z QFTCQ

FedEx Ship Manager - Print Your Label(s)

5/10/22, 12:43 PM

https://www.fedex.com/shipping/shipmentConfirmationAction.handle?method=doc...

1/3

2205240

ORIGIN ID:SLCA (801) 262-7299
REED HENDRICK
CHEMTECH FORD
9632 SOUTH 500 WEST
SANDY, UT 84070
UNITED STATES US

SHIP DATE: 10MAY22
ACTWGT: 52.00 LB
CAD: 7880073/INET4400
DIMS: 26x13x14 IN
BILL SENDER

1/3

TO SAMPLE RECEIPT
ALS, CO
225 COMMERCE DRIVE
FORT COLLINS CO 80524
(800) 443-1511

10-0
Amb
183C

FedEx Ship Manager - Print Your Label(s)

FedEx
E

THU - 12 MAY 4:30P
** 2DAY **

TRK# 0201 7768 2069 5791

4Z QFTCQ

80524
CO-US DEN

5/10/22, 12:45 PM

https://www.fedex.com/shipping/shipmentConfirmationAction.handle?method=doContinue

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Method Blank Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Lab ID: RE220518-2MB

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 18-May-22
Date Prepared: 18-May-22
Date Analyzed: 26-May-22

Prep Batch: RE220518-2
QCBatchID: RE220518-2-1
Run ID: RE220518-2A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	-0.02 +/- 0.12	0.26	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15180	14900	ug	98.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: *RE2205240-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Lab ID: RE220518-2LCS

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 18-May-22
Date Prepared: 18-May-22
Date Analyzed: 26-May-22

Prep Batch: RE220518-2
QCBatchID: RE220518-2-1
Run ID: RE220518-2A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	42 +/- 10	0	46.77	88.9	67 - 120	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15200	15090	ug	99.3	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE2205240-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Lab ID: RE220518-2LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 18-May-22
Date Prepared: 18-May-22
Date Analyzed: 26-May-22

Prep Batch: RE220518-2
QCBatchID: RE220518-2-1
Run ID: RE220518-2A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	45 +/- 11	0	46.77	97.2	67 - 120	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15180	14310	ug	94.3	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE2205240-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Field ID:
Lab ID: RE220518-2LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 18-May-22
Date Prepared: 18-May-22
Date Analyzed: 26-May-22

Prep Batch: RE220518-2
QCBatchID: RE220518-2-1
Run ID: RE220518-2A
Count Time: 15 minutes

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13982-63-3	Ra-226	42 +/- 10	0	P	45 +/- 11	0	P	0.25	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *RE2205240-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Field ID: 22E0292-01
Lab ID: 2205240-1

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 02-May-22
Date Prepared: 18-May-22
Date Analyzed: 26-May-22

Prep Batch: RE220518-2
QCBatchID: RE220518-2-1
Run ID: RE220518-2A
Count Time: 15 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.08 +/- 0.34	0.64	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15200	14620	ug	96.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RE2205240-1*

Radium-228

Case Narrative

Chemtech-Ford, Inc.

22E0292

Work Order Number: 2205240

1. This report consists of the analytical results for one water sample received by ALS on 5/12/2022.

2. This sample was prepared according to the current revision of SOP 749.

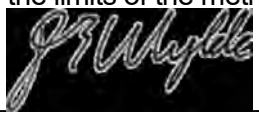
3. The sample was analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac, which is the ingrown progeny of ^{228}Ra, according to the current revision of SOP 724. The analyses were completed on 6/2/2022.

4. The analysis results for this sample are reported in units of pCi/L. The sample was not filtered prior to analysis.

5. ICP-AES measurement of barium concentrations prior to chemical separation for the method blank showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero.

6. No further anomalous situations were noted during the preparation and analysis of this sample. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.



6/3/22

Dakota Wylde
Radiochemistry Primary Data Reviewer

Date

Radiochemistry Final Data Reviewer

Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2205240
Client Name: Chemtech-Ford, Inc.
Client Project Name:
Client Project Number: 22E0292
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
22E0292-01	2205240-1		WATER	02-May-22	10:00

CHEMTECH-FORD LABORATORIES

2205240

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0292

SENDING LABORATORY:

Chemtech-Ford Laboratories
9632 South 500 West
Sandy, UT 84070
Phone: 801.262.7299
Fax: 866.792.0093

RECEIVING LABORATORY:

ALS Laboratories, Ft. Collins
225 Commerce Drive
Ft. Collins, CO 80524
Phone: (800) 443-1511
Fax: (970) 490-1522

Work Order Comments:

Laboratory ID: 22E0292-01 **Matrix:** Water

Requested Test	Suggested Analytical Method *	Sampled: 05/02/2022 10:00
Radium-228 Variance	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228	EPA 904.0	
Radium-226 Variance	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226	EPA 903.1	

Released By	Date	Received By	Date
Denise Brew	5/4/22	Allison Thomas	5/12/22 1225
Released By	Date	Received By	Date

** NOTE - If you are not certified for our suggested analytical method, please use your certified method.*

ALS Environmental - Fort Colllins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHEMTECH Workorder No: 2205240

Project Manager: KMO Initials: CXT Date: 5/12/2022

	N/A	YES	NO
1. Are airbills / shipping documents present and/or removable?		X	
Tracking number: 7768 2066 0834/ 7768 2069 5791			
2. Are custody seals on shipping containers intact?	X		
3. Are custody seals on sample containers intact?	X		
4. Is there a COC (chain-of-custody) present?		X	
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6. Are short-hold samples present?			X
7. Are all samples within holding times for the requested analyses?		X	
8. Were all sample containers received intact? (not broken or leaking)		X	
9. Is there sufficient sample for the requested analyses?		X	
10. Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	X		
13. Were the samples shipped on ice?			X
14. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		X

Cooler #:	1	2					
Temperature (°C):	AMB	AMB					
# of custody seals on cooler:	0	0					
External µR/hr reading:	11	10					
Background µR/hr reading:	11						

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES

* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: CT

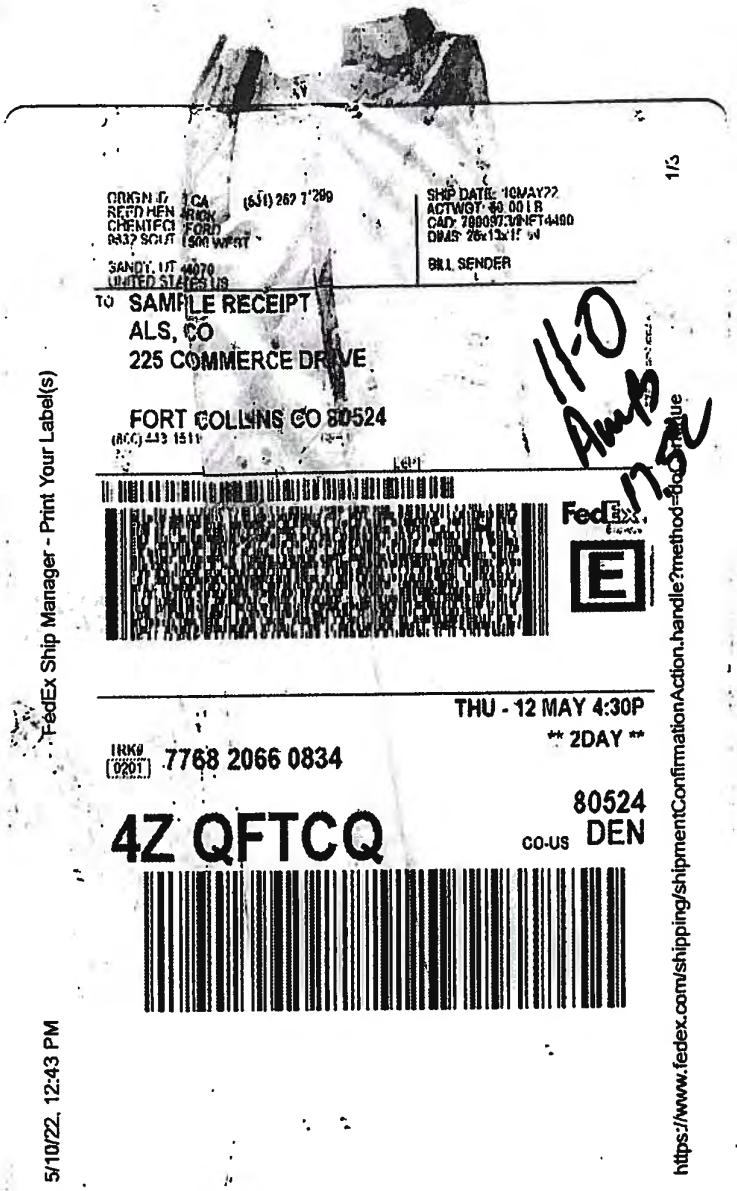
If applicable, was the client contacted? YES / N

Project Manager Signature / Date:

Form 201r29.xls
(10/15/2019)

* IR Gun #3, VWR SN 170647571
* IR Gun #5, VWR SN 192272629

2205240



ORIGIN ID: 1CA (631) 262 7299
REED HEN ARICK
CHEMTECH FORD
9832 SOUTH 500 WEST
SANDY, UT 84070
UNITED STATES US

SHIP DATE: 10MAY22
ACTWGT: 60.00 LB
CAD: 7800973/INET4490
DIMS: 26x13x15 IN
BILL SENDER

1/3

TO SAMPLE RECEIPT
ALS, CO
225 COMMERCE DRIVE

FORT COLLINS CO 80524
(800) 443 1511

11-0
Amp
17-32

FedEx
E

THU - 12 MAY 4:30P
** 2DAY **

TRK# 0201 7768 2066 0834

80524
CO-US DEN

4Z QFTCQ

FedEx Ship Manager - Print Your Label(s)

5/10/22, 12:43 PM

https://www.fedex.com/shipping/shipmentConfirmationAction.handle?method=doc...

2205240

ETP 11952

ORIGIN ID: SLCA (801) 262-7299
REED HENDRICK
CHEMTECH FORD
9632 SOUTH 500 WEST
SANDY, UT 84070
UNITED STATES US

SHIP DATE: 10MAY22
ACTWGT: 52.00 LB
CAD: 7800073/INFT4400
DIMS: 26x13x14 IN
BILL SENDER

1/3

TO: SAMPLE RECEIPT
ALS, CO
225 COMMERCE DRIVE

FORT COLLINS CO 80524
(800) 443-1511

10-0
AMB
183°C

FedEx Ship Manager - Print Your Label(s)

FedEx

E

THU - 12 MAY 4:30P
** 2DAY **

TRK# 0201 7768 2069 5791

4Z QFTCQ

80524
CO-US DEN

5/10/22, 12:45 PM

https://www.fedex.com/shipping/shipmentConfirmationAction.handle?method=doContinue

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Method Blank Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Lab ID: RA220527-1MB

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes

Final Aliquot: 997 ml
Result Units: pCi/l
File Name: RAA0602A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	0.01 +/- 0.40	0.90	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32130	30570	ug	95.1	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: *RA2205240-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Lab ID: RA220527-1LCS

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes

Final Aliquot: 997 ml
Result Units: pCi/l
File Name: RAA0602A

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	25.8 +/- 6.0	0.9	21.54	120	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32140	29640	ug	92.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RA2205240-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205240
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0292

Field ID: 22E0292-01
Lab ID: 2205240-1

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 02-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: RAA0602A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	-0.05 +/- 0.41	0.93	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32160	29580	ug	92.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RA2205240-1*

6/16/2022

Work Order: 22E0465
Project: [none]

Pacificorp Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

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:

Patrick Noteboom, Project Manager

Pacificorp Environmental Remediation
Brad Giles

REPORT NARRATIVE

Sample Group

Laboratory ID	Sample Name
22E0465-01	ELF-8
22E0465-02	ELF-9
22E0465-03	ELF-11
22E0465-04	ELF-12
22E0465-05	ELF-13

These samples are replacement samples for those lost in transit from Chemtech-Ford Laboratory ID: 22D0656

Chemtech-Ford Laboratories
Serving the Intermountain West Since 1953

9632 South 500 West
Sandy, UT 84070
O:(801) 262-7299 F: (866) 792-0093
www.ChemtechFord.com

Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **5/5/22 15:40 @ 1.1** °C
Date Reported: 6/16/2022
Project Name: **[none]**

Sample ID: **ELF-8**

Matrix: **Water**
Lab ID: **22E0465-01**
Date Sampled: **5/4/22 16:20**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Combined Radium 226+228	0.93	pCi/L	1.2	varies	6/6/22	6/6/22	
Radium-226	0.69	pCi/L	0.34	EPA 903.1	6/6/22	6/6/22	SL-20
Radium-228	0.24	pCi/L	0.85	EPA 904.0	6/2/22	6/2/22	SL-20

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Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **5/5/22 15:40 @ 1.1** °C
Date Reported: 6/16/2022
Project Name: **[none]**

Sample ID: **ELF-9**

Matrix: **Water**
Lab ID: **22E0465-02**
Date Sampled: **5/5/22 11:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Combined Radium 226+228	1.8	pCi/L	1.3	varies	6/6/22	6/6/22	
Radium-226	0.33	pCi/L	0.39	EPA 903.1	6/6/22	6/6/22	SL-20
Radium-228	1.4	pCi/L	0.95	EPA 904.0	6/2/22	6/2/22	SL-20

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Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **5/5/22 15:40 @ 1.1** °C
Date Reported: 6/16/2022
Project Name: **[none]**

Sample ID: **ELF-11**

Matrix: **Water**
Lab ID: **22E0465-03**
Date Sampled: **5/4/22 17:05**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Combined Radium 226+228	2.3	pCi/L	1.2	varies	6/6/22	6/6/22	
Radium-226	0.15	pCi/L	0.28	EPA 903.1	6/6/22	6/6/22	SL-20
Radium-228	2.2	pCi/L	0.87	EPA 904.0	6/2/22	6/2/22	SL-20

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Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **5/5/22 15:40 @ 1.1** °C
Date Reported: 6/16/2022
Project Name: **[none]**

Sample ID: **ELF-12**

Matrix: **Water**
Lab ID: **22E0465-04**
Date Sampled: **5/4/22 18:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Combined Radium 226+228	3.1	pCi/L	1.2	varies	6/6/22	6/6/22	
Radium-226	0.19	pCi/L	0.36	EPA 903.1	6/6/22	6/6/22	SL-20
Radium-228	2.9	pCi/L	0.87	EPA 904.0	6/2/22	6/2/22	SL-20

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Sandy, UT 84070
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www.ChemtechFord.com

Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **5/5/22 15:40 @ 1.1** °C
Date Reported: 6/16/2022
Project Name: **[none]**

Sample ID: **ELF-13**

Matrix: **Water**
Lab ID: **22E0465-05**
Date Sampled: **5/5/22 10:10**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Combined Radium 226+228	2.1	pCi/L	1.2	varies	6/6/22	6/6/22	
Radium-226	0.54	pCi/L	0.36	EPA 903.1	6/6/22	6/6/22	SL-20
Radium-228	1.6	pCi/L	0.87	EPA 904.0	6/2/22	6/2/22	SL-20

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Sandy, UT 84070
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www.ChemtechFord.com

Certificate of Analysis

Pacificorp Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **5/5/22 15:40** @ **1.1** °C
Date Reported: 6/16/2022
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.

Flag Descriptions

SL-20 = Analysis performed by ALS Fort Collins, 225 Commerce Dr., Fort Collins, CO 80524.

CHAIN OF CUSTODY

CHEMTECH - FORD ANALYTICAL LABORATORY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

22E0465

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																				Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228 (separate & combined)						Total Colliform + E. coli (Present/Absent)	Total Colliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
-01	1. ELF-8	5/4/2022	16:20	W		2												x										
-02	2. ELF-9	5/5/2022	11:00	W		2												x										
-03	3. ELF-11	5/4/2022	17:05	W		2												x										
-04	4. ELF-12	5/4/2022	18:10	W		2												x										
-05	5. ELF-13	5/5/2022	10:10	W		2												x										
	6.																											
	7.																											
	8.																											
	9.																											
	10.																											

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 1.1

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

Special Instructions:

Relinquished by: [signature]	Date/Time 5-5-22 15:40	Received by: [signature]	Date/Time 5/5/22 1540
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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 agress to pay collection costs and attorney's fees.

Work Order # 22F0465

CHEMTECH FORD LABORATORIES
Sample Receipt

CHEMTECH-FORD LABORATORIES

Delivery Method:

- ☐ UPS
- ☐ USPS
- ☐ FedEx
- ☐ Chemtech Courier
- ☑ Walk-in
- ☐ Customer Courier

Receiving Temperature 1.1 °C

Sample #	Container	Chemtech Lot # or Preservative	Number of Subsamples	Preserved by Client/Third Party	Preserved in Receiving/Laboratory	Filtered in Field by Client	Misc Volume (oz/mL)	Comments
01-05	Ag(2)	1183						

Sample Condition
(check if *yes*)

- ☐ Custody Seals
- ☑ Containers Intact
- ☑ COC can be matched to bottles
- ☑ Received on Ice
- ☑ Correct Containers(s)
- ☑ Sufficent Sample Volume
- ☐ Headspace Present (VOC)
- ☐ Temperature Blank
- ☑ Received within Holding Time

Plastic Containers

A- Plastic Unpreserved
B- Miscellaneous Plastic
C- Cyanide Qt (NaOH)
E- Coliform/Ecoli/HPC
F- Sulfide Qt (Zn Acetate)
L- Mercury 1631
M- Metals Pint (HNO3)
N- Nutrient Pint (H2SO4)
R- Radiological (HNO3)
S- Sludge Cups/Tubs
Q- Plastic Bag

Glass Containers

D- 625 (Na2S2O3)
G- Glass Unpreserved
H- HAAs (NH4Cl)
J- 508/515/525 (Na2SO3)
K- 515.3 Herbicides
O- Oil & Grease (HCl)
P- Phenols (H2SO4)
T- TOC/TOX (H3PO4)
U- 531 (MCAA, Na2S2O3)
V- 524/THMs (Ascorbic Acid)
W- 8260 VOC (1:1 HCl)
X- Vial Unpreserved
Y- 624/504 (Na2S2O3)
Z- Miscellaneous Glass

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF

QC Sample ID: Batch:

Date Prepared: Date Analyzed:

Monday, June 13, 2022

Mark Broadhead
Chemtech-Ford, Inc.
9632 South 500 West
Sandy, UT 84070

Re: ALS Workorder: 2205214
Project Name:
Project Number: 22E0465

Dear Mr. Broadhead:

Five water samples were received from Chemtech-Ford, Inc., on 5/11/2022. The samples were scheduled for the following analyses:

Radium-226	pages 1-16
Radium-228	pages 1-14

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. OBrien
Project Manager

Accreditations: ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
Arizona	AZ0828
California (CA)	2926
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
Oklahoma	1301
Louisiana	197538
Maryland (MD)	285
PJLA (DoD ELAP/ISO 170250)	95377
PJLA (DOE-AP/ISO 17025)	95377
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO010992018-1
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	TN02976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280
Virginia	460305

40 CFR Part 136: All analyses for Clean Water Act samples are analyzed using the 40 CFR Part 136 specified method and include all the QC requirements.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2205214
Client Name: Chemtech-Ford, Inc.
Client Project Name:
Client Project Number: 22E0465
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
22E0465-01	2205214-1		WATER	04-May-22	16:20
22E0465-02	2205214-2		WATER	05-May-22	11:00
22E0465-03	2205214-3		WATER	04-May-22	17:05
22E0465-04	2205214-4		WATER	04-May-22	18:10
22E0465-05	2205214-5		WATER	05-May-22	10:10

CHEMTECH-FORD LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0465

2205214

SENDING LABORATORY:

Chemtech-Ford Laboratories
9632 South 500 West
Sandy, UT 84070
Phone: 801.262.7299
Fax: 866.792.0093

RECEIVING LABORATORY:

ALS Laboratories, Ft. Collins
225 Commerce Drive
Ft. Collins, CO 80524
Phone: (800) 443-1511
Fax: (970) 490-1522

Work Order Comments:

Laboratory ID: 22E0465-01		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 16:20
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-226	EPA 903.1	

Laboratory ID: 22E0465-02		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/05/2022 11:00
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22E0465-03		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 17:05
Radium-228	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-226 LLD	EPA 903.1	

Released By	Date	Received By	Date
		[signature]	5/11/22 1521
Released By	Date	Received By	Date

** NOTE - If you are not certified for our suggested analytical method, please use your certified method.*

CHEMTECH-FORD
ABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0465
2205214

Laboratory ID: 22E0465-04		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 18:10
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22E0465-05		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/05/2022 10:10
Radium-228 Variance	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	

Released By Date Received By 5/11/22 1521 Date

Released By Date Received By Date

** NOTE - If you are not certified for our suggested analytical method, please use your certified method.*

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHEMTECH Workorder No: 2205214

Project Manager: KMO Initials: AXK Date: 05/11/2022

		N/A	YES	NO
1.	Are airbills / shipping documents present and/or removable?		X	
	Tracking number:			
2.	Are custody seals on shipping containers intact?	X		
3.	Are custody seals on sample containers intact?	X		
4.	Is there a COC (chain-of-custody) present?		X	
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6.	Are short-hold samples present?			X
7.	Are all samples within holding times for the requested analyses?		X	
8.	Were all sample containers received intact? (not broken or leaking)		X	
9.	Is there sufficient sample for the requested analyses?		X	
10.	Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	X		
13.	Were the samples shipped on ice?	X		
14.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		X

Cooler #:	1							
Temperature (°C):	AMB							
# of custody seals on cooler:	0							
External µR/hr reading:	10							
Background µR/hr reading:	11							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES (If no, see Form 008.)

* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: AK

If applicable, was the client contacted? YES / NO

Project Manager Signature / Date: [redacted]

Form 201r29.xls
(10/15/2019)

* IR Gun #3, VWR SN 170647571
* IR Gun #5, VWR SN 192272629

2205214

1/3
SHIP DATE: 09MAY22
ACTWGT: 52.00 LB
CAD: 7980973/INET4490
DIMS: 26x13x14 IN
BILL SENDER
TO SAMPLE RECEIPT
ALS, CO
225 COMMERCE DRIVE
FORT COLLINS CO 80524
ID-D
Amb
Ship Manager - Print Your Label(s)
WED - 11 MAY 4:30P
** 2DAY **
FedEx
TRK# 7768 0794 0476
0201
80524
CO-US DEN
4Z QFTCQ

Radium-226

Case Narrative

Chemtech-Ford, Inc.

22E0465

Work Order Number: 2205214

1. This report consists of the analytical results and supporting documentation for five water samples received by ALS on 5/11/2022.

2. These samples were prepared and analyzed according to the current revisions of SOP 783 and SOP 736. The analyses were completed on 6/6/2022.

3. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.

4. Sample volume was insufficient to allow preparation of a duplicate. A laboratory control sample duplicate (LCSD) was prepared in lieu of a client sample duplicate.

5. ICP-AES measurement of barium concentrations prior to chemical separation for the laboratory control sample and the LCSD showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero.

6. ALS uses the following convention for reporting significant digits in the TPU and MDC results. The TPU value is rounded to two significant digits. The MDC value is rounded to the same decimal place as the TPU value. In practice, this could result in an MDC reported value of zero for samples with significant activity, including the batch laboratory control sample.

7. No further anomalous situations were encountered during the preparation or analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Dakota Wylde — 6/7/22

Dakota Wylde
Radiochemistry Primary Data Reviewer

Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2205214
Client Name: Chemtech-Ford, Inc.
Client Project Name:
Client Project Number: 22E0465
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
22E0465-01	2205214-1		WATER	04-May-22	16:20
22E0465-02	2205214-2		WATER	05-May-22	11:00
22E0465-03	2205214-3		WATER	04-May-22	17:05
22E0465-04	2205214-4		WATER	04-May-22	18:10
22E0465-05	2205214-5		WATER	05-May-22	10:10

CHEMTECH-FORD LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0465

2205214

SENDING LABORATORY:

Chemtech-Ford Laboratories
9632 South 500 West
Sandy, UT 84070
Phone: 801.262.7299
Fax: 866.792.0093

RECEIVING LABORATORY:

ALS Laboratories, Ft. Collins
225 Commerce Drive
Ft. Collins, CO 80524
Phone: (800) 443-1511
Fax: (970) 490-1522

Work Order Comments:

Laboratory ID: 22E0465-01		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 16:20
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-226	EPA 903.1	

Laboratory ID: 22E0465-02		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/05/2022 11:00
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22E0465-03		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 17:05
Radium-228	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-226 LLD	EPA 903.1	

Released By	Date	Received By	Date
		[signature]	5/11/22 1521
Released By	Date	Received By	Date

** NOTE - If you are not certified for our suggested analytical method, please use your certified method.*

CHEMTECH-FORD
ABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0465
2205214

Laboratory ID: 22E0465-04		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 18:10
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22E0465-05		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/05/2022 10:10
Radium-228 Variance	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	

Released By	Date	Received By	Date
		Amy Leonard	5/11/22 1521
Released By	Date	Received By	Date

* NOTE - If you are not certified for our suggested analytical method, please use your certified method.

ALS Environmental - Fort Colllins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHEMTECH Workorder No: 2205214

Project Manager: KMO Initials: AXK Date: 05/11/2022

		N/A	YES	NO
1.	Are airbills / shipping documents present and/or removable?		X	
	Tracking number:			
2.	Are custody seals on shipping containers intact?	X		
3.	Are custody seals on sample containers intact?	X		
4.	Is there a COC (chain-of-custody) present?		X	
5.	Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6.	Are short-hold samples present?			X
7.	Are all samples within holding times for the requested analyses?		X	
8.	Were all sample containers received intact? (not broken or leaking)		X	
9.	Is there sufficient sample for the requested analyses?		X	
10.	Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11.	Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12.	Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	X		
13.	Were the samples shipped on ice?	X		
14.	Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		X

Cooler #:	1							
Temperature (°C):	AMB							
# of custody seals on cooler:	0							
External µR/hr reading:	10							
Background µR/hr reading:	11							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES (If no, see Form 008.)

* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: AK

If applicable, was the client contacted? YES / NO

Project Manager Signature / Date:

Form 201r29.xls
(10/15/2019)

* IR Gun #3, VWR SN 170647571
* IR Gun #5, VWR SN 192272629

2205214

1/3
SHIP DATE: 09MAY22
ACTWGT: 52.00 LB
CAD: 7980973/NET4480
DIMS: 26x13x14 IN
BILL SENDER
TO SAMPLE RECEIPT
ALS, CO
225 COMMERCE DRIVE
FORT COLLINS CO 80524
ID-D
Amb
Ship Manager - Print Your Label(s)
WED - 11 MAY 4:30P
** 2DAY **
FedEx
TRK# 7768 0794 0476
0201
80524
CO-US DEN
4Z QFTCQ

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Method Blank Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Lab ID: RE220527-1MB

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	-0.05 +/- 0.30	0.64	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15830	14790	ug	93.4	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Lab ID: RE220527-1LCS

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	49 +/- 12	0	46.77	105	67 - 120	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15830	15270	ug	96.5	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Lab ID: RE220527-1LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
13982-63-3	Ra-226	48 +/- 12	0	46.77	103	67 - 120	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15830	15360	ug	97.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Duplicate Sample Results (DER)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID:
Lab ID: RE220527-1LCSD

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Analyte	Sample			Duplicate			DER	DER Lim
		Result +/- 2 s TPU	MDC	Flags	Result +/- 2 s TPU	MDC	Flags		
13982-63-3	Ra-226	49 +/- 12	0	P	48 +/- 12	0	P	0.0407	2.13

Comments:

Duplicate Qualifiers/Flags:

U - Result is less than the sample specific MDC.
Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.
Y2 - Chemical Yield outside default limits.
W - DER is greater than Warning Limit of 1.42
D - DER is greater than Control Limit of 2.13
LT - Result is less than Request MDC, greater than sample specific MDC
M - Requested MDC not met.
M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.
L - LCS Recovery below lower control limit.
H - LCS Recovery above upper control limit.
P - LCS, Matrix Spike Recovery within control limits.
N - Matrix Spike Recovery outside control limits

Abbreviations:

TPU - Total Propagated Uncertainty
DER - Duplicate Error Ratio
BDL - Below Detection Limit
NR - Not Reported

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-01
Lab ID: 2205214-1

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 04-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.69 +/- 0.39	0.34	1	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15840	15340	ug	96.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-02
Lab ID: 2205214-2

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 05-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.33 +/- 0.29	0.39	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15830	14870	ug	93.9	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-03
Lab ID: 2205214-3

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 04-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.15 +/- 0.18	0.28	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15830	14490	ug	91.5	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-04
Lab ID: 2205214-4

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 04-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.19 +/- 0.23	0.36	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15830	15300	ug	96.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RE2205214-1*

Radium-226 by Radon Emanation - Method 903.1

PAI 783 Rev 15

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-05
Lab ID: 2205214-5

Sample Matrix: WATER
Prep SOP: PAI 783 Rev 15
Date Collected: 05-May-22
Date Prepared: 27-May-22
Date Analyzed: 06-Jun-22

Prep Batch: RE220527-1
QCBatchID: RE220527-1-1
Run ID: RE220527-1A
Count Time: 15 minutes
Report Basis: Unfiltered

Final Aliquot: 995 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: Manual Entry

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
13982-63-3	Ra-226	0.54 +/- 0.36	0.36	1	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	15830	15160	ug	95.8	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RE2205214-1*

Radium-228

Case Narrative

Chemtech-Ford, Inc.

22E0465

Work Order Number: 2205214

1. This report consists of the analytical results for five water samples received by ALS on 5/11/2022.

2. These samples were prepared according to the current revision of SOP 749.

3. The samples were analyzed for the presence of ^{228}Ra by low background gas flow proportional counting of ^{228}Ac, which is the ingrown progeny of ^{228}Ra, according to the current revision of SOP 724. The analyses were completed on 6/2/2022.

4. The analysis results for these samples are reported in units of pCi/L. The samples were not filtered prior to analysis.

5. ICP-AES measurement of barium concentrations prior to chemical separation for the method blank showed concentrations less than zero. To avoid a low bias in the final analytical results, the initial barium concentration was taken to be zero.

6. No further anomalous situations were noted during the preparation and analysis of these samples. All remaining quality control criteria were met.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Dakota Wylde — 6/3/22

Dakota Wylde
Radiochemistry Primary Data Reviewer
Date

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 2205214
Client Name: Chemtech-Ford, Inc.
Client Project Name:
Client Project Number: 22E0465
Client PO Number:

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
22E0465-01	2205214-1		WATER	04-May-22	16:20
22E0465-02	2205214-2		WATER	05-May-22	11:00
22E0465-03	2205214-3		WATER	04-May-22	17:05
22E0465-04	2205214-4		WATER	04-May-22	18:10
22E0465-05	2205214-5		WATER	05-May-22	10:10

CHEMTECH-FORD LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0465

2205214

SENDING LABORATORY:

Chemtech-Ford Laboratories
9632 South 500 West
Sandy, UT 84070
Phone: 801.262.7299
Fax: 866.792.0093

RECEIVING LABORATORY:

ALS Laboratories, Ft. Collins
225 Commerce Drive
Ft. Collins, CO 80524
Phone: (800) 443-1511
Fax: (970) 490-1522

Work Order Comments:

Laboratory ID: 22E0465-01		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 16:20
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-226	EPA 903.1	

Laboratory ID: 22E0465-02		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/05/2022 11:00
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22E0465-03		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 17:05
Radium-228	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-226 LLD	EPA 903.1	

Released By	Date	Received By	Date
			5/11/22 1521
Released By	Date	Received By	Date

** NOTE - If you are not certified for our suggested analytical method, please use your certified method.*

CHEMTECH-FORD
ABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22E0465
2205214

Laboratory ID: 22E0465-04		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/04/2022 18:10
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22E0465-05		**Matrix:** Water
Requested Test	**Suggested Analytical Method ***	**Sampled:** 05/05/2022 10:10
Radium-228 Variance	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	

Released By	Date	Received By	Date
		[signature]	5/11/22 1521
Released By	Date	Received By	Date

* NOTE - If you are not certified for our suggested analytical method, please use your certified method.

ALS Environmental - Fort Colllins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: CHEMTECH Workorder No: 2205214

Project Manager: KMO Initials: AXK Date: 05/11/2022

	N/A	YES	NO
1. Are airbills / shipping documents present and/or removable?		X	
Tracking number:			
2. Are custody seals on shipping containers intact?	X		
3. Are custody seals on sample containers intact?	X		
4. Is there a COC (chain-of-custody) present?		X	
5. Is the COC in agreement with samples received? (IDs, dates, times, # of samples, # of containers, matrix, requested analyses, etc.)		X	
6. Are short-hold samples present?			X
7. Are all samples within holding times for the requested analyses?		X	
8. Were all sample containers received intact? (not broken or leaking)		X	
9. Is there sufficient sample for the requested analyses?		X	
10. Are samples in proper containers for requested analyses? (form 250, *Sample Handling Guidelines*)		X	
11. Are all aqueous samples preserved correctly, if required? (excluding volatiles)		X	
12. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, radon) free of bubbles > 6 mm (1/4 inch) diameter? (i.e. size of green pea)	X		
13. Were the samples shipped on ice?	X		
14. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #5	RAD ONLY		X

Cooler #:	1						
Temperature (°C):	AMB						
# of custody seals on cooler:	0						
External µR/hr reading:	10						
Background µR/hr reading:	11						

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? YES (If no, see Form 008.)

* Please provide details here for NO responses to boxes above - for 2 thru 5 & 7 thru 12, notify PM & continue w/ login.

Were unpreserved bottles pH checked? NA All client bottle ID's vs ALS lab ID's double-checked by: AK

If applicable, was the client contacted? YES / NO

Project Manager Signature / Date: [redacted]

Form 201r29.xls
(10/15/2019)

* IR Gun #3, VWR SN 170647571
* IR Gun #5, VWR SN 192272629

2205214

1/3
SHIP DATE: 09MAY22
ACTWGT: 52.00 LB
CAD: 7980973/NET4480
DIMS: 26x13x14 IN
BILL SENDER
TO SAMPLE RECEIPT
ALS, CO
225 COMMERCE DRIVE
FORT COLLINS CO 80524
ID-D
Amb
Ship Manager - Print Your Label(s)
FedEx
WED - 11 MAY 4:30P
** 2DAY **
TRK# 7768 0794 0476
0201
80524
CO-US DEN
4Z QFTCQ

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Method Blank Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Lab ID: RA220527-1MB

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes

Final Aliquot: 997 ml
Result Units: pCi/l
File Name: RAA0602A

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	0.01 +/- 0.40	0.90	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32130	30570	ug	95.1	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

M - Requested MDC not met.

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

DL - Decision Level

Data Package ID: *RA2205214-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Laboratory Control Sample(s)

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Lab ID: RA220527-1LCS

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 27-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes

Final Aliquot: 997 ml
Result Units: pCi/l
File Name: RAA0602A

CASNO	Target Nuclide	Results +/- 2s TPU	MDC	Spike Added	% Rec	Control Limits	Lab Qualifier
15262-20-1	Ra-228	25.8 +/- 6.0	0.9	21.54	120	70 - 130	P

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32140	29640	ug	92.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS Recovery within control limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but thereported activity is greater than the reported MDC.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Minimum Detectable Concentration

Data Package ID: *RA2205214-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-01
Lab ID: 2205214-1

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 04-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: rac0602a

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	0.24 +/- 0.40	0.85	1	NA	U

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32150	30290	ug	94.2	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RA2205214-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-02
Lab ID: 2205214-2

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 05-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: rac0602a

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	1.44 +/- 0.59	0.95	1	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32140	29440	ug	91.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RA2205214-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-03
Lab ID: 2205214-3

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 04-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: rac0602a

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	2.15 +/- 0.70	0.87	1	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32150	30530	ug	95.0	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RA2205214-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-04
Lab ID: 2205214-4

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 04-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: rac0602a

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	2.93 +/- 0.86	0.87	1	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32140	29790	ug	92.7	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RA2205214-1*

Radium-228 Analysis by GFPC

PAI 724 Rev 14

Sample Results

Lab Name: ALS -- Fort Collins
Work Order Number: 2205214
Client Name: Chemtech-Ford, Inc.
ClientProject ID: 22E0465

Field ID: 22E0465-05
Lab ID: 2205214-5

Sample Matrix: WATER
Prep SOP: SOP749 Rev 8
Date Collected: 05-May-22
Date Prepared: 27-May-22
Date Analyzed: 02-Jun-22

Prep Batch: RA220527-1
QCBatchID: RA220527-1-2
Run ID: RA220527-1A
Count Time: 150 minutes
Report Basis: Unfiltered

Final Aliquot: 997 ml
Prep Basis: Unfiltered
Moisture(%): NA
Result Units: pCi/l
File Name: rac0602a

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	DL	Lab Qualifier
15262-20-1	Ra-228	1.57 +/- 0.59	0.87	1	NA	

Chemical Yield Summary

Carrier/Tracer	Amount Added	Result	Units	Yield	Control Limits	Flag
BARIUM	32140	29760	ug	92.6	40 - 110 %	

Comments:

Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

Abbreviations:

TPU - Total Propagated Uncertainty

MDC - Sample specific Minimum Detectable Concentration

BDL - Below Detection Limit

DL - Decision Level

Data Package ID: *RA2205214-1*

ATTACHMENT B:

Field Summary Report – October 2022 Event

Water & Environmental TECHNOLOGIES

Field Summary Report

Facility Name: Hunter Power Plant – CCR Landfill
Event Description: Assessment Monitoring
Event Dates: October 26-27, 2022
Field Personnel: Dennis Vanderbeek

ACTIVITY SUMMARY. PacifiCorp personnel arrived onsite October 26, 2022 and performed groundwater sampling at Hunter CCR Landfill. Prior to collecting samples, field instruments were calibrated, followed by the collection of water levels in the CCR monitoring wells. After recording water levels, the wells were purged in accordance with the EPA low-flow method. Field parameters were monitored during well purging in accordance with the site-specific sampling and analysis plan (SAP). Once field parameters met the SAP stabilization requirements, groundwater samples were collected for Appendix III and Appendix IV constituents. All calibration data and field measurements were recorded on the WET electronic field form. The wells that underwent sampling during this sampling event included:

- ELF-10
- ELF-11
- ELF-12
- ELF-13
- ELF-14
- ELF-1D
- ELF-2
- ELF-3
- ELF-4
- ELF-5R
- ELF-6R
- ELF-7
- ELF-8
- ELF-9
- ELF-15
- ELF-16
- ELF-17

The following details dates for conducting field work and post-field work data processing:

- Date fieldwork completed: 10/27/2022
- Dates unvalidated lab data received:11/17/2022 & 12/13/2022
- Data validation completion date: 12/22/2022

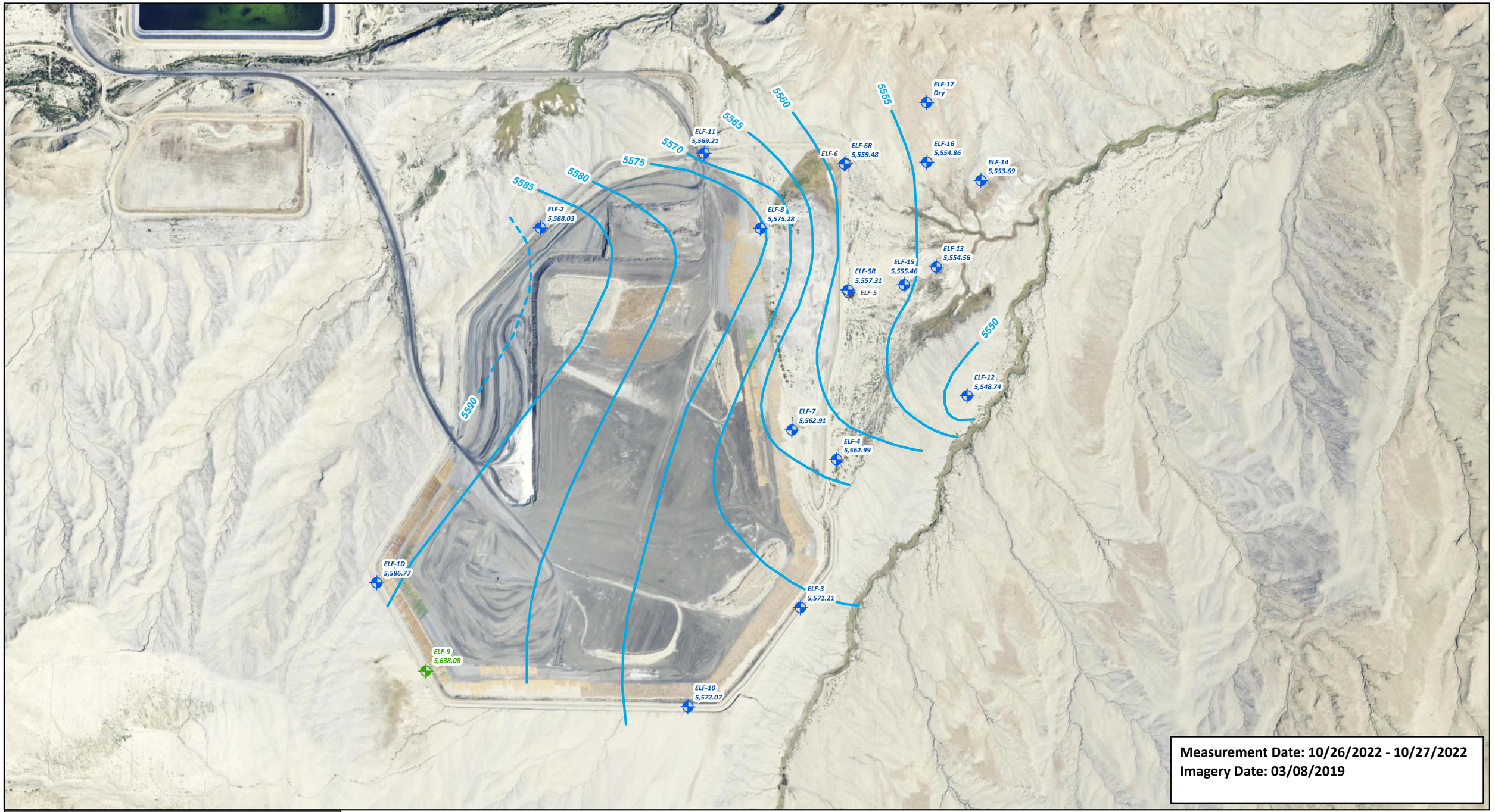
After collection, the samples were preserved in accordance with the SAP, placed on ice, chain of custody forms were completed, and the samples were transported to Chemtech-Ford in Sandy, Utah. Samples arrived at Chemtech-Ford on 10/28/2022. Chemtech-Ford subcontracted Radium analyses to Pace Analytical in Mount Juliet, Tennessee. Samples arrived at Pace Analytical on 11/1/2022. The following information is attached to this summary as a supplement:

- Attachment A: Groundwater Contour Map
- Attachment B: Data Validation Summary
- Attachment C: Statistical Analysis
- Attachment D: Field Data Sheets
- Attachment E: Laboratory Analytical Reports

SAP DEVIATIONS. Wells ELF-3, ELF-17 and ELF-1D did not have enough water to sample.

Attachment A:

Groundwater Contour Map



ELF-1D = Well ID
5,586.77 = Water Level Elevation (ft.)

- CCR Well
- CCR Well - For Water Quality Only
- CCR Well - Abandoned
- Groundwater Elevation Contour (Contour Interval = 5 ft.)
- Inferred Groundwater Elevation Contour (Contour Interval = 5 ft.)

N
W E
S

0 500 1,000 2,000 3,000 Feet

PACIFICORP

WET Water & Environmental TECHNOLOGIES

HUNTER POWER PLANT

Groundwater Elevation Map CCR Landfill - Fall 2022

Job#: PERCM052

Date: 1/11/2023

Attachment A

Path: M:\PERC\PERC_CCR\GIS\2022_CCR_Sampling\Hunter\GIS\2022_CCR_Sampling\2022_CCR_Sampling.aprx, Author: jhulla

Attachment B:

Data Validation Summary

DATA VALIDATION SUMMARY
CCR COMPLIANCE SAMPLING

Facility Name:	Hunter Power Plant	
Validator:	Janelle Garza (12/21/2022)	
Reviewer:	Marcus Holland (12/22/2022)	
Laboratories:	Chemtech-Ford Laboratories; Sandy, UT Pace Analytical National; Mount Juliet, TN (third party lab for Ra analyses)	
Laboratory Work Order# and Sample IDs:	22J2269: CCR 22J2268: Radium analyses	
Collection Date(s):	October 26-27, 2022	
Sample Media:	Aqueous (groundwater)	
Analytical Parameters:	**Inorganic** • Chloride, Fluoride, and Sulfate by EPA 300.0 • pH by SM 4500 H-B • Total Dissolved Solids (TDS) by SM 2540 C **Total Metals by EPA 200.7/8** • Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Lead (Pb), Lithium (Li), Molybdenum (Mo), Selenium (Se), and Thallium (Tl) **Total Mercury (Hg) by EPA 245.1** **Radium** • Radium-226 by EPA 903.1 • Radium-228 by EPA 904.0	
Review Element:	**Complete / Criteria Met? (Yes/No)**	**If no, describe:**
Chain of Custody:	Yes	
Field Documentation:	Yes	
Holding Times & Sample Preservation:	No	Holding Time pH in all samples was analyzed past the 15-minute holding time. However, lab pH was compared to final stabilized field pH. If the lab pH was within +/-0.10 of the final stabilized field pH, then the lab pH was considered acceptable. ❖ The Field Blank – (CCR), consistent of deionized (DI) water, was within an acceptable pH range of 5.5 to 7.0; therefore, no qualification was required. ❖ ELF-2, ELF-9, and ELF-12 were qualified as estimated high (J+). ❖ No qualification was required for all remaining samples.
Calibrations:	Yes	
Blanks:	No	Field Field Blank – (CCR): representing the entire sample group. ❖ TDS was detected at 28,500 mg/L, above the RL of 100 mg/L.

		➢ All samples were qualified as estimated high (J+) due to results ≥ the RL but <10x the field blank value. ❖ Ra-226 was detected at 0.100 pCi/L, below the MDA of 0.273 pCi/L and <2σ. No qualification required. <u>Laboratory</u> Method 903.0/9315 ❖ Batch WG1961181: all samples ➢ Ra-226 was detected at 0.182 pCi/L, above the MDA of 0.171 pCi/L. ▪ ELF-9, ELF-11, and Field Blank – (CCR) did not require qualification due to results ≤ the MDA. ▪ ELF-12 did not require qualification due to a result > the MDA, a mean difference >3, and a difference factor ≥10. ▪ ELF-10 was qualified as an estimated detection (J) due to a result > the MDA, a mean difference >2, and a difference factor <10. ▪ All remaining samples were qualified as estimated ND (UJ) due to results > the MDA, mean differences between 0 and 2, and difference factors <10. Method 904/9320 ❖ Batch WG1960606: all samples except Field Blank – (CCR) ➢ Ra-228 was detected at 0.212 pCi/L, below the MDA of 0.310 pCi/L and <2σ. No qualification required. Method EPA 200.7 ❖ Batch BWK0031: Field Blank – (CCR) ➢ Lithium was detected at 0.009 mg/L, above the RL of 0.005 mg/L. ▪ No qualification was required for this sample due to a ND result.
Laboratory Control Sample:	Yes	
Duplicates:	No	<u>Field</u> ELF-6R (original) and Duplicate – (CCR) (duplicate): representing the entire sample group ❖ Ra-226 RPD was 37.4%, above the 20% limit. The mean difference was 0.33, below the limit of 3. No qualification required. ❖ Molybdenum: The original sample result was detected (<5x the RL) while the duplicate sample result was ND and replaced with zero to give a 200% RPD, above the 20% limit. The absolute difference between the detected original sample

		result and zero (ND duplicate sample result) was > the RL. ➢ ELF-12, Duplicate – (CCR), and Field Blank – (CCR) were qualified as estimated ND (UJ). ➢ All remaining samples were qualified as estimated detections (J). ❖ TDS RPD was 23.1%, above the 20% limit. Both the original and the duplicate sample results were ≥5x the RL. ➢ All samples were qualified as estimated detections (J). ▪ All samples except Field Blank – (CCR) were more specifically qualified as estimated high (J+) due to field blank contamination. <u>Laboratory</u> Method 903.0/9315 ❖ Batch WG1961181: all samples ➢ Ra-226 RPD was 67.8%, above the 20% limit. The laboratory-calculated RER was 0.232, below the limit of 3. No qualification required. Method 904/9320 ❖ Batch WG1960606: all samples except Field Blank – (CCR) ➢ Ra-228 RPD was 167%, above the 20% limit. The laboratory-calculated RER was 1.26, below the limit of 3. No qualification required.
Matrix Spike:	No	Method EPA 200.7 ❖ Batch BWK0017: Lab IDs 01-09 ➢ QC Sample ID BWK0017-MS1/MSD1: Sample ID ELF-2 ▪ Boron was recovered at 131% (MSD), above the 70-130% control limits. • The lab flagged these as 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. ♦ No qualification required. ▪ Calcium was recovered at 162% (MS) and 245% (MSD), above the 70-130% control limits. • The lab flagged these as 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. ♦ No qualification required. ❖ Batch BWK0040: Lab IDs 10-15 ➢ QC Sample ID BWK0040-MS2: unassociated work order ▪ Calcium was recovered at 69.1% (MS), below the 70-130% control limits. • The lab flagged these as 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. ♦ No qualification required. Method EPA 245.1 ❖ Batch BWK0110: Lab IDs 01-11 ➢ QC Sample ID BWK0110-MS1/MSD1: Sample ID ELF-2 ▪ Mercury was recovered at 126% (MS) and 128% (MSD), above the 75-125% control limits. • The lab flagged these as 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. ♦ Due to professional judgment, the batch will still be qualified based on the high MS/MSD recoveries. ✓ No qualification was required for any samples due to all ND results. Method EPA 300.0 ❖ Batch BWJ1451 ➢ QC Sample ID BWJ1451-MS1: Sample ID ELF-2 ▪ Chloride was recovered at 69.3% (MS), below the 80-120% control limits. • The lab flagged these as 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. ♦ Due to professional judgment, the batch will still be qualified based on the low MS recovery. ♦ Lab IDs included in batch: 01 and 07 ✓ ELF-2 (01) and ELF-9 (07) were qualified as estimated low (J-) due to detected results. ➢ QC Sample ID BWJ1451-MS2/MSD2: unassociated work order ▪ Fluoride was recovered at 79.2% (MS and MSD), below the 80-120% control limits. • The lab flagged these as 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. ♦ Due to professional judgment, the batch will still be qualified based on the low MSD recovery. ♦ Lab IDs included in batch: 01-09 ✓ ELF-8 (06) and ELF-9 (07) were qualified as estimated low (J-) due to detected results. ✓ All remaining samples were qualified as estimated ND (UJ). ❖ Batch BWJ1451: Lab ID 10 ➢ QC Sample ID BWJ1472-MS2: unassociated work order ▪ Chloride was recovered at 63.9% (MS), below the 80-120% limits. • The lab flagged these as 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. ♦ Due to professional judgment, the batch will still be qualified based on the low MSD recovery. ✓ ELF-12 (10) was qualified as estimated low (J-) due to a detected result. ❖ Batch BWK0025: Lab IDs 01-03

		➢ QC Sample ID BWK0025-MS1/MSD1: Sample ID ELF-2 ▪ Sulfate was recovered at -147% (MS) and -131% (MSD), below the 80-120% limits. • The lab flagged these as 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. ♦ No qualification required. ❖ Batch BWK0169: Lab IDs 13-16 ➢ QC Sample ID BWK0169-MS2/MSD2: unassociated work order ▪ Chloride was recovered at 62.7% (MS) and 63.8% (MSD), below the 80-120% limits. • The lab flagged these as 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. ♦ No qualification required. ❖ Batch BWK0736: Lab ID 08 ➢ QC Sample ID BWK0736-MS1/MSD1: unassociated work order ▪ Chloride was recovered at -2,410% (MS) and -2,440% (MSD), below the 80-120% limits. • The lab flagged these as 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. ♦ No qualification required. ▪ Sulfate was recovered at -37,400% (MS and MSD), below the 80-120% limits. • The lab flagged these as 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. ♦ No qualification required.
Other:	Yes	The laboratory qualified Ra-226 in ELF-9, ELF-11, and Field Blank – (CCR) as J, indication the identification of the analyte is acceptable but the reported value is an estimate.
Overall Assessment:		
Out of 352 total data points, 290 data points (82.4%) remain unqualified, or were qualified as ND (U), and are considered quantitative data. The remaining 62 data points (17.6%) were qualified as estimated due to results exceeding instrument calibration, field and laboratory blank contamination, poor field replication, holding time exceedance (pH), and poor laboratory accuracy (MS/MSD failures), and are considered qualitative data. No data points were rejected; thus, this sample delivery group is 100% complete and usable.		

Attachment C:

Statistical Analysis

CONTENTS

1.0 INTRODUCTION 1

2.0 PRELIMINARY DATA ANALYSIS 1

2.1 Data Analysis Techniques 1

2.1.1 Mean 2

2.1.2 Standard Deviation 2

2.1.3 Coefficient of Variance 2

2.1.4 Quartiles and the Five Number Summary 3

2.2 Visual Tools 3

2.2.1 Histograms 3

2.2.2 Dot Plots 4

2.2.3 Outliers 5

2.2.4 Treatment of Non-Detects 5

2.3 Summary Results 6

3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON 11

3.1 Groundwater Protection Standards 12

3.1.1 Normal Distribution 12

3.1.2 Upper Tolerance Limits and Groundwater Protection Standard 13

4.0 CONCLUSIONS 15

5.0 REFERENCES 16

LIST OF FIGURES

Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells

Figure C.2. Dot plot of fluoride data from the CCR Landfill upgradient wells

Figure C.3. Histograms and dot plots for the upgradient CCR Landfill data

Figure C.4. Background upper tolerance limit plots for the CCR Landfill

LIST OF TABLES

Table C.1. Summary statistics for the CCR Landfill upgradient wells

Table C.2. Five-number summary for the CCR Landfill upgradient wells

Table C.3. Shapiro-Wilk Test for the CCR Landfill upgradient wells

Table C.4. Comparison of downgradient wells to the Groundwater Protection Standard

1.0 INTRODUCTION

This appendix contains statistical analysis for data collected from the groundwater monitoring network for the CCR Landfill at the Hunter Power Plant in Castle Dale, Utah. Methods used to compare upgradient with downgradient wells vary depending on the characteristics of the upgradient well data. Upgradient well data were analyzed for outliers, normality, non-detects, and other characteristics that affect the comparison measures. A comprehensive statistical analysis is presented along with a discussion of the methods used to compare upgradient with downgradient water quality.

Data collected from the upgradient wells from October 2015 through October 2022 were used to compute the groundwater protection standards (GWPS). Data collected from the downgradient wells during the October 2022 sampling event were compared to the GWPS to evaluate compliance. Table C.1 lists the upgradient and downgradient wells that comprise the Ash Pond monitoring network. Note that if a well appears in Table C.1 and not in the tables and figures in this appendix, a sample could not be obtained from that well during the most recent event.

Table C.1. Upgradient and downgradient wells for the CCR Landfill.

Upgradient Well	Downgradient Well
ELF-1D	ELF-11
ELF-2	ELF-12
ELF-9	ELF-13
ELF-10	ELF-14
	ELF-3
	ELF-4
	ELF-7
	ELF-8

2.0 PRELIMINARY DATA ANALYSIS

The primary purpose of the statistical analysis was to establish background values from the upgradient well data, develop GWPS, and compare downgradient well data to determine water quality has been impacted by the CCR Landfill. Familiarity with numerical and distributional characteristics of the upgradient wells aids in computing appropriate limits and in correctly interpreting those limits. This section contains a statistical summary of the upgradient well data. It is essential to understand the statistical characteristics of the data, prior to making the upgradient / downgradient well comparison. This understanding helps to ensure the appropriate calculations have been done and comparisons are completed using the proper statistical measures. The mean, standard deviation, quartiles, and other statistical quantities and corresponding graphs are presented in the following sections.

2.1 Data Analysis Techniques

The following sections summarize the statistical tools and techniques, used to evaluate upgradient well data from the CCR Landfill.

2.1.1 Mean

One measure of primary interest is the center of the data. The average ($\bar{x}$), or the mean, is the most commonly used measure of the central tendency of the data. However, it can be heavily influenced by outliers and by asymmetric data. The mean is calculated using Equation (1):

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \quad (1)$$

Where:

$\bar{x}$ = mean

n = number of observations

x_i = i^{th} observation.

2.1.2 Standard Deviation

Another quantity of interest is the spread of the data. The standard deviation (s) is the most commonly used measure of spread, as it is easy to interpret and is used in many other statistical methods. Because it is calculated using the average, it is also sensitive to outliers and affected by data that are not symmetric. The standard deviation is calculated using Equation (2):

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}} \quad (2)$$

Where:

s = standard deviation

n = number of observations

x_i = i^{th} observation

$\bar{x}$ = mean of the observations.

2.1.3 Coefficient of Variance

The coefficient of variance (CV) is a relative measure of variation in the sample data which expresses the standard deviation relative to the mean. The CV is expressed as a percentage and provides a direct comparison to the standard deviations of two different data sets. It is important to note the mean of the data may be very close to or very far away from zero and the spread may be independent of the distance from the mean to zero. Therefore, no firm guidelines have been established for interpreting the CV.

The CV was calculated for each detected analyte in each data grouping using Equation (3):

$$CV = \frac{s}{\bar{X}} \times 100\% \quad (3)$$

Where:

s = standard deviation

$\bar{X}$ = mean of the observations

2.1.4 Quartiles and the Five Number Summary

The five-number summary is a set of five numbers that are used to assess the spread of the data. It consists of the minimum value, first quartile, median, third quartile, and maximum of the data value. The first quartile is the 25th percentile of the data, the median is the 50th percentile of the data, and the third quartile is the 75th percentile of the data. The 25th percentile of the data is the number such that 25% of the data are less than that number and 75% of the data are above the 25th percentile. The median and third quartiles are found in a similar manner.

2.2 Visual Tools

It is difficult to review numerical summary statistics and identify the degree of symmetry or normality of data without the aid of visual tools. In completing the statistical analysis for the CCR Landfill, histograms and dot plots were developed for each of the analytes with at least one detectable observation. All graphs were developed using the R Statistical Package (R Core Team 2022).

2.2.1 Histograms

Histograms display the distribution and symmetry of the data. The data are displayed in such a way, that deviations from a normal (i.e., bell shaped) distribution can easily be observed. Outliers are also often identifiable in a histogram. Histograms for the upgradient wells were generated using both non-detects and detected results. The method detection limits (MDL) are plotted on the histogram with a blue line to show which observations are non-detects.

If an analyte has more than one MDL there will be more than one blue line on the histogram. Figure C.1 below is a histogram of fluoride data for the upgradient wells for the CCR Landfill. It is provided here to illustrate data distribution using a histogram. All of the histograms used to examine the analytes from the CCR Landfill upgradient well data, are provided at the end of this appendix in Figure C.3.

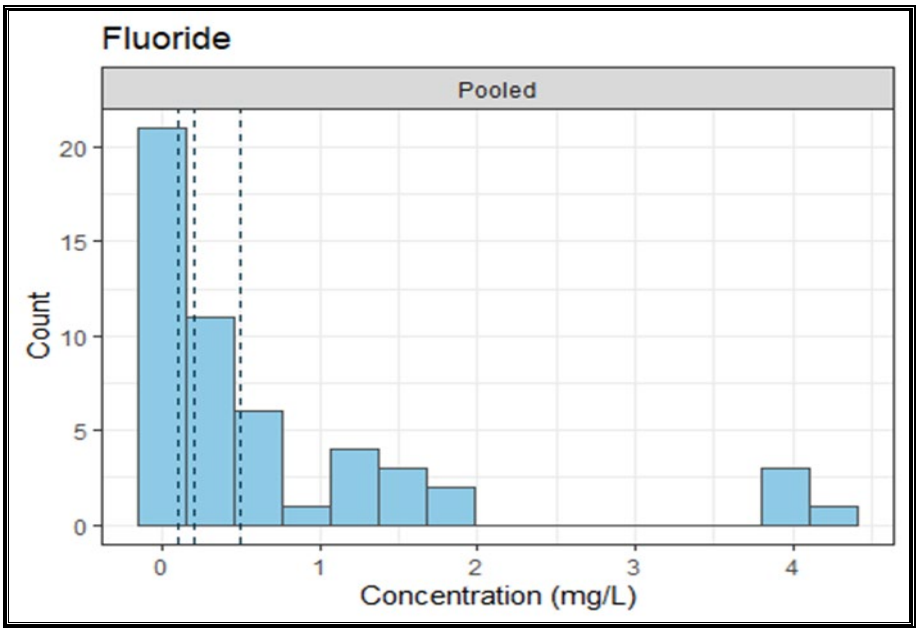


Figure C.1. Histogram of fluoride data from the CCR Landfill upgradient wells.

2.2.2 Dot Plots

A dot plot is a graphical tool used to determine the spread of the data and to look for outliers. Each measured concentration is plotted on the graph so that non-detects and outliers are clearly visible. The MDL for non-detects are shown as green points on the plot. Figure C.2 uses the same fluoride data points used to develop the Figure C.1. Several of the points are non-detects and the concentrations in well ELF-10 are larger than those in the other wells. All of the dot plots used to examine the CCR Landfill upgradient well data are provided at the end of this appendix in Figure C.3.

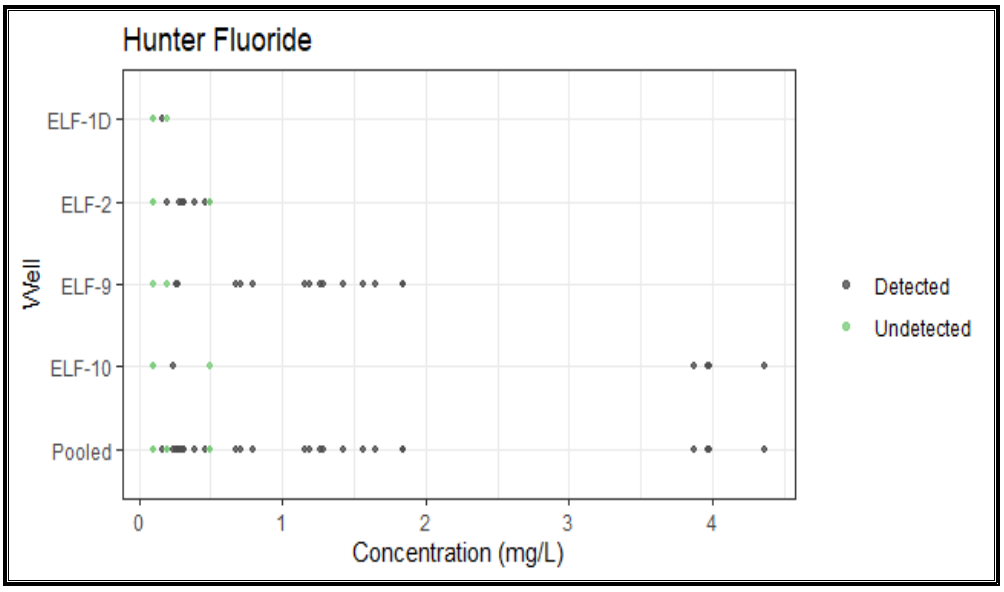


Figure C.2. Dot plot of fluoride data the CCR Landfill upgradient wells

2.2.3 Outliers

Outliers are data points that are notably larger or smaller than the rest of the data set and may indicate a problem with the data point or the data set as a whole. Examples which may be indicative of outliers include: 1) a misreported or erroneous concentration, 2) analytical error(s), or 3) natural variations in groundwater concentrations. Outliers are generally not omitted from project data simply because they are outliers. Rather, the result is examined individually or by project, to ensure the outlier does not represent an erroneous result or another concern warranting either additional sampling or omission of the outlier from the data analysis. There are reasonable situations when it is appropriate to remove outliers. For example, if outliers which represent exceedingly low concentrations are used to compute background concentrations, they may result in background levels which are too conservative. Conversely, use of excessively high outlier concentrations to compute background values, may result in an overestimation of background concentrations resulting in false-negative comparisons for downgradient groundwater quality.

Outliers were detected in the arsenic, boron, cadmium, fluoride, lead, and radium data CCR Landfill data. However, only the arsenic outlier is extreme enough to warrant removal from the dataset. Figure C.5 shows the concentration of the arsenic outlier relative to the other observed arsenic concentrations. This outlier was not included in the GWPS calculation because it would have resulted in an inflated GWPS. The MDLs for the non-detects in the boron upgradient data in February 2016 and August 2019 were 5 mg/L and the largest detected value was less than 4 mg/L. This is an unusually large MDL and its inclusion would have resulted in a GWPS that was larger than any concentration detected in the upgradient wells. Thus, the non-detects were removed from the upgradient boron data and are not included in any tables or graphs in this appendix. The fluoride data for the May 2022 sampling event were all non-detects with unusually high detection limits so they were not included in the analysis. Fluoride was reassessed during this Fall 2022 sampling event and detection limits were within the normally expected ranges. As a result, the fluoride from the most recent sampling event is included in the calculations in this report.

2.2.4 Treatment of Non-Detects

Non-detect values are common in environmental data. When present in data sets, non-detects produce difficulties in computing statistical metrics because reliable values cannot be assigned. Substituting a value such as the MDL or one-half of the MDL for non-detects are common practices. However, use of the detection limit, or one-half of the detection limit, can produce unstable or unreliable results (EPA 2009). Statistical methods, such as Kaplan-Meier (Helsel 2004), can be used to appropriately evaluate data sets containing significant quantities of non-detects, by producing estimates of the survival probability function for non-detects. These estimates can then be used to compute summary statistics on the data set. However, Kaplan-Meier does not perform well if more than 50% of the results are non-detects or if fewer than eight detections are available for evaluation.

The antimony, arsenic, cadmium, chromium, cobalt, and lead data have more than 50% non-detects. Beryllium, mercury, and thallium were not detected in any of the samples. Thus, statistical analysis cannot be done for those analytes. The fluoride and selenium data have more

than 15% non-detects, but more than half of the data are detected. As a result, Kaplan-Meier was used to compute means, standard deviations, and statistical limits used to compare the upgradient to downgradient water quality for fluoride and selenium.

2.3 Summary Results

Table C.2 provides summary statistics for the CCR Landfill upgradient well data. Although the data from the upgradient wells were combined when compared to the downgradient wells, the summary statistics presented in this section are separated by well and are presented as pooled data. The data are presented in this way, due to observed differences between the different wells for many of the analytes. These tables in conjunction with the histograms and normal-quantile plots, provide information about differences between wells and the data properties of the combined data. Note that summary stats were only computed for analytes and wells with at least 50% detects and at least eight detected samples. Analytes that were not detected in any upgradient well samples are not listed in Table C.2.

Table C.2. Summary statistics for the CCR Landfill upgradient wells

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Antimony	ELF-1D	5	0	<0.004	NA	NA	NA
Antimony	ELF-2	20	0	<0.002	NA	NA	NA
Antimony	ELF-9	18	2	<0.002	NA	NA	NA
Antimony	ELF-10	15	0	<0.002	NA	NA	NA
Antimony	Pooled	58	2	<0.002	NA	NA	NA
Arsenic	ELF-1D	5	0	<0.002	NA	NA	NA
Arsenic	ELF-2	20	2	<0.002	NA	NA	NA
Arsenic	ELF-9	18	18	0.0067	0.0069	0.0022	32
Arsenic	ELF-10	14	3	<0.002	NA	NA	NA
Arsenic	Pooled	57	23	<0.002	NA	NA	NA
Barium	ELF-1D	5	5	0.0103	NA	NA	NA
Barium	ELF-2	20	19	0.0101	0.0129	0.0091	71
Barium	ELF-9	18	18	0.0151	0.0339	0.0315	93
Barium	ELF-10	15	15	0.0353	0.0384	0.0214	56
Barium	Pooled	58	57	0.0132	0.0257	0.0241	94
Boron	ELF-1D	4	4	2.15	NA	NA	NA
Boron	ELF-2	19	19	3.31	3.31	0.20	6
Boron	ELF-9	16	16	1.38	1.44	0.22	15
Boron	ELF-10	14	14	1.60	1.63	0.18	11
Boron	Pooled	53	53	1.84	2.21	0.87	39
Cadmium	ELF-1D	5	0	<0.0005	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Cadmium	ELF-2	20	0	<0.0005	NA	NA	NA
Cadmium	ELF-9	18	1	<0.0005	NA	NA	NA
Cadmium	ELF-10	15	6	<0.0005	NA	NA	NA
Cadmium	Pooled	58	7	<0.0005	NA	NA	NA
Calcium	ELF-1D	4	4	372	NA	NA	NA
Calcium	ELF-2	19	19	398	398	21.4	5
Calcium	ELF-9	17	17	60.3	75.6	31.7	42
Calcium	ELF-10	14	14	477	479	35.5	7
Calcium	Pooled	54	54	393	316	170	54
Chloride	ELF-1D	4	4	6760	NA	NA	NA
Chloride	ELF-2	19	19	363	335	122	36
Chloride	ELF-9	17	17	391	400	96.4	24
Chloride	ELF-10	14	14	7600	8918	2506	28
Chloride	Pooled	54	54	459	3059	4074	133
Chromium	ELF-1D	5	1	<0.002	NA	NA	NA
Chromium	ELF-2	20	2	<0.002	NA	NA	NA
Chromium	ELF-9	18	7	<0.0028	NA	NA	NA
Chromium	ELF-10	15	11	0.003	0.0049	0.0039	81
Chromium	Pooled	58	21	<0.002	NA	NA	NA
Cobalt	ELF-1D	5	1	<0.004	NA	NA	NA
Cobalt	ELF-2	20	12	0.0046	0.0054	0.0020	38
Cobalt	ELF-9	18	4	<0.004	NA	NA	NA
Cobalt	ELF-10	15	11	0.0043	0.0049	0.0013	27
Cobalt	Pooled	58	28	<0.004	NA	NA	NA
Fluoride	ELF-1D	4	1	<0.13	NA	NA	NA
Fluoride	ELF-2	18	9	0.10	0.22	0.15	71
Fluoride	ELF-9	16	14	1.18	1.02	0.59	59
Fluoride	ELF-10	14	5	<0.1	NA	NA	NA
Fluoride	Pooled	52	29	0.25	0.74	1.09	147
Lead	ELF-1D	5	0	<0.002	NA	NA	NA
Lead	ELF-2	20	1	<0.002	NA	NA	NA
Lead	ELF-9	18	4	<0.002	NA	NA	NA
Lead	ELF-10	15	6	<0.002	NA	NA	NA
Lead	Pooled	58	11	<0.002	NA	NA	NA
Lithium	ELF-1D	5	5	2.19	NA	NA	NA

Analyte	Well	Number of Samples	Samples Detected	Median (mg/L)	Mean (mg/L)	Standard Deviation (mg/L)	Coefficient of Variation (%)
Lithium	ELF-2	20	20	1.70	2.24	1.13	51
Lithium	ELF-9	18	18	0.987	1.05	0.417	40
Lithium	ELF-10	15	15	2.17	2.35	0.99	42
Lithium	Pooled	58	58	1.63	1.90	1.03	54
Molybdenum	ELF-1D	5	5	0.0161	NA	NA	NA
Molybdenum	ELF-2	20	19	0.0030	0.0031	0.0007	23
Molybdenum	ELF-9	18	18	0.108	0.0971	0.0358	37
Molybdenum	ELF-10	15	15	0.0795	0.0735	0.0393	53
Molybdenum	Pooled	58	57	0.0346	0.0515	0.0498	97
pH	ELF-1D	4	4	7.22	NA	NA	NA
pH	ELF-2	19	19	7.24	7.30	0.159	2
pH	ELF-9	17	17	7.94	7.92	0.151	2
pH	ELF-10	14	14	7.18	7.26	0.411	6
pH	Pooled	54	54	7.32	7.48	0.390	5
Radium	ELF-1D	5	5	2.2	NA	NA	NA
Radium	ELF-2	20	20	1.56	1.96	1.62	83
Radium	ELF-9	18	17	1.44	1.47	0.568	39
Radium	ELF-10	15	15	2.41	3.02	3.24	107
Radium	Pooled	58	57	1.70	2.11	2.01	95
Selenium	ELF-1D	5	0	<0.002	NA	NA	NA
Selenium	ELF-2	20	20	0.143	0.239	0.233	97
Selenium	ELF-9	18	3	<0.002	NA	NA	NA
Selenium	ELF-10	15	10	0.0090	0.0983	0.1392	142
Selenium	Pooled	58	33	0.0044	0.1090	0.1828	168
Sulfate	ELF-1D	4	4	8790	NA	NA	NA
Sulfate	ELF-2	19	19	7950	7728	690	9
Sulfate	ELF-9	17	17	6530	6565	717	11
Sulfate	ELF-10	14	14	14950	14718	4789	33
Sulfate	Pooled	54	54	7950	9268	4132	45
TDS	ELF-1D	4	4	26900	NA	NA	NA
TDS	ELF-2	19	19	12000	12016	471	4
TDS	ELF-9	17	17	10600	10705	778	7
TDS	ELF-10	14	14	38000	37443	2387	6
TDS	Pooled	54	54	12100	19296	11653	60

Table C.3 provides the five-number summaries for the CCR Landfill upgradient wells. As with the summary statistics, a five-number summary was computed for each well as well as for the pooled data. If a minimum or a quartile falls within the range of non-detects it is denoted using a less-than (<) symbol. Analytes that were not detected in any of the upgradient well samples are not listed in Table C.3.

Table C.3. Five-number summary for the CCR Landfill upgradient wells.

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Antimony	ELF-1D	<0.002	<0.004	<0.004	<0.004	<0.004
Antimony	ELF-2	<0.0005	<0.002	<0.002	<0.004	<0.004
Antimony	ELF-9	<0.0006	<0.002	<0.002	<0.004	0.004
Antimony	ELF-10	<0.001	<0.002	<0.002	<0.0033	<0.004
Antimony	Pooled	<0.0005	<0.002	<0.002	<0.004	0.004
Arsenic	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	ELF-2	<0.0007	<0.002	<0.002	<0.002	0.002
Arsenic	ELF-9	0.0037	0.0053	0.0067	0.0075	0.0117
Arsenic	ELF-10	<0.002	<0.002	<0.002	<0.002	0.0093
Arsenic	Pooled	<0.0007	<0.002	<0.002	0.0052	0.0117
Barium	ELF-1D	0.0084	0.0085	0.0103	0.0103	0.0104
Barium	ELF-2	<0.0084	0.0096	0.0101	0.0119	0.0500
Barium	ELF-9	0.0118	0.0126	0.0151	0.0395	0.1020
Barium	ELF-10	0.0145	0.0195	0.0353	0.051	0.0863
Barium	Pooled	<0.0084	0.0103	0.0132	0.0343	0.102
Boron	ELF-1D	1.94	2.06	2.15	2.20	2.23
Boron	ELF-2	2.94	3.17	3.31	3.43	3.77
Boron	ELF-9	1.16	1.32	1.38	1.52	1.91
Boron	ELF-10	1.39	1.54	1.60	1.67	2.12
Boron	Pooled	1.16	1.50	1.84	3.18	3.77
Cadmium	ELF-1D	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	ELF-2	<0.0002	<0.0005	<0.0005	<0.0005	<0.001
Cadmium	ELF-9	<0.0002	<0.0005	<0.0005	<0.0005	0.0005
Cadmium	ELF-10	<0.0005	<0.0005	<0.0005	0.0006	0.0011
Cadmium	Pooled	<0.0002	<0.0005	<0.0005	<0.0005	0.0011
Calcium	ELF-1D	353	363	372	381	393
Calcium	ELF-2	356	384	398	417	430
Calcium	ELF-9	48.9	57.1	60.3	84.2	166
Calcium	ELF-10	407	460	477	503	543
Calcium	Pooled	48.9	96.9	393	430	543

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
Chloride	ELF-1D	6430	6588	6760	6960	7200
Chloride	ELF-2	187	216	363	452	473
Chloride	ELF-9	244	332	391	464	595
Chloride	ELF-10	5710	7128	7600	11325	13100
Chloride	Pooled	187	337	459	6858	13100
Chromium	ELF-1D	<0.002	<0.002	<0.002	<0.002	0.0023
Chromium	ELF-2	<0.001	<0.002	<0.002	<0.002	0.0110
Chromium	ELF-9	<0.002	<0.002	<0.0028	0.0055	0.0201
Chromium	ELF-10	<0.002	<0.002	0.003	0.0061	0.0164
Chromium	Pooled	<0.001	<0.002	<0.002	0.0050	0.0201
Cobalt	ELF-1D	<0.004	<0.004	<0.004	<0.004	0.0054
Cobalt	ELF-2	<0.0032	<0.004	0.0046	0.0060	0.0114
Cobalt	ELF-9	<0.0005	<0.004	<0.004	<0.004	0.0052
Cobalt	ELF-10	<0.004	<0.0041	0.0043	0.0052	0.0079
Cobalt	Pooled	<0.0005	<0.004	<0.004	0.0050	0.0114
Fluoride	ELF-1D	<0.1	<0.1	<0.13	0.17	0.20
Fluoride	ELF-2	<0.1	<0.1	0.10	0.31	0.50
Fluoride	ELF-9	<0.1	0.58	1.18	1.46	1.84
Fluoride	ELF-10	<0.1	<0.1	<0.1	3.03	4.36
Fluoride	Pooled	<0.1	<0.1	0.25	0.89	4.36
Lead	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Lead	ELF-2	<0.0005	<0.002	<0.002	<0.002	0.002
Lead	ELF-9	<0.0005	<0.002	<0.002	<0.002	0.0077
Lead	ELF-10	<0.002	<0.002	<0.002	0.0028	0.012
Lead	Pooled	<0.0005	<0.002	<0.002	<0.002	0.012
Lithium	ELF-1D	1.96	2.12	2.19	2.2	2.89
Lithium	ELF-2	1.34	1.52	1.70	2.48	4.93
Lithium	ELF-9	0.724	0.788	0.987	1.06	2.48
Lithium	ELF-10	0.841	1.82	2.17	2.90	4.59
Lithium	Pooled	0.724	1.07	1.63	2.19	4.93
Molybdenum	ELF-1D	0.0087	0.0153	0.0161	0.0165	0.0207
Molybdenum	ELF-2	<0.002	0.0027	0.0030	0.0032	0.0050
Molybdenum	ELF-9	0.0351	0.0663	0.108	0.123	0.158
Molybdenum	ELF-10	0.0131	0.0428	0.0795	0.111	0.124
Molybdenum	Pooled	<0.002	0.0032	0.0346	0.104	0.158
pH	ELF-1D	7.02	7.13	7.22	7.28	7.3

Analyte	Well	Minimum (mg/L)	First Quartile (mg/L)	Median (mg/L)	Third Quartile (mg/L)	Maximum (mg/L)
pH	ELF-2	7.12	7.20	7.24	7.38	7.76
pH	ELF-9	7.51	7.86	7.94	8.03	8.19
pH	ELF-10	6.85	6.99	7.18	7.38	8.37
pH	Pooled	6.85	7.20	7.32	7.86	8.37
Radium	ELF-1D	1.09	1.23	2.2	2.63	4.40
Radium	ELF-2	0.610	0.978	1.56	2.29	8.10
Radium	ELF-9	<0.64	1.14	1.44	1.82	2.60
Radium	ELF-10	0.46	1.67	2.41	3.14	14.2
Radium	Pooled	<0.46	1.11	1.70	2.41	14.2
Selenium	ELF-1D	<0.002	<0.002	<0.002	<0.002	<0.002
Selenium	ELF-2	0.0031	0.0092	0.143	0.454	0.608
Selenium	ELF-9	<0.002	<0.002	<0.002	<0.002	0.0095
Selenium	ELF-10	<0.002	<0.002	0.0090	0.152	0.410
Selenium	Pooled	<0.002	<0.002	0.0044	0.136	0.608
Sulfate	ELF-1D	7730	8413	8790	9380	10700
Sulfate	ELF-2	6030	7270	7950	8165	8720
Sulfate	ELF-9	5460	5930	6530	7080	8030
Sulfate	ELF-10	8610	10075	14950	19675	20700
Sulfate	Pooled	5460	6863	7950	9158	20700
TDS	ELF-1D	25000	26350	26900	27425	28700
TDS	ELF-2	11300	11650	12000	12300	13100
TDS	ELF-9	9420	10300	10600	11200	12000
TDS	ELF-10	32900	35750	38000	39350	40300
TDS	Pooled	9420	11325	12100	31850	40300

3.0 UPGRADIENT AND DOWNGRADIENT WELL COMPARISON

Groundwater quality was assessed using upper tolerance limits (UTLs) and the Maximum Contaminant Levels (MCL) for each of the Appendix III and IV analytes. The data measured from the upgradient/background wells were used to compute a UTL, which serves as the background value. The larger of the UTL and MCL was used as the Groundwater Protection Standard (GWPS). Data obtained from the downgradient wells were compared point-by-point to the GWPSs to determine if the site complies with the *Final Rule*. The software package Sanitas© v.2016, was used to compute the UTLs. As part of this evaluation, groundwater data were examined for characteristics that impact how the UTL was computed. These characteristics include the:

- Number of non-detect results

- Data distribution
- Site-wide false-positive rate (SWFPR)
- Spatial and seasonal variability.

Summary statistics and other statistical characteristics of the data are discussed in the previous section. These characteristics were used to compute the appropriate UTL for each analyte.

3.1 Groundwater Protection Standards

The shape or distribution of the data was assessed to ensure that the most appropriate UTL was used for comparison purposes. The most efficient UTL is a parametric UTL that assumes the data follow a normal distribution. If the data do not follow a normal distribution, a non-parametric UTL is typically used. Thus, the data for each analyte are assessed to determine if a parametric UTL can be computed from the data. The parametric UTL is computed using the formula below:

$$UTL = \bar{X} + \kappa \times S$$

Where:

$\bar{X}$ = the average of the background data
κ = multiplier from EPA Unified Guidance, March 2009
S = standard deviation of the background data

3.1.1 Normal Distribution

Histograms and dot plots were used to visually inspect the data for deviations from normality and to determine if outliers are present. This examination reveals that outliers are present in the data. The Shapiro-Wilk test was used to assess normality in conjunction with the normal quantile plots. If the p-value associated with the test was greater than or equal to 0.05, the data are considered normally distributed and a parametric UTL was computed using the upgradient measurements. If the p-value is less than 0.05, then the maximum detected value was used as the UTL.

Note: The 0.05 p-value is not a hard and fast rule. Parametric UTLs were computed for analytes whose p-values were sufficiently close to 0.05 as determined by the Sanitas software (Sanitas 2016).

If the data for an analyte were not normally distributed, the ladder of powers method was used to determine if a reasonable transformation existed that would produce normal data. The ladder of powers tests different monotonic transformations of the data, such as the natural logarithm or square, to see if the transformed data have a normal distribution. If a transformation within the ladder of powers can be found that produces normal data, a parametric UTL was computed using the transformed data. If a transformation was identified, it was applied to both upgradient / background and downgradient groundwater data prior to comparison.

A non-parametric UTL was computed for data that are not normally distributed and cannot be transformed. The non-parametric UTL is the largest value measured in the upgradient / background wells. Table C.4 summarizes the results of the Shapiro-Wilk test for each of the

Appendix III and IV analytes where at least 50% of the measurements were detects. An appropriate transformation was found for lithium, pH, and radium. Non-parametric UTLs were computed for all of the analytes except for lithium, pH, and radium.

Table C.4. Shapiro-Wilk Test for the CCR Landfill upgradient wells.

Analyte	W-Statistic	P-Value	Normal
Barium	0.7156	<0.0001	No
Boron	0.8343	<0.0001	No
Calcium	0.8046	<0.0001	No
Chloride	0.6980	<0.0001	No
Fluoride	0.6322	<0.0001	No
Lithium	0.8782	<0.0001	No
Square Root of Lithium	0.9371	0.0049	Yes
Molybdenum	0.8460	<0.0001	No
pH	0.9269	0.0027	No
Square Root of pH	0.9293	0.0034	Yes
Radium	0.5635	<0.0001	No
LN of Radium	0.9617	0.0644	Yes
Selenium	0.6375	<0.0001	No
Sulfate	0.7095	<0.0001	No
TDS	0.7080	<0.0001	No

3.1.2 Upper Tolerance Limits and Groundwater Protection Standard

This section contains the GWPS computed for each analyte. Table C.5 lists the UTL, MCL, and GWPS for each of the analytes in the upgradient wells. The following criteria were used for determining each GWPS:

- If more than 50% of the data were detected and have a normal distribution, a parametric UTL was computed.
- If the data were not normally distributed or more than 50% of the data were non-detects, the greater of the largest MDL and maximum detected value was used as the UTL.
- If all of the upgradient samples were non-detects, the largest MDL was used as the UTL.
- The larger of the MCL and the UTL was used as the GWPS.
- Fluoride is compared to both the MCL and the UTL if the MCL exceeds the UTL, to meet the criteria for Appendix III constituents.

Figure C.4 provides graphs developed for each of the analytes that had at least one detectable measurement in the downgradient wells. The graphs illustrate the GWPS as a horizontal line with the measurements from each of the downgradient wells plotted on the same graph. Non-detects are represented by hollow gray circles on the graphs. These graphs clearly depict how the downgradient measurements compare to the GWPS. Results above the line representing the GWPS illustrate wells exceeding the GWPS.

As the graphs illustrate, boron, cobalt, lithium, and molybdenum exceed the GWPS. Table C.5 lists site-specific background values, the MCLs where appropriate, and the GWPS for each analyte. Wells exceeding their GWPS for any analyte are listed in the right hand column. GWPS plots are not provided for analytes that were not detected in any downgradient samples.

Table C.5. Comparison of downgradient wells to the Groundwater Protection Standard

Analyte	Upper Tolerance Limit (mg/L)	Maximum Contaminant Level (mg/L)	Groundwater Protection Standard (mg/L)	Downgradient Wells that Exceed Groundwater Protection Standard
Antimony	0.004	0.006	0.006	Within Limit
Arsenic	0.0117	0.01	0.0117	Within Limit
Barium	0.102	2.0	2.0	Within Limit
Beryllium	0.0025	0.004	0.004	Within Limit
Boron	3.77	NA	3.77	ELF-4, ELF-8, ELF-11
Cadmium	0.0011	0.0050	0.0050	Within Limit
Calcium	543	NA	543	Within Limit
Chloride	13100	NA	13100	Within Limit
Chromium	0.020	0.1000	0.1000	Within Limit
Cobalt	0.0114	0.006	0.0114	ELF-8, ELF-11
Fluoride	4.36	4.0	4.36	Within Limit
Fluoride Appendix III	4.36	NA	4.36	Within Limit
Lead	0.012	0.015	0.015	Within Limit
Lithium	4.18	0.04	4.18	ELF-14
Mercury	0.0002	0.002	0.002	Within Limit
Molybdenum	0.158	0.100	0.158	ELF-8
pH Acidic Range	6.52	NA	6.52	Within Limit
pH Basic Range	8.48	NA	8.48	Within Limit
Radium	6.2	5.0	6.2	Within Limit
Selenium	0.608	0.050	0.608	Within Limit
Sulfate	20700	NA	20700	Within Limit
TDS	40300	NA	40300	Within Limit
Thallium	0.002	0.002	0.002	Within Limit

4.0 CONCLUSIONS

Groundwater data was collected from the CCR Landfill monitoring network at the Hunter Power Plant in October of 2022. A comprehensive data analysis was completed on the upgradient wells to ensure that comparisons between upgradient and downgradient wells were performed correctly. Results from this sampling event revealed statistically significant increases (SSIs) above background for Appendix III constituent boron.

SSIs above groundwater protection standards were noted for Appendix IV constituents:

- Cobalt
- Lithium
- Molybdenum

5.0 REFERENCES

EPA, 2009, "Statistical Analysis of Groundwater Monitoring Data At RCRA Facilities Unified Guidance," EPA 530/R-09-007, U.S. Environmental Protection Agency, March 2009.

Helsel, Dennis, 2004, *Nondetects and Data Analysis: Statistic for Censored Environmental Data*, New York: Wiley Interscience.

R Core Team, 2022, *R: A Language and Environment for Statistical Computing*, https://www.R-project.org, R Foundation for Statistical Computing, Vienna, Austria.

Sanitas Technologies, 2016, Sanitas, www.sanitastech.com, Shawnee, Kansas.

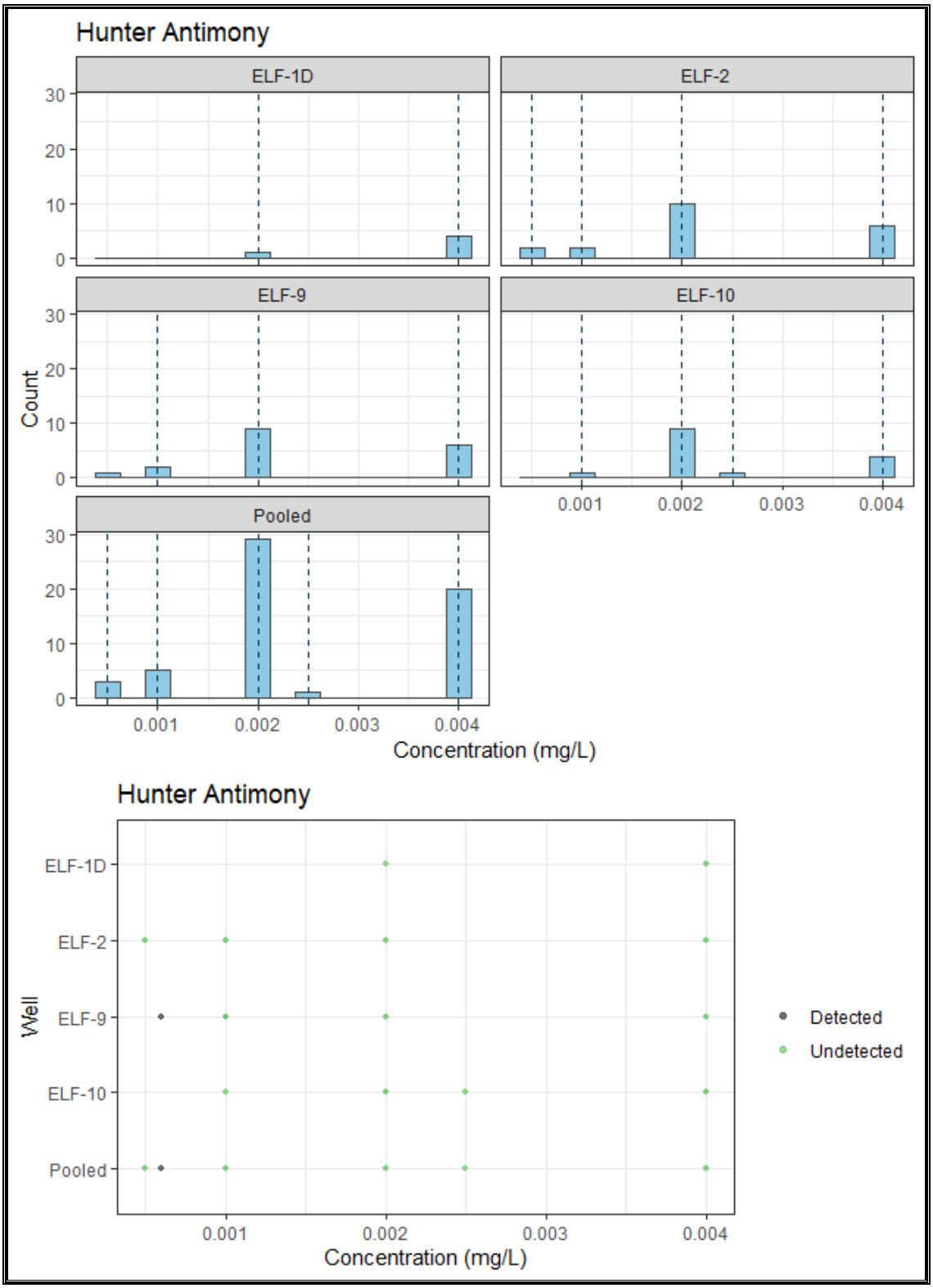


Figure C.3. Histograms and dot plots for the upgradient Ash Landfill data.

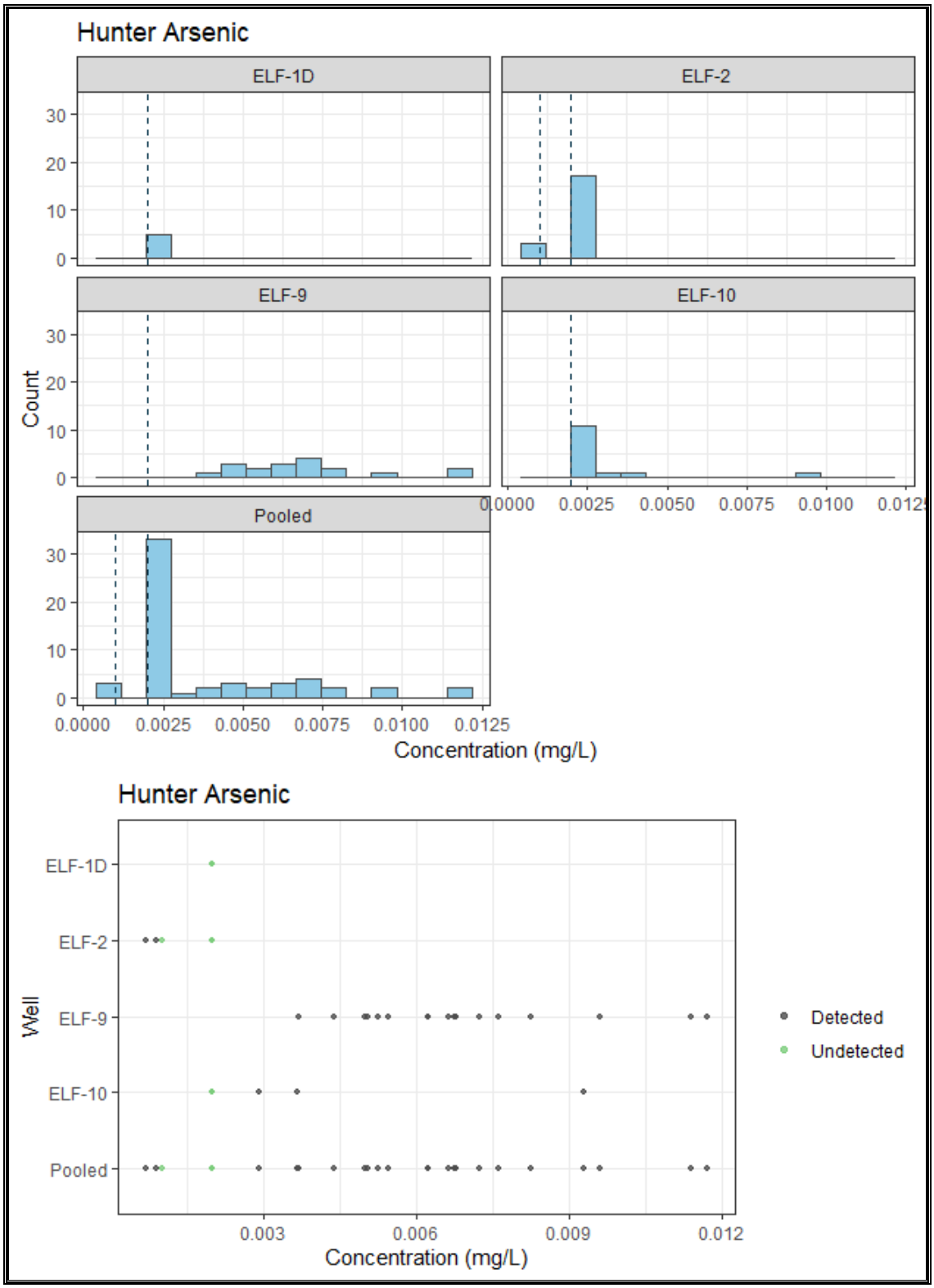


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.

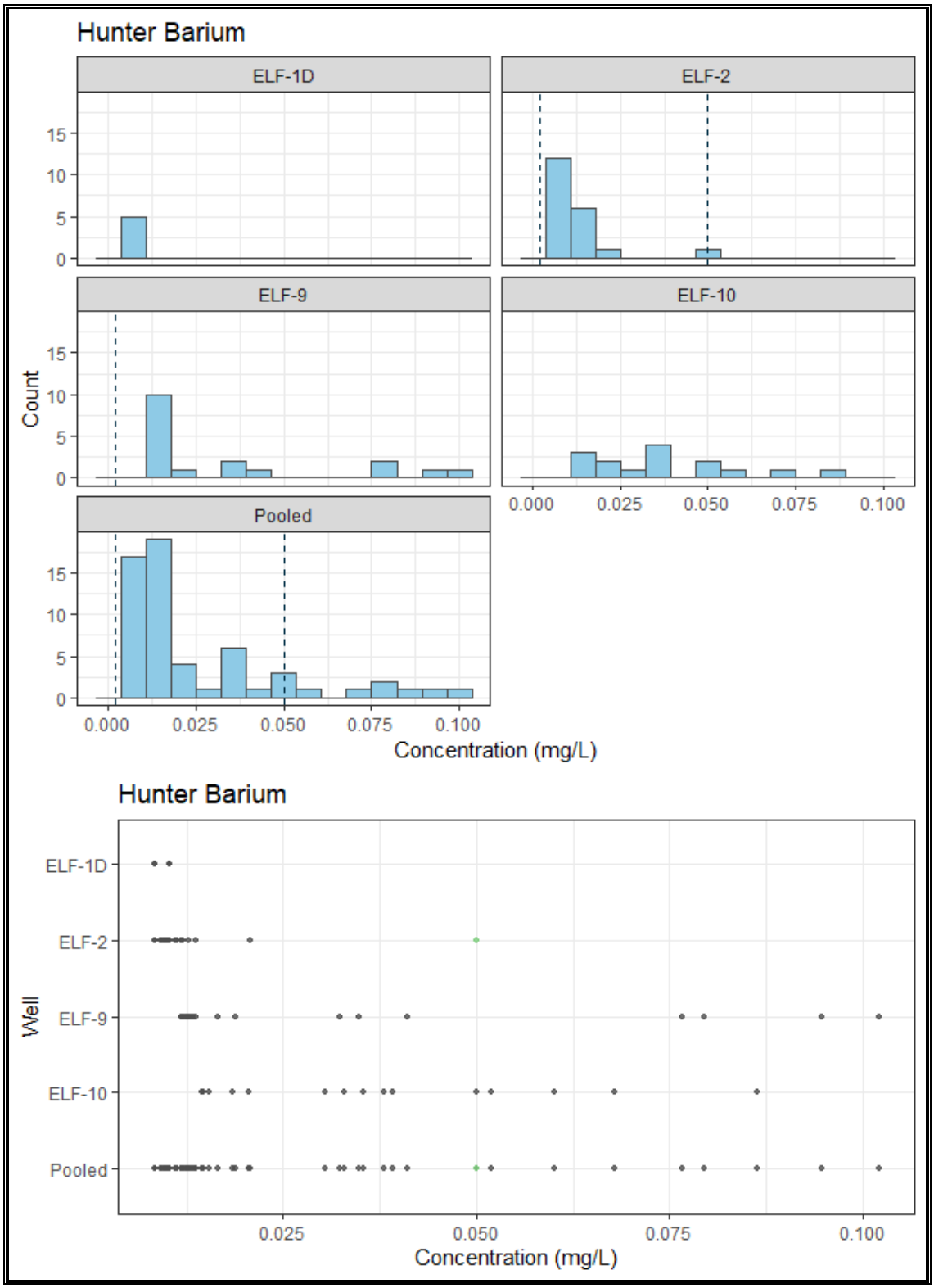
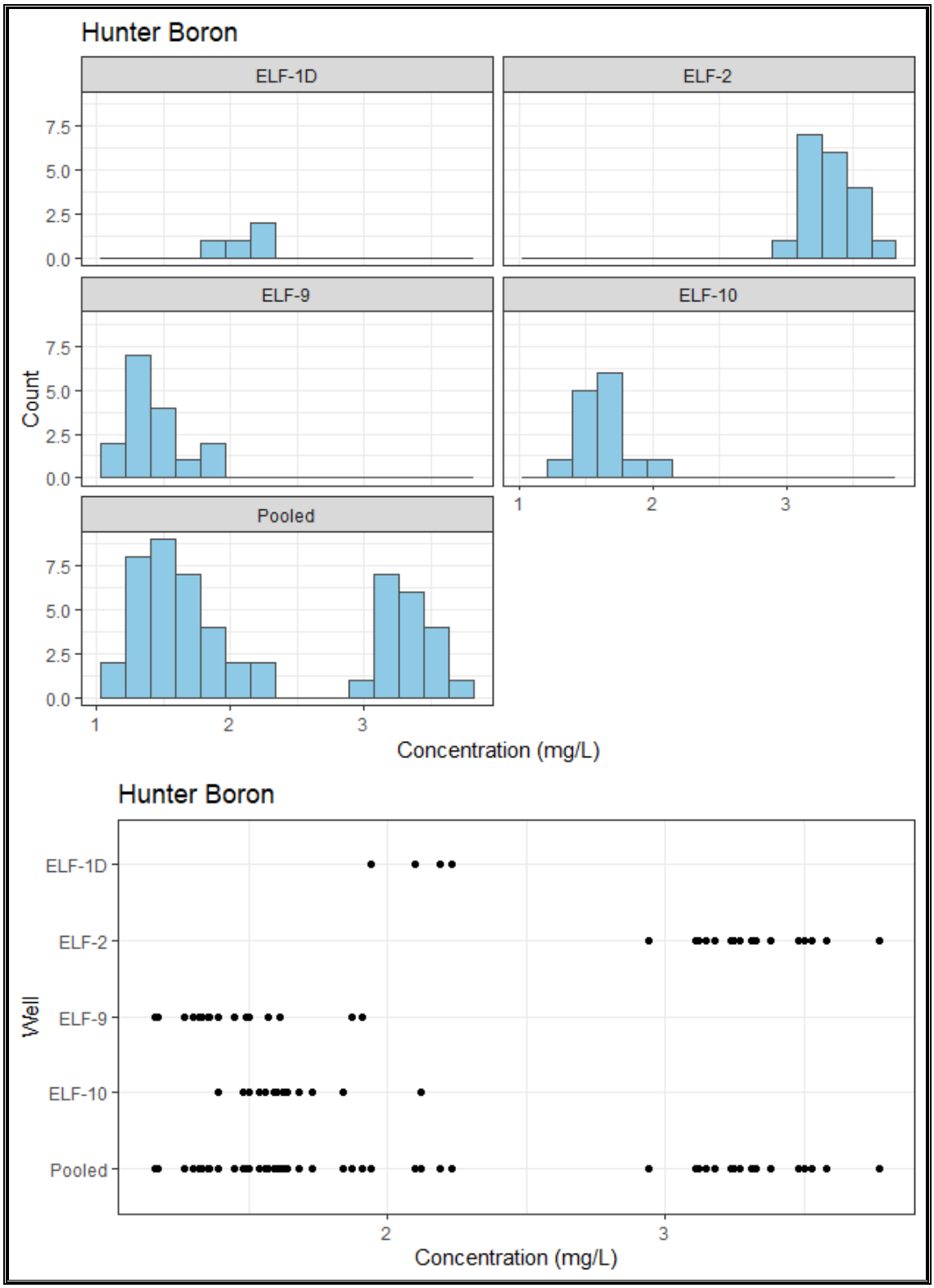


Figure C.3 (cont.). Histograms and dot plots for the upgradient Ash Landfill data.



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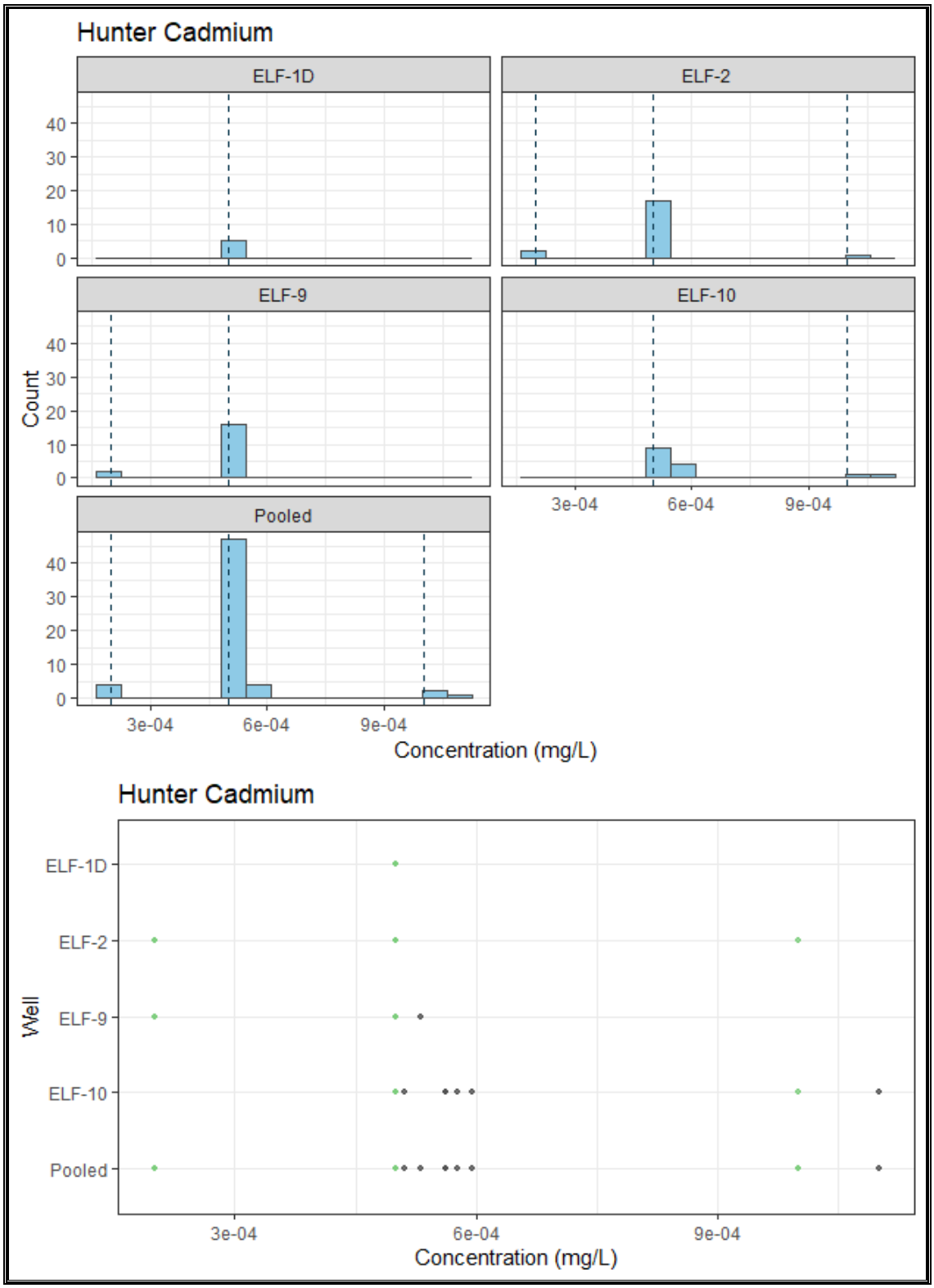

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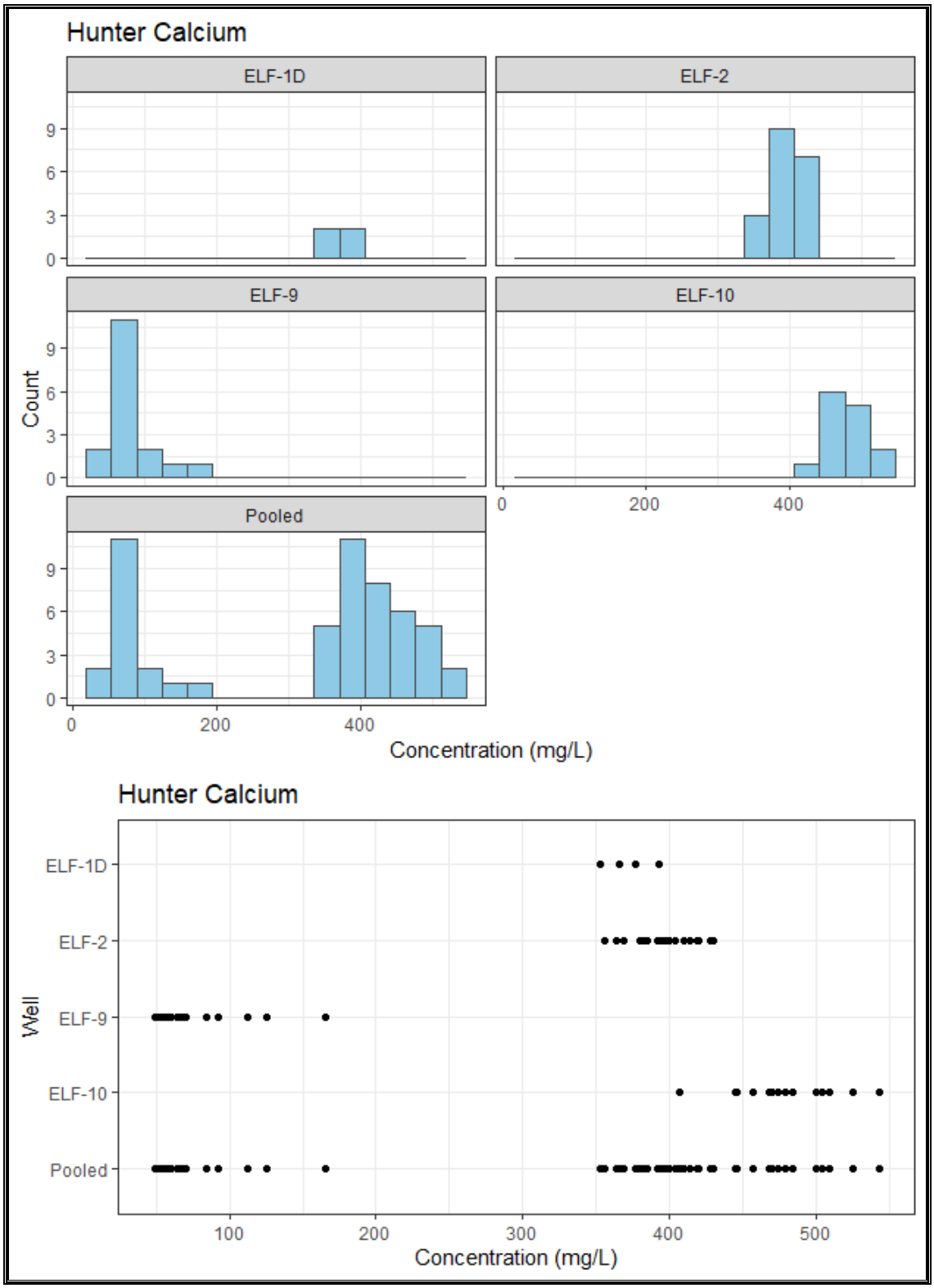

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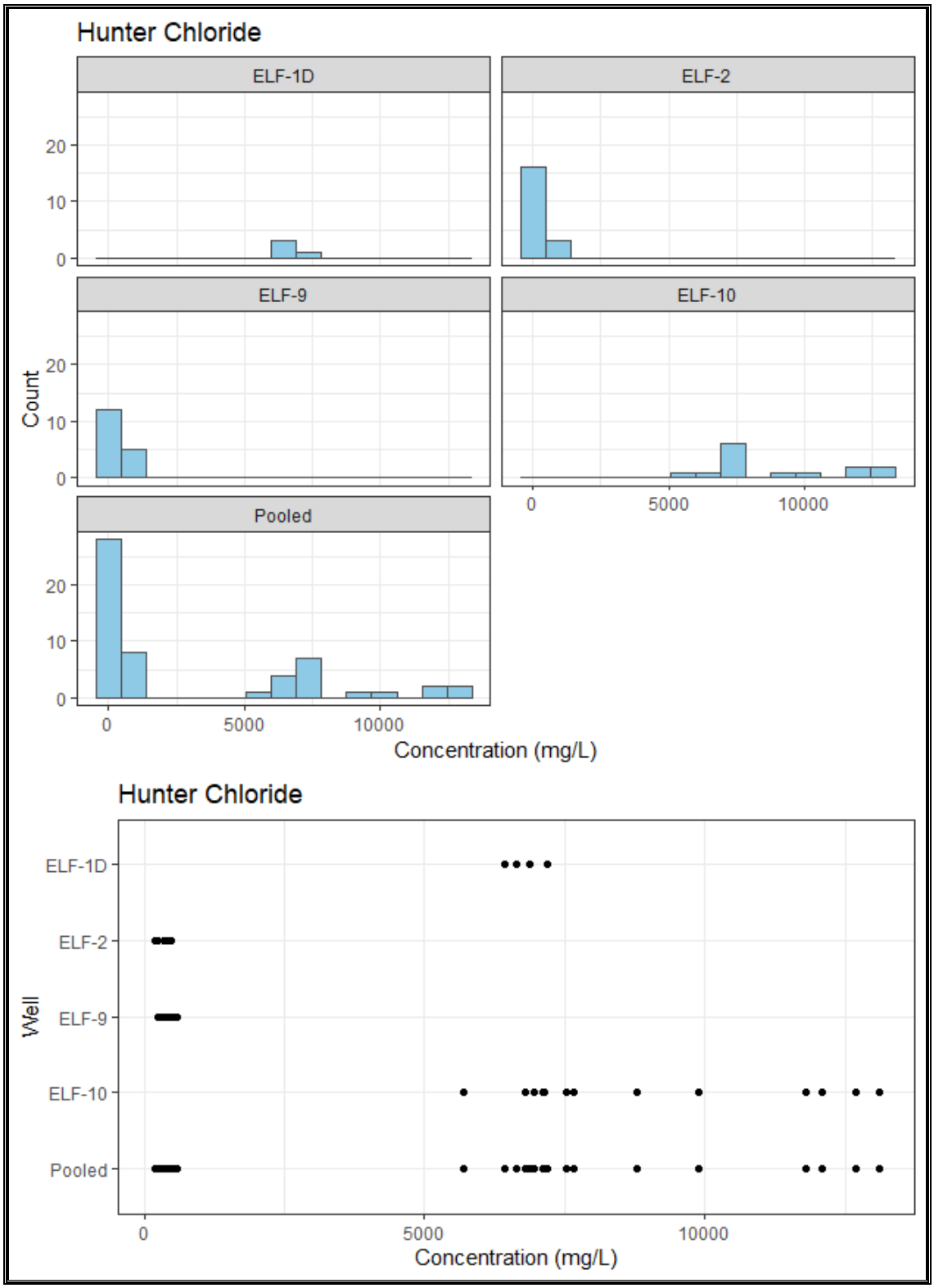

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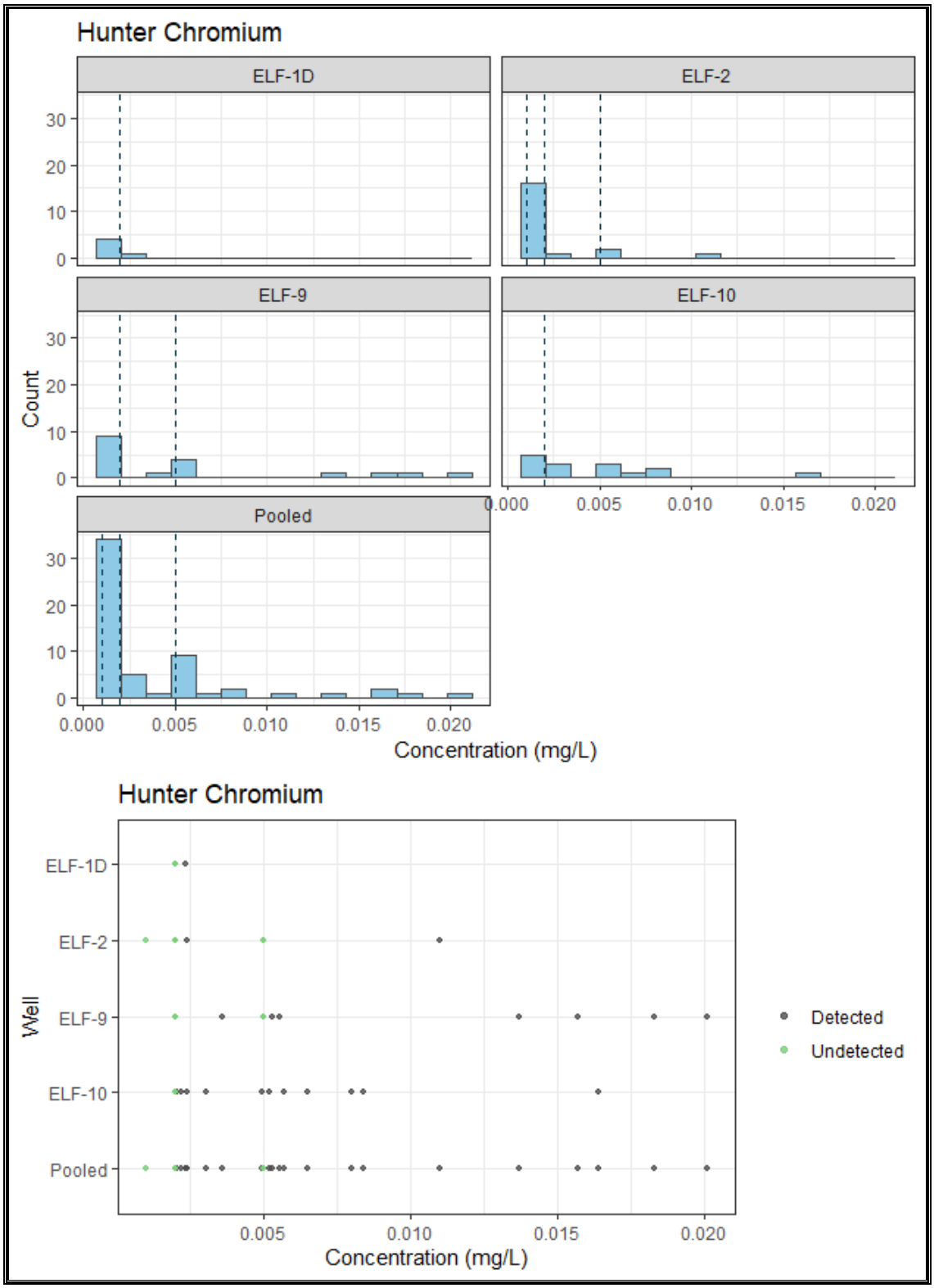

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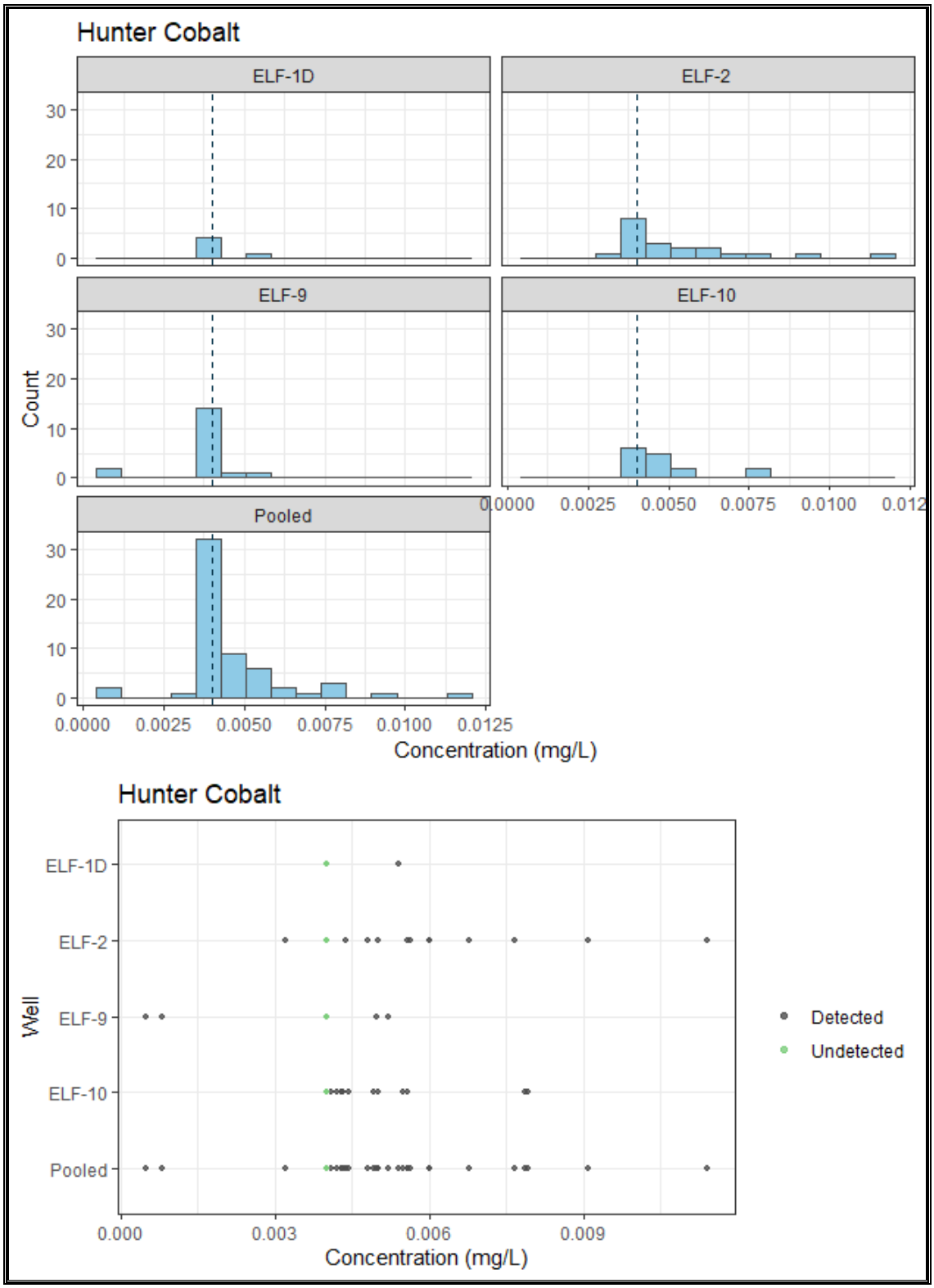

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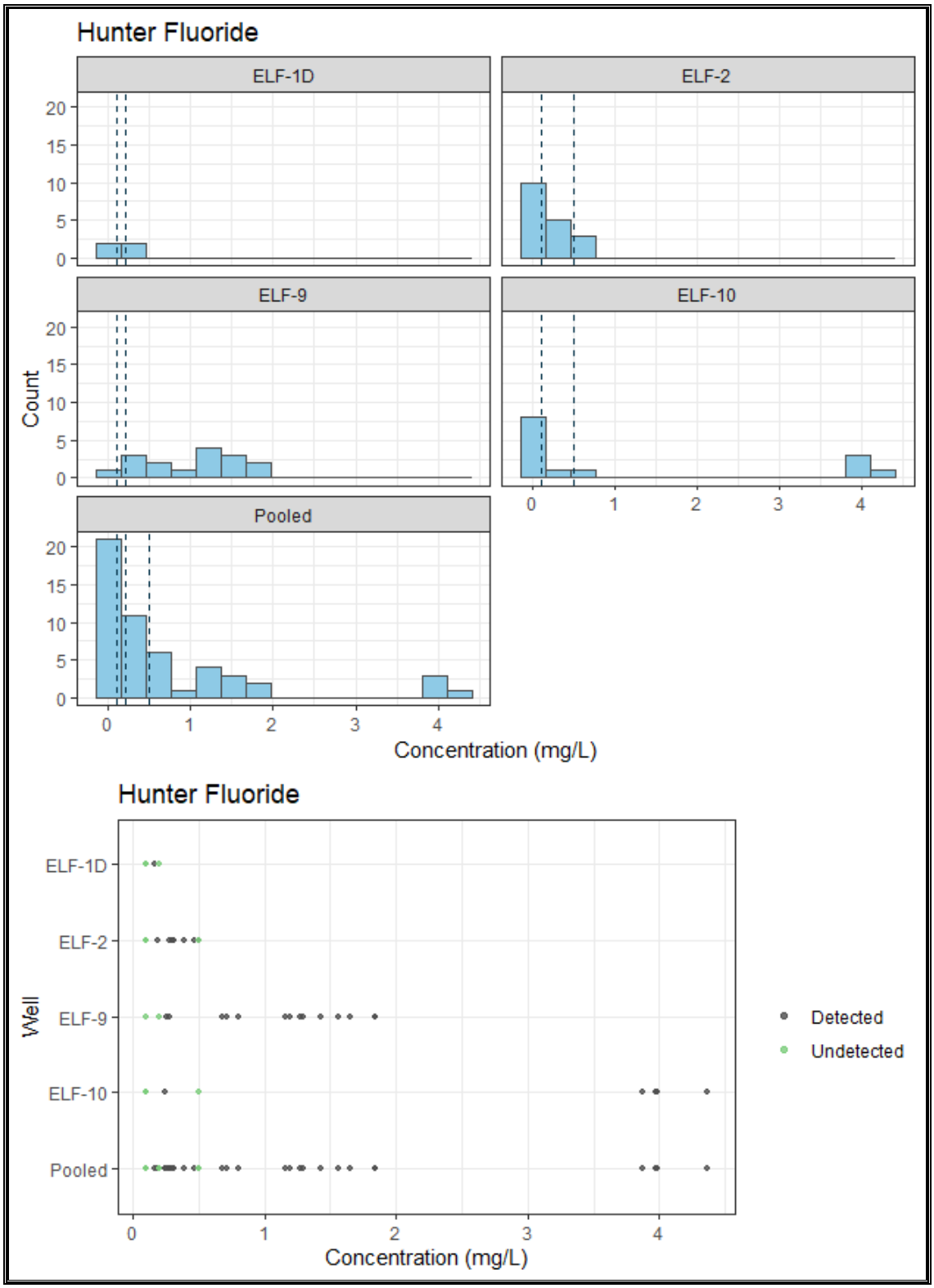

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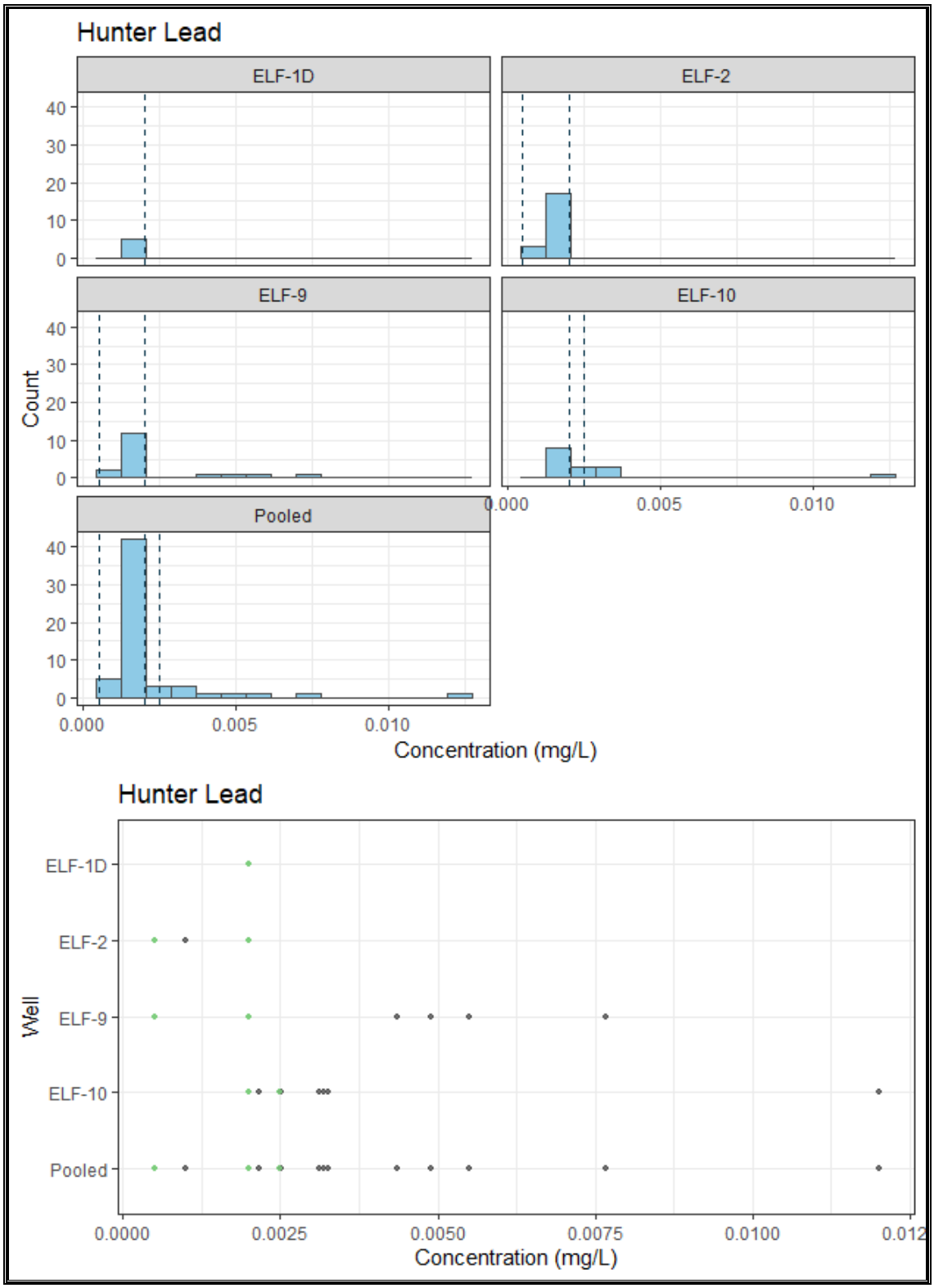

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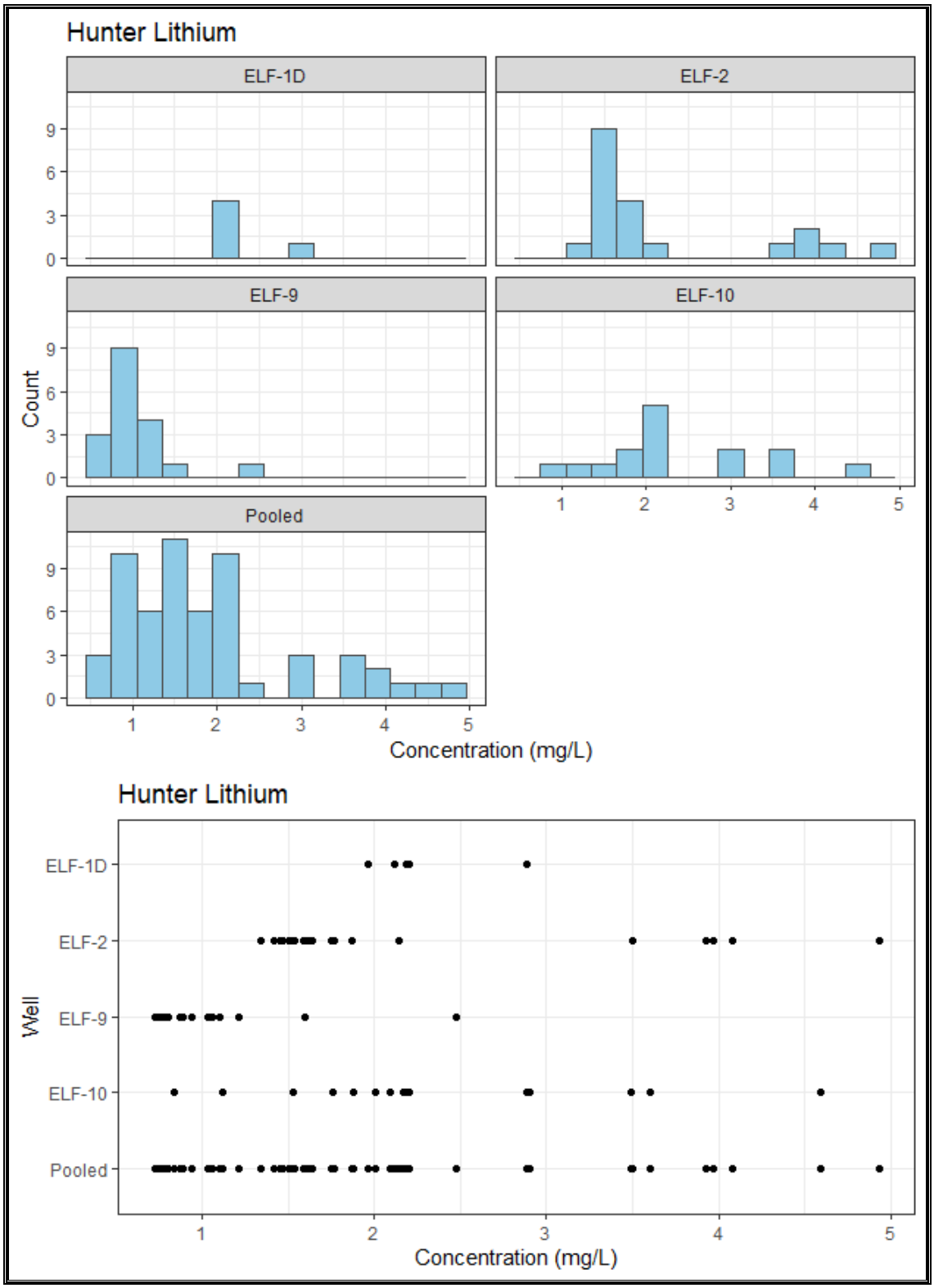

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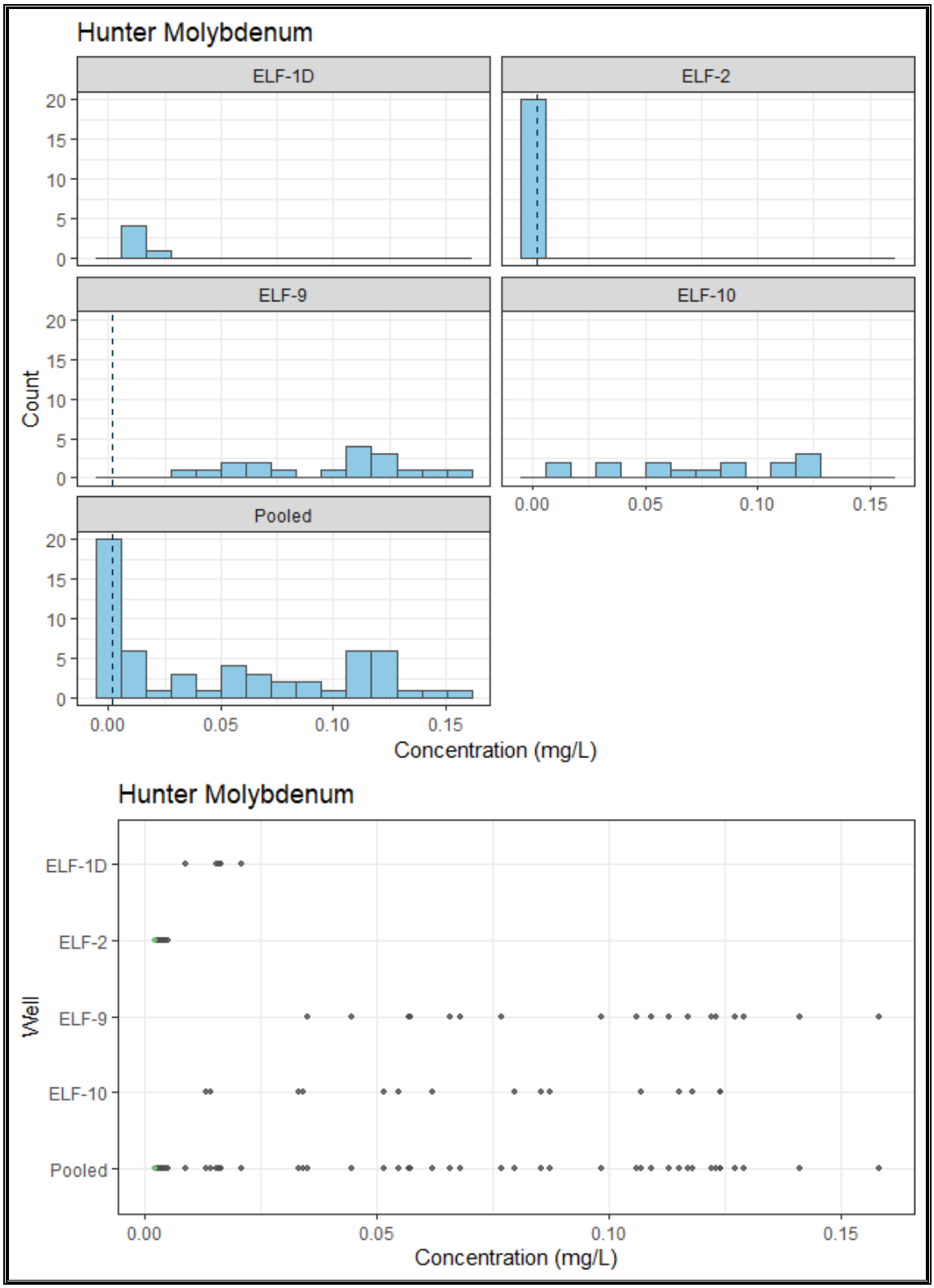

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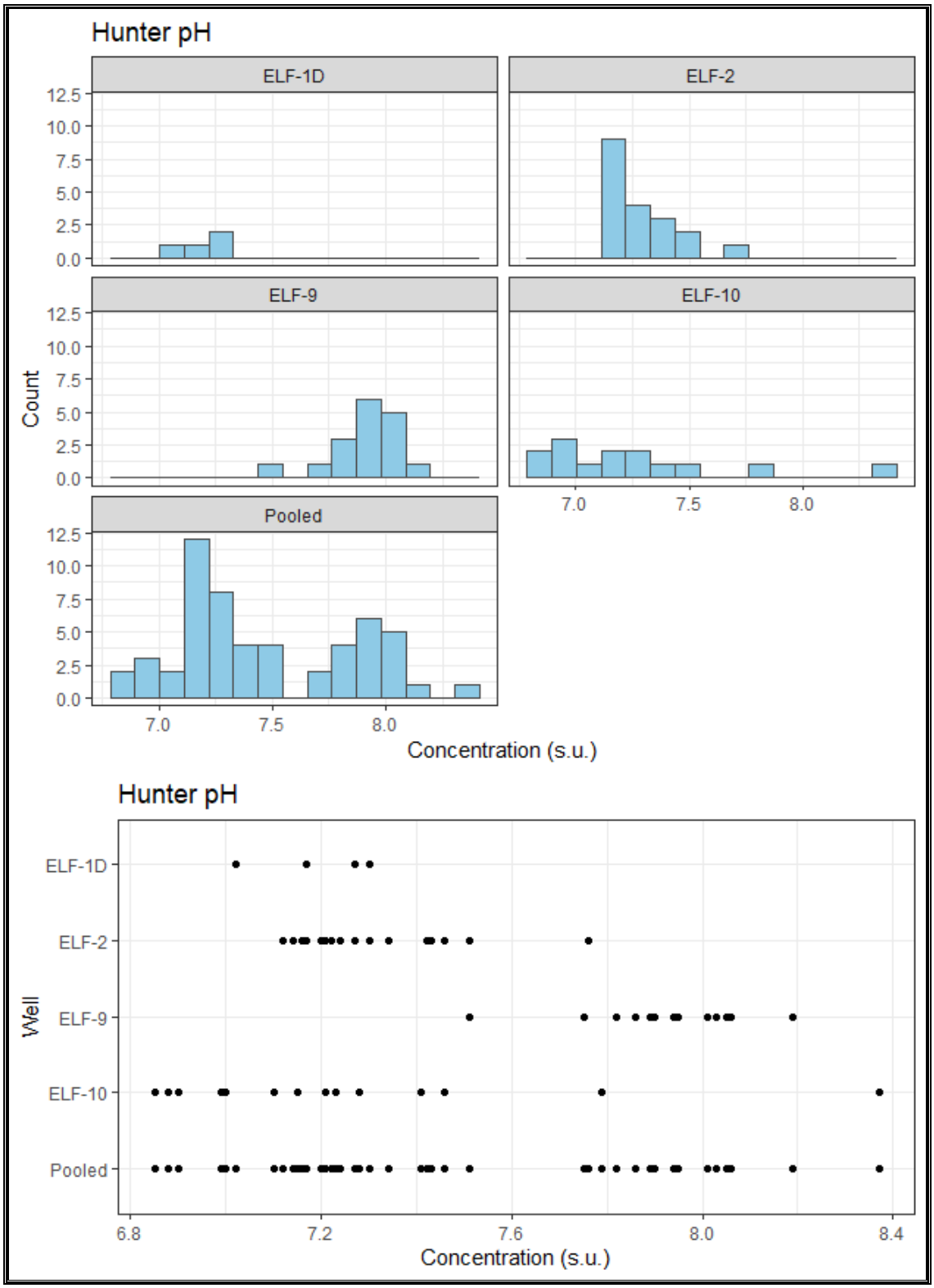

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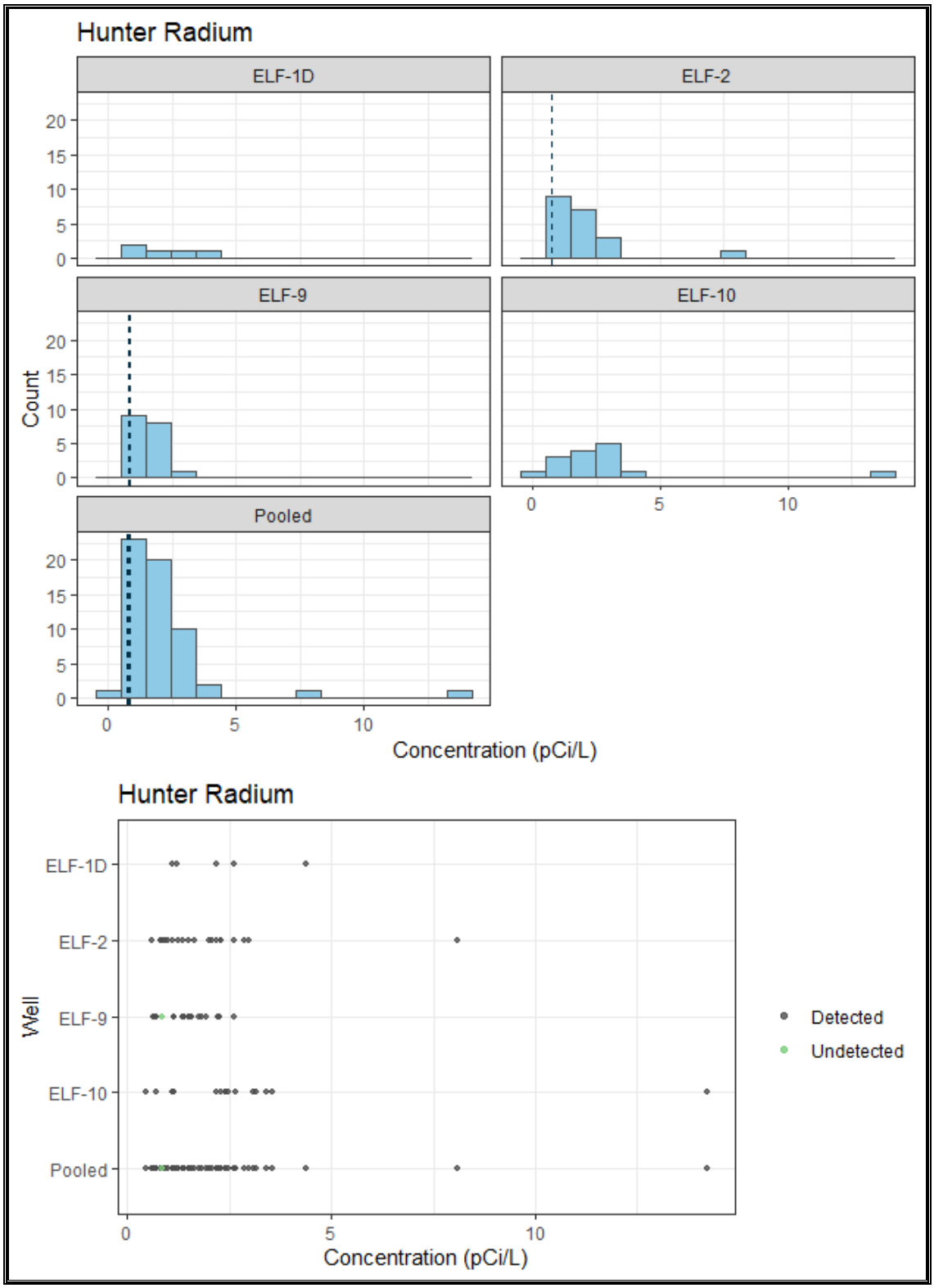

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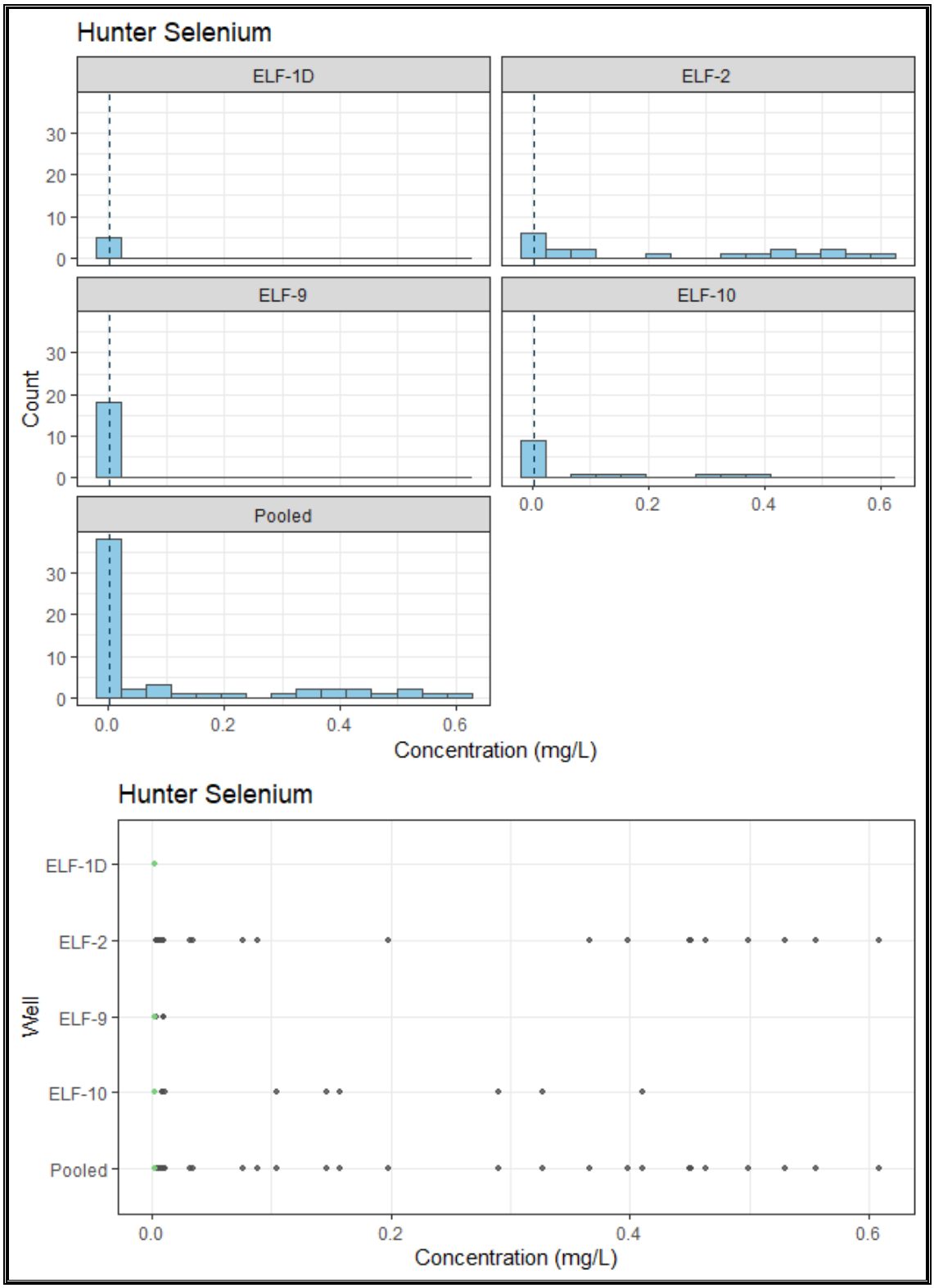

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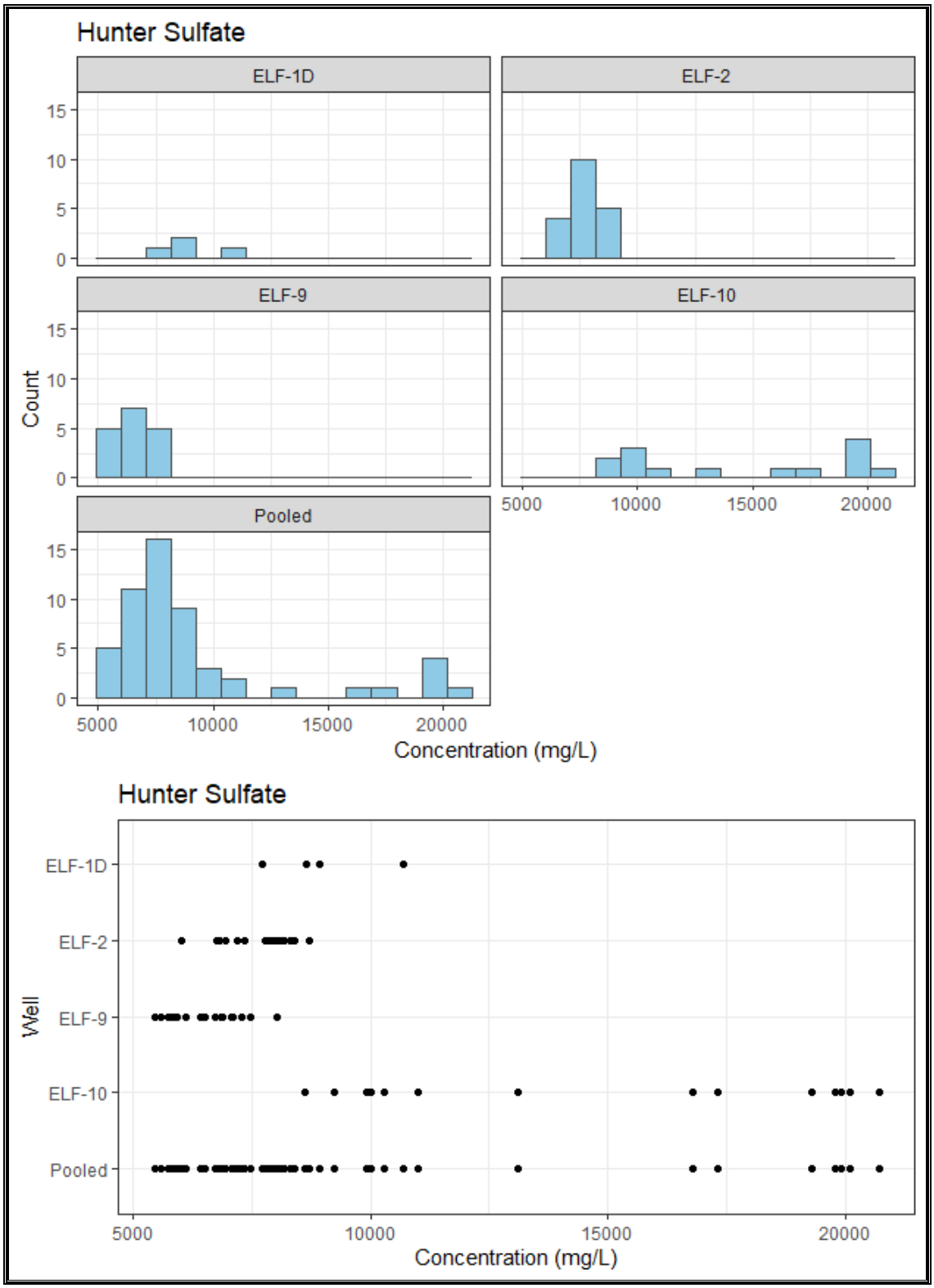

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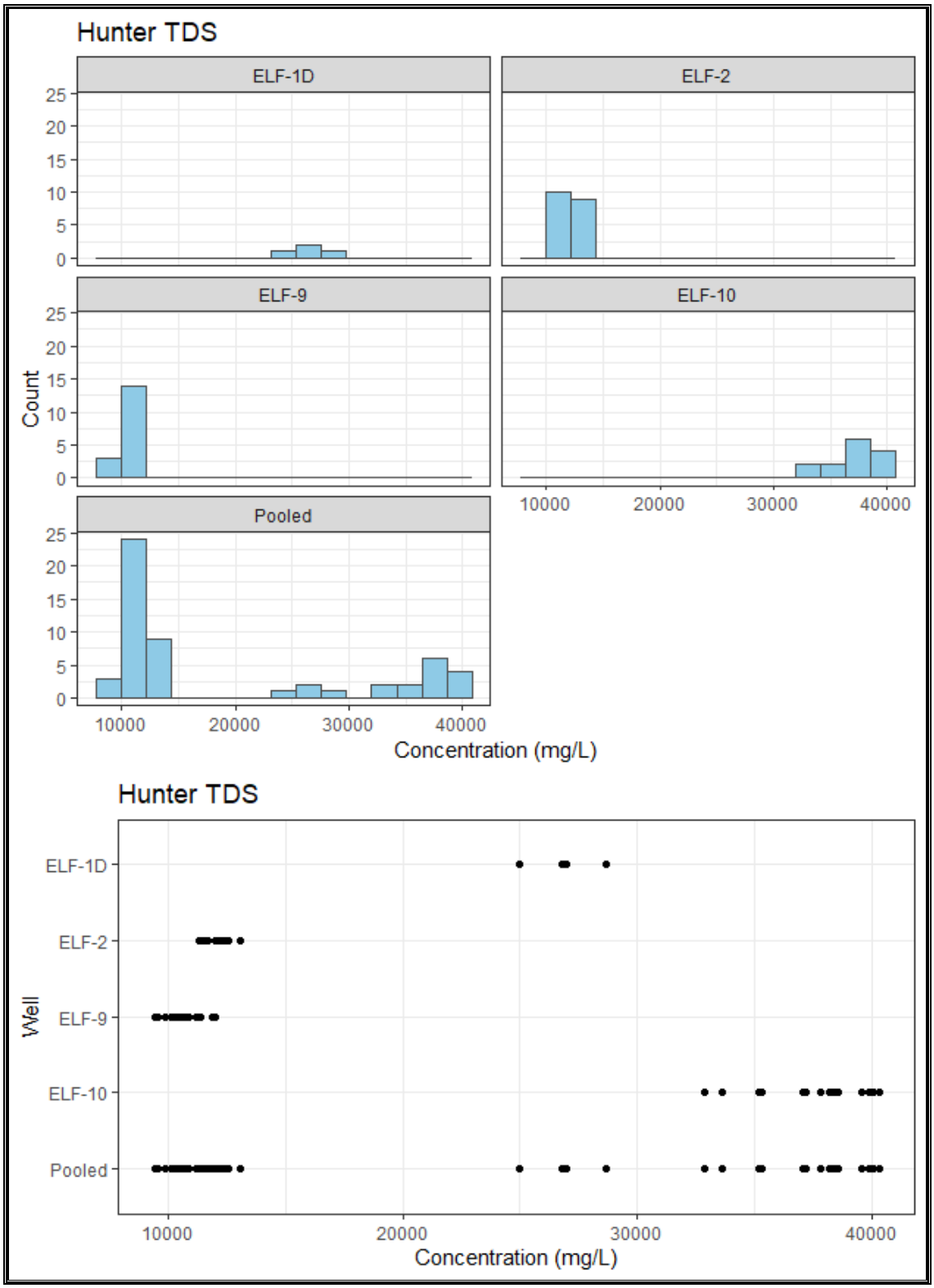

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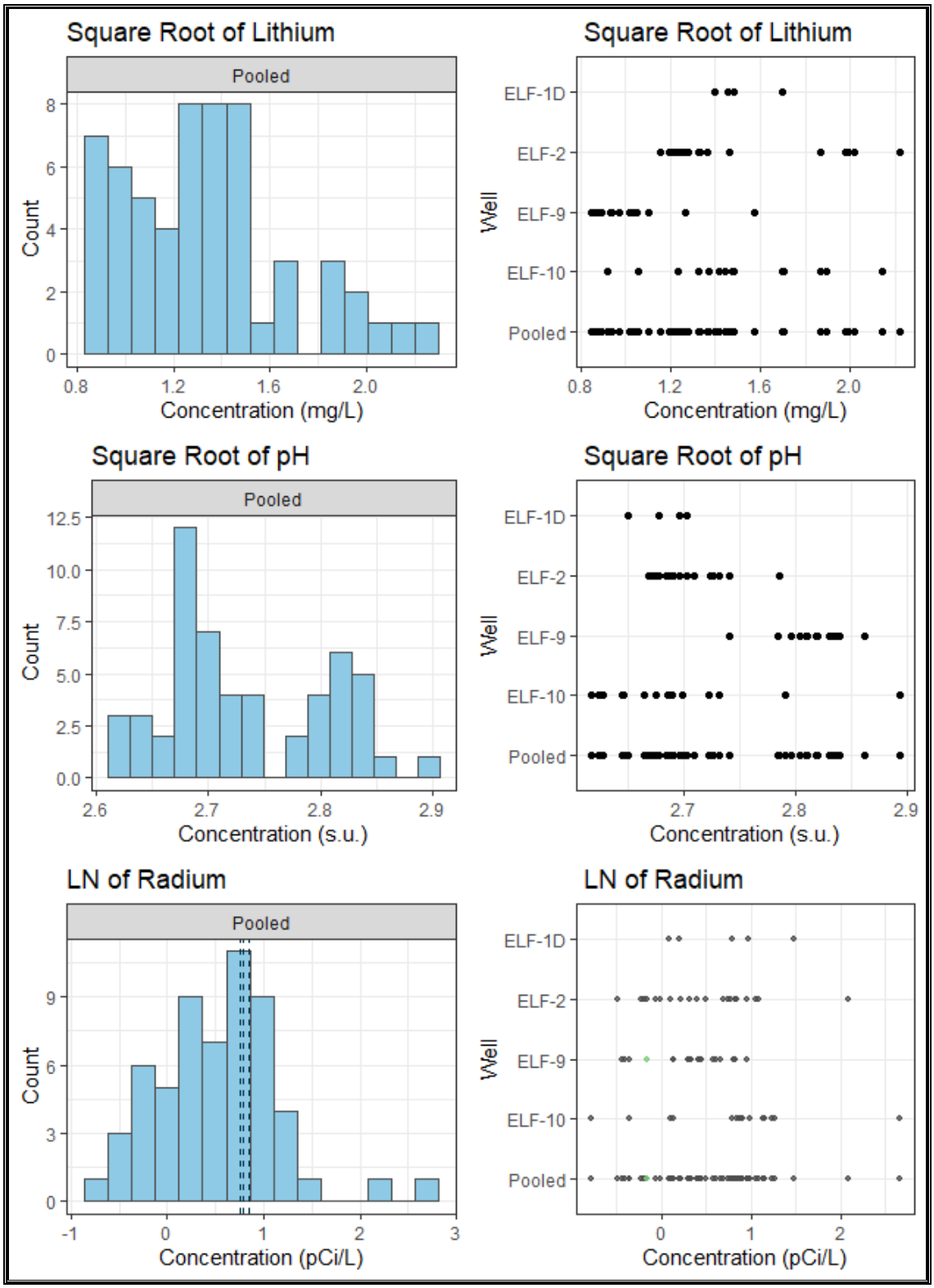

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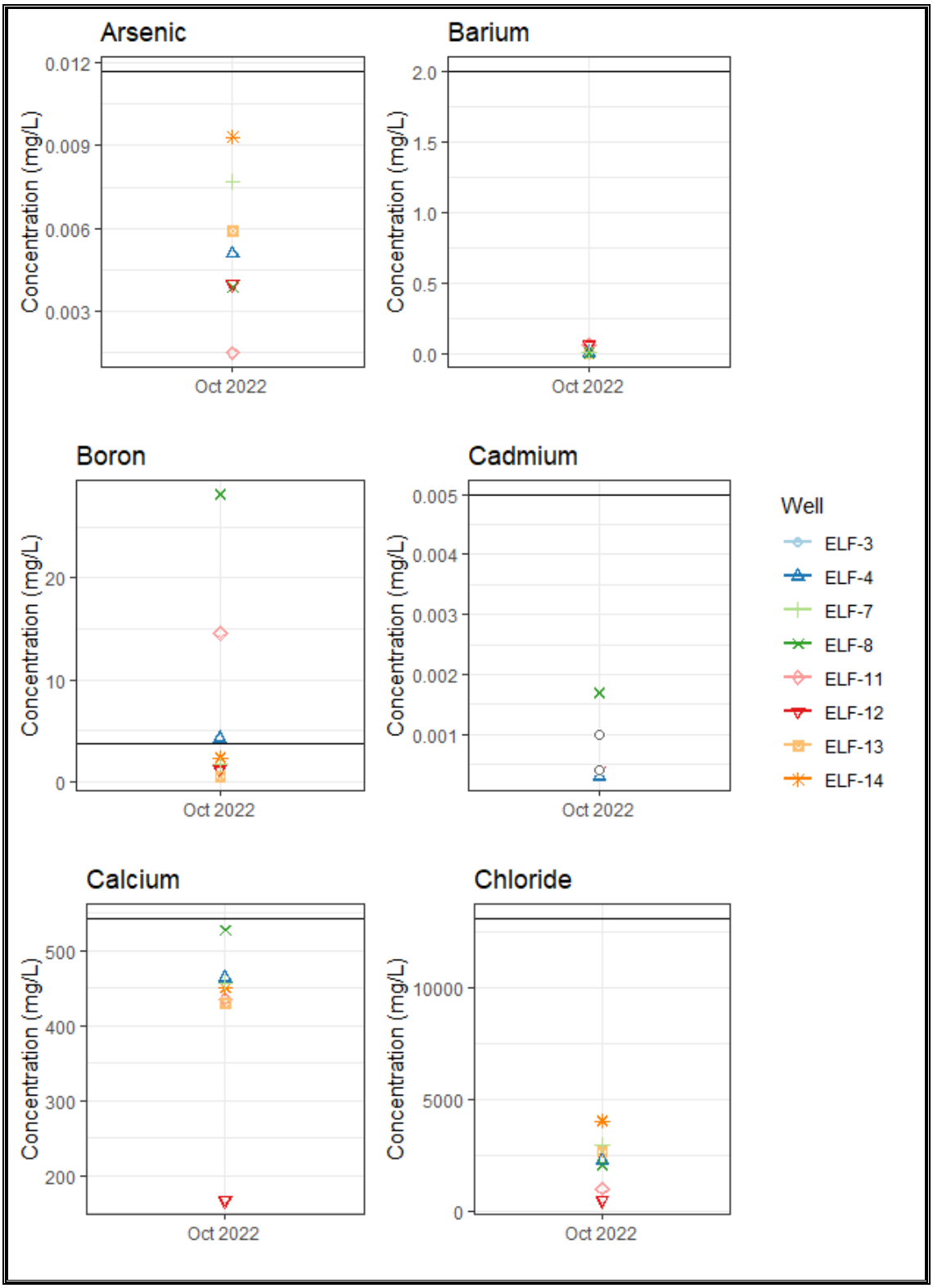
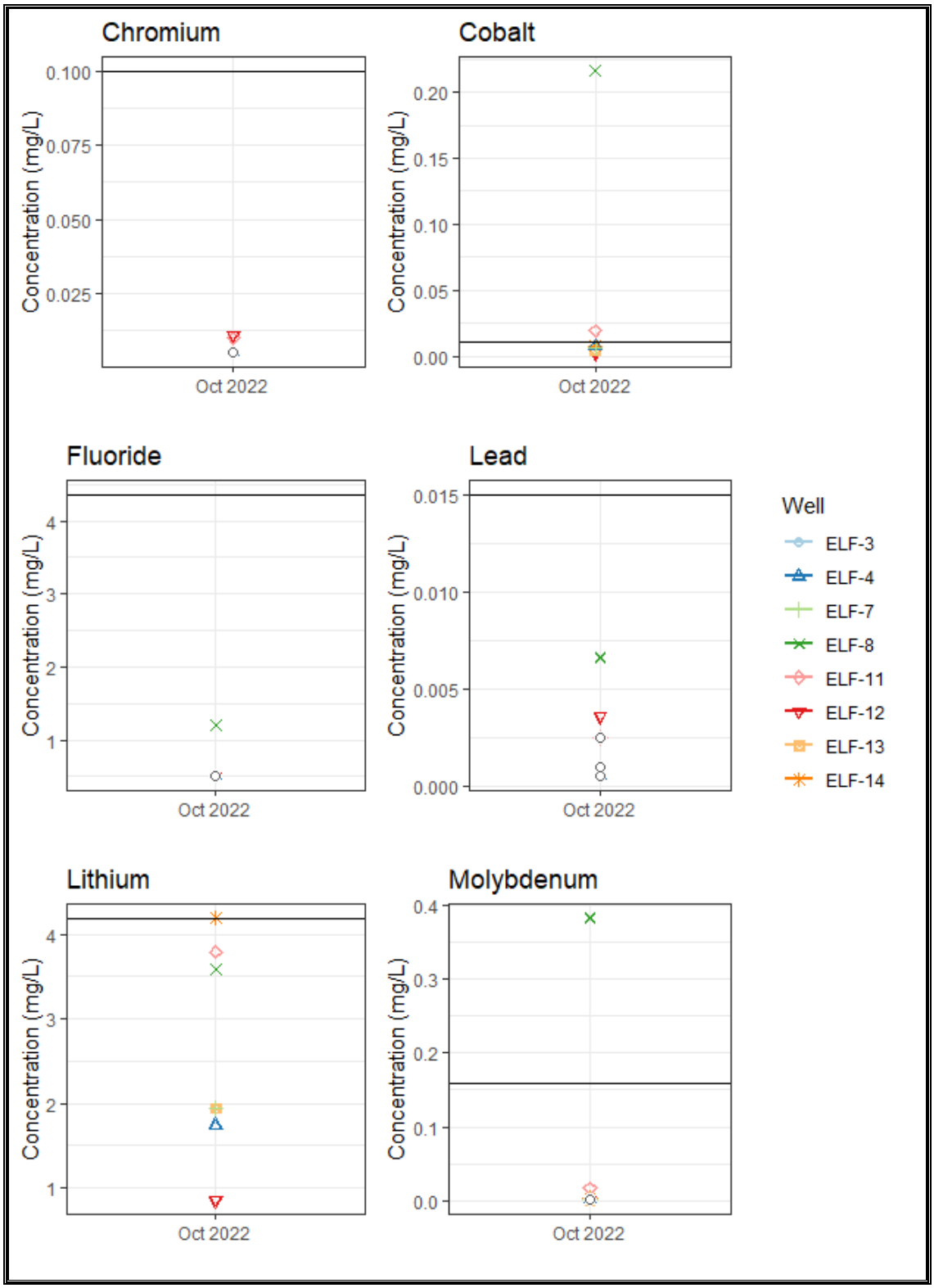


Figure C.4. Background upper tolerance limit plots for the CCR Landfill.



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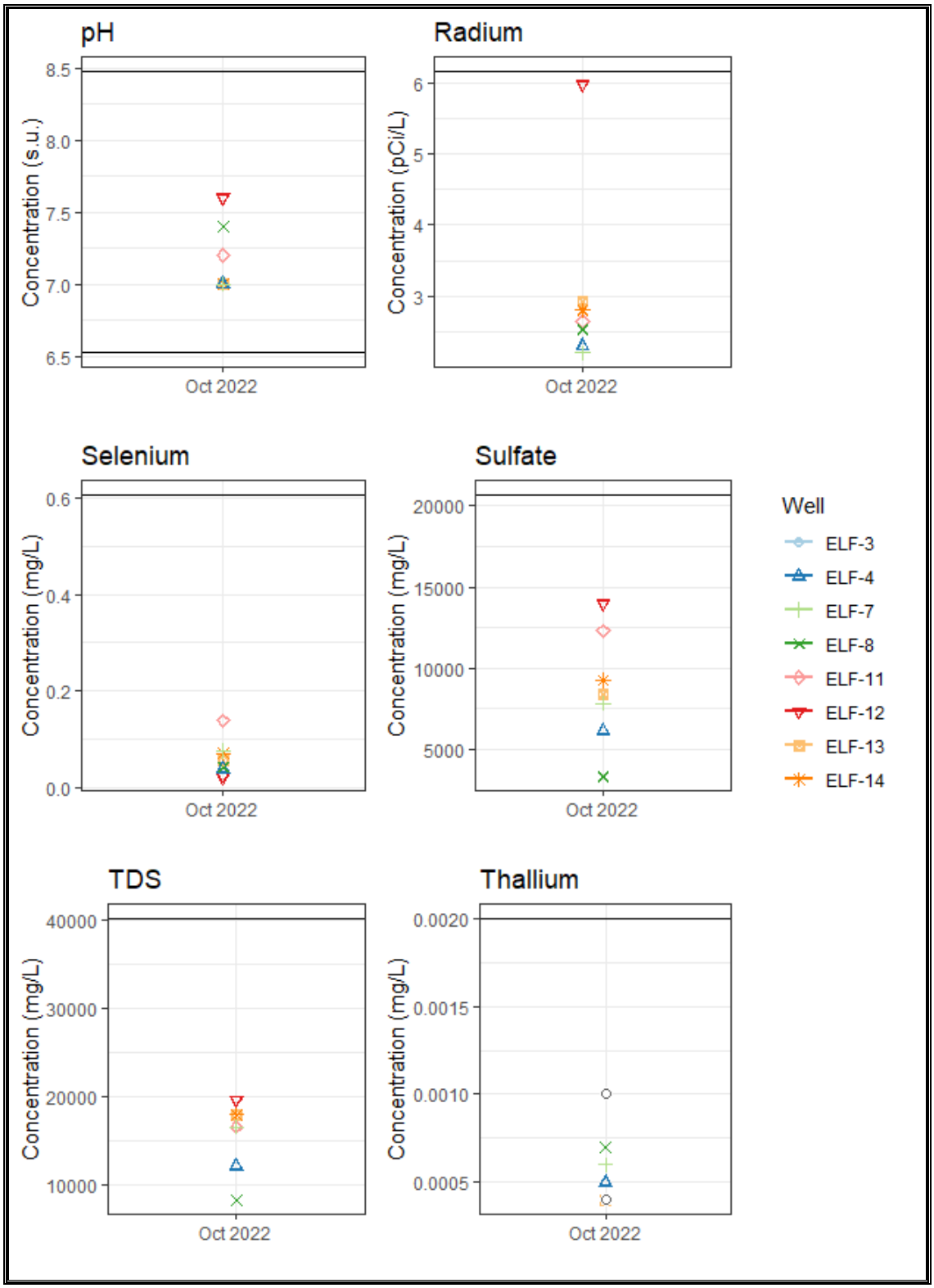

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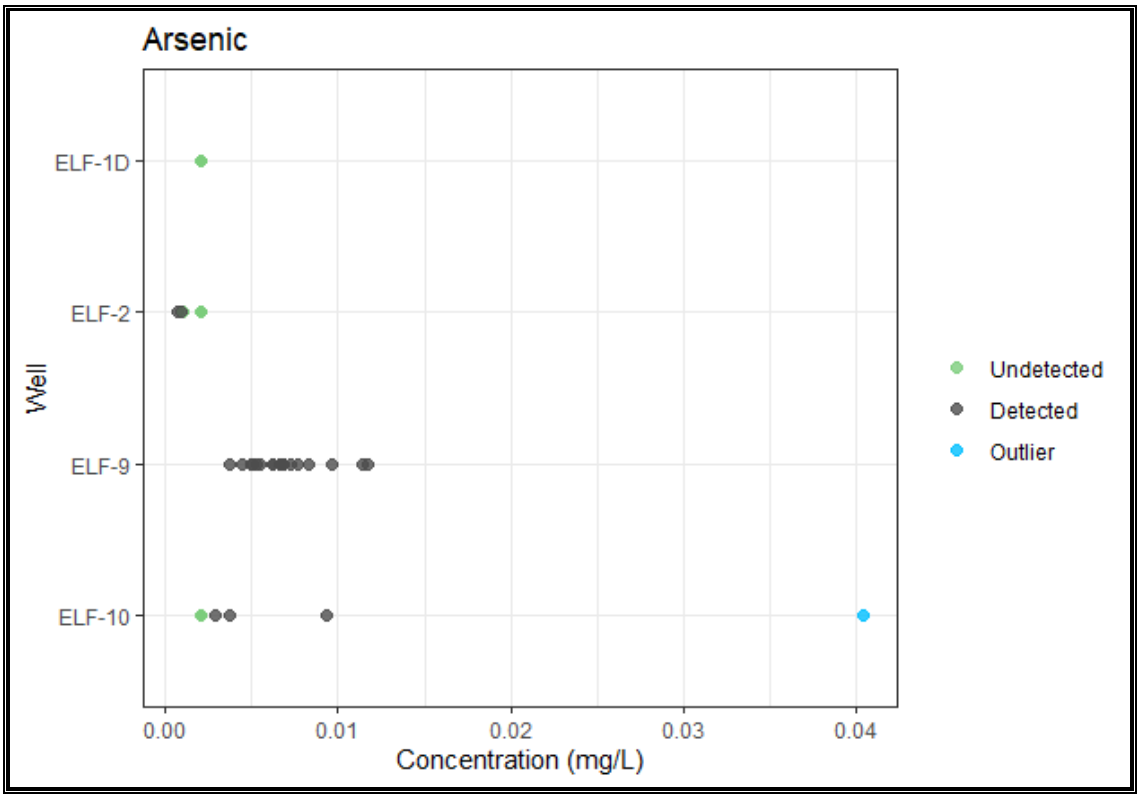

Figure C.5. Outlier plot for the Ash Landfill data.

Attachment D:

Field Data Sheets

Water & Environmental TECHNOLOGIES

Consulting Scientists and Engineers
480 East Park Street
Butte, Montana 59701
Phone: 406-782-5220
Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-1D
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV	**Depth to Water (ft.)**	82.78
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Not enough water to sample

Water & Environmental TECHNOLOGIES

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Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-2
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	14:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	23.99
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	13.6	14	1.39	7.12	8	2
10	13.4	13.8	1.00	7.07	7.9	0
15	13.4	13.8	0.96	7.07	7.9	0
20	13.4	13.8	0.91	7.07	7.9	0
25	13.3	13.8	0.83	7.06	7.9	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

4th and 5th parameter readings: dtw below top of pump.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-3
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV	**Depth to Water (ft.)**	33.57
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Not enough water to sample

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-4
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 26, 2022
Decon Method	Dedicated Equipment	**Sample Time**	17:30
Sampler(s) Initials	DV	**Depth to Water (ft.)**	18.51
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	13.1	15.3	1.50	6.96	8.8	68.4
10	3.2	15.3	0.91	6.95	8.8	32.8
15	13.2	15.3	0.82	6.93	8.8	20.9
20	13.1	15.3	0.79	6.93	8.8	19.2

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-5R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	16:25
Sampler(s) Initials	DV	**Depth to Water (ft.)**	21.48
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	12.9	23.4	1.03	7.32	13.9	
10	13.0	22.2	0.77	7.19	13.1	
15	13.1	21.9	0.72	7.12	13	428
20	13.0	21.8	0.66	7.11	12.9	323
25	13.0	21.8	0.62	7.12	12.9	301
30	13.1	21.8	0.59	7.10	12.9	300

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-6R
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	15:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	20.51
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	13.0	32.9	1.05	7.39	20.3	190
10	12.8	32.9	0.96	7.37	20.2	182
15	12.9	32.3	0.89	7.34	19.6	179
20	12.8	31.4	0.81	7.31	19.1	176
25	12.8	31	0.77	7.30	18.9	174
30	12.8	30.9	0.72	7.30	18.9	172

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Duplicate taken @ 0:00

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-7
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 26, 2022
Decon Method	Dedicated Equipment	**Sample Time**	18:15
Sampler(s) Initials	DV	**Depth to Water (ft.)**	16.90
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	13.6	20.2	2.16	6.95	11.9	327
10	13.9	19.8	2.37	6.94	11.8	210
15	14.0	20	2.19	6.92	11.8	221
20	14.0	19.9	2.25	6.92	11.7	89.5
25	13.9	19.8	2.29	6.91	11.7	86.3

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-8
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 26, 2022
Decon Method	Dedicated Equipment	**Sample Time**	14:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	9.22
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	14.9	11.5	7.64	7.41	6.5	127
10	14.9	11.4	6.86	7.40	6.4	42.6
15	15.0	11.3	6.37	7.42	6.4	11.5
20	15.0	11.3	6.11	7.43	6.4	2.1
25	15.0	11.3	6.01	7.43	6.4	0.4
30	15.0	11.3	5.98	7.44	6.4	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-9
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	12:30
Sampler(s) Initials	DV	**Depth to Water (ft.)**	22.92
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	12.8	14.6	1.07	7.78	8.3	7.6
10	12.6	14	0.69	7.84	8	0
15	12.6	13.9	0.66	7.86	7.9	0
20	12.5	13.7	0.62	7.84	7.8	0
25	12.5	13.4	0.61	7.82	7.6	0
30	12.5	13	0.64	7.79	7.3	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-10
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	11:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	48.50
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	12.5	47.1	7.22	6.78	30	161
10	12.4	47.1	6.76	6.79	30	112
15	12.9	47.1	5.77	6.80	30.1	147

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Did not follow low flow procedure to collect water. Well was going dry. Only collected partial bottles.

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-11
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 26, 2022
Decon Method	Dedicated Equipment	**Sample Time**	13:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	28.11
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	13.3	21.3	3.00	7.35	12.6	
10	13.3	21.2	3.02	7.24	12.6	171
15	13.3	21.2	1.63	7.22	12.5	141
20	13.3	21.3	1.39	7.18	12.6	136
25	13.3	21.3	1.28	7.17	12.7	132
30	13.3	21.4	1.21	7.17	12.7	126

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-12
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	10:00
Sampler(s) Initials	DV	**Depth to Water (ft.)**	21.25
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	12.3	22.1	1.24	7.48	13.1	348
10	12.3	22.1	1.03	7.45	22.1	386
15	12.5	22.2	0.96	7.45	13.2	307
20	12.5	22.2	0.89	7.45	13.2	184
25	12.5	22.2	0.79	7.45	13.2	189
30	12.5	22.2	0.77	7.45	13.2	181

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Bladder pump not working after several attempts, used 12 volt at low flow

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-13
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 26, 2022
Decon Method	Dedicated Equipment	**Sample Time**	16:55
Sampler(s) Initials	DV	**Depth to Water (ft.)**	4.87
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	12.4	20.7	1.26	7.00	12.2	2
10	12.4	20.7	0.81	6.96	12.2	0
15	12.3	20.7	0.71	6.95	12.2	0
20	12.3	20.7	0.69	6.94	12.2	0

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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Fax: 406-723-1537

GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-14
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 26, 2022
Decon Method	Dedicated Equipment	**Sample Time**	15:50
Sampler(s) Initials	DV	**Depth to Water (ft.)**	7.22
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	14.6	23.3	1.39	7.13	14	313
10	14.6	23.3	1.01	7.13	14	107
15	14.7	23.4	0.75	7.09	14	50.3
20	14.6	23.4	0.74	7.09	14	21.7
25	14.6	23.4	0.99	7.09	14	23.6

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-15
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	18:00
Sampler(s) Initials	DV	**Depth to Water (ft.)**	8.35
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	11.4	21.4	1.12	7.05	12.6	76.3
10	11.4	21.4	0.81	7.00	12.6	22.6
15	11.4	21.4	0.78	6.99	12.6	9.1
20	11.3	21.4	0.69	6.98	12.6	11.6
25	11.3	21.4	0.63	6.98	12.6	11.1

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-16
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 27, 2022
Decon Method	Dedicated Equipment	**Sample Time**	17:15
Sampler(s) Initials	DV	**Depth to Water (ft.)**	14.94
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)
5	12.8	25.9	0.94	7.28	15.6	70.3
10	13.1	25.6	0.88	7.25	15.2	68.9
15	13.5	23.8	0.93	7.14	14.2	64.2
20	13.8	23.6	0.79	7.10	14.1	31
25	13.8	23.6	0.71	7.09	14.2	31.9

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE — **Not Applicable**

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Group B Blank 1 @ 1715

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GROUNDWATER SAMPLING FORM

Project Name	Hunter Power Plant	**Project Location**	Castle Dale UT
Job number(s)	PAC-HTRCCR-M052	**Sample ID**	ELF-17
Sampling Method	Low Flow Bladder Pump	**Sample Date**	October 26, 2022
Decon Method	Dedicated Equipment	**Sample Time**	
Sampler(s) Initials	DV	**Depth to Water (ft.)**	
Field Conditions	NA		

FIELD PARAMETERS

TIME (min)	WATER TEMP (C)	SC (uS)	DO (mg/l)	pH (s.u.)	ORP (mv)	TURBIDITY (NTU)

SAMPLE COLLECTION

APPENDIX FOR CURRENT SAMPLE

APPENDIX	CONTAINERS	PRESERVATIVES	ANALYTES/COMMENTS
3&4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
3&4	(1) 250 mL poly	HNO3	Total metals, Total mercury
3&4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3&4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
3	(1) 250 mL poly	HNO3	Total metals
3	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
3	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity
4	(1) 1/2 gal poly	HNO3	Radium 226 + 228
4	(1) 250 mL poly	HNO3	Total metals, Total mercury
4	(1) 250 mL poly	H2SO4	Nitrate + Nitrite
4	(1) 1-L poly	None	TDS, pH, anions, fluoride, alkalinity

COMMENTS/OBSERVATIONS

Well is dry, no sample

Attachment E:

Laboratory Analytical Reports

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11/17/2022

Work Order: 22J2269
Project: Hunter Power Plant CCR

Pacificorp - Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

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.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Melissa Connolly, Project Manager

Pacificorp - Environmental Remediation
Project: Hunter Power Plant CCR
Project Manager: Brad Giles

Laboratory ID	Sample Name
22J2269-01	ELF-2
22J2269-02	ELF-4
22J2269-03	ELF-5R
22J2269-04	ELF-6R
22J2269-05	ELF-7
22J2269-06	ELF-8
22J2269-07	ELF-9
22J2269-08	ELF-10
22J2269-09	ELF-11
22J2269-10	ELF-12
22J2269-11	ELF-13
22J2269-12	ELF-14
22J2269-13	ELF-15
22J2269-14	ELF-16
22J2269-15	Duplicate - (CCR)
22J2269-16	Field Blank - (CCR)

Work Order Report Narrative

Sample Preparation
All samples were prepared within method specified holding times. No preparation issues were noted.

Method Blanks
All blank values were within method acceptance criteria. No blank values exceeded the minimum reporting limit for any analysis in this work order.

Laboratory Control Samples
All laboratory control samples were within method acceptance criteria.

Method Spikes
All method spike recoveries were within method acceptance criteria, except as noted by qualifying flags.

Method Spike Duplicates
All method spike duplicates were within method acceptance criteria, except as noted by qualifying flags.

Corrective Actions
There are no corrective actions associated with this work order.

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Castle Dale, UT 84513

PO#:
Receipt: **10/28/22 13:00 @ 2.1** °C
Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **22J2269-01**
Date Sampled: **10/27/22 14:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	222	mg/L	5.00	EPA 300.0	10/31/22	10/31/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.2	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:44	SPH
Sulfate	8070	mg/L	100	EPA 300.0	11/1/22	11/2/22	
Total Dissolved Solids (TDS)	13100	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0007	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Boron, Total	2.94	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	385	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0032	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	1.64	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0024	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0084	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-4**

Matrix: **Water**
Lab ID: **22J2269-02**
Date Sampled: **10/26/22 17:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2260	mg/L	100	EPA 300.0	11/1/22	11/2/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:46	SPH
Sulfate	6140	mg/L	100	EPA 300.0	11/1/22	11/2/22	
Total Dissolved Solids (TDS)	12100	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0051	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Boron, Total	4.28	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	0.0003	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	464	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0078	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	1.74	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0024	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0386	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-5R**

Matrix: **Water**
Lab ID: **22J2269-03**
Date Sampled: **10/27/22 16:25**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3610	mg/L	100	EPA 300.0	11/1/22	11/2/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:47	SPH
Sulfate	8740	mg/L	100	EPA 300.0	11/1/22	11/2/22	
Total Dissolved Solids (TDS)	22600	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0078	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.017	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Boron, Total	4.45	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	456	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0043	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	3.81	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0048	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0776	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	0.0005	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-6R**

Matrix: **Water**
Lab ID: **22J2269-04**
Date Sampled: **10/27/22 15:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3920	mg/L	100	EPA 300.0	11/1/22	11/2/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.2	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:48	SPH
Sulfate	14200	mg/L	500	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	26100	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0094	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Boron, Total	2.78	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	404	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0052	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	2.82	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0017	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.125	mg/L	0.0050	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-7**

Matrix: **Water**
Lab ID: **22J2269-05**
Date Sampled: **10/26/22 18:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2940	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:50	SPH
Sulfate	7850	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	16500	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0077	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.011	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Boron, Total	1.64	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	457	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0062	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	1.94	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0022	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0752	mg/L	0.0050	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	0.0006	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-8**

Matrix: **Water**
Lab ID: **22J2269-06**
Date Sampled: **10/26/22 14:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2030	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Fluoride	1.20	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.4	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:54	SPH
Sulfate	3340	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	8180	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0039	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Boron, Total	28.2	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	0.0017	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	527	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.216	mg/L	0.0050	EPA 200.8	10/31/22	11/2/22	
Lead, Total	0.0066	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	3.58	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.382	mg/L	0.0050	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0414	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	0.0007	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-9**

Matrix: **Water**
Lab ID: **22J2269-07**
Date Sampled: **10/27/22 12:30**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	244	mg/L	5.00	EPA 300.0	10/31/22	10/31/22	
Fluoride	0.678	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.9	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:55	SPH
Sulfate	6130	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	9560	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	0.0006	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0037	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.013	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Boron, Total	1.16	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	125	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0008	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	1.04	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0351	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0093	mg/L	0.0005	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	10/31/22	11/2/22	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-10**

Matrix: **Water**
Lab ID: **22J2269-08**
Date Sampled: **10/27/22 11:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	12700	mg/L	500	EPA 300.0	11/15/22	11/16/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	6.9	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:57	SPH
Sulfate	11000	mg/L	500	EPA 300.0	11/15/22	11/16/22	
Total Dissolved Solids (TDS)	37100	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0025	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0404	mg/L	0.0025	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.038	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0025	EPA 200.8	10/31/22	11/2/22	
Boron, Total	1.39	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	525	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	0.008	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0050	mg/L	0.0025	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0025	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	2.01	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0131	mg/L	0.0025	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.327	mg/L	0.0050	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-11**

Matrix: **Water**
Lab ID: **22J2269-09**
Date Sampled: **10/26/22 13:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	989	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	10/31/22	
pH	7.2	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:58	SPH
Sulfate	12300	mg/L	500	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	16500	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0015	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.071	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Boron, Total	14.6	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	435	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	0.010	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0193	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lead, Total	0.0025	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	3.79	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0170	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.138	mg/L	0.0050	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-12**

Matrix: **Water**
Lab ID: **22J2269-10**
Date Sampled: **10/27/22 10:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	478	mg/L	5.00	EPA 300.0	10/31/22	11/1/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	11/1/22	
pH	7.6	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 15:59	SPH
Sulfate	14000	mg/L	500	EPA 300.0	11/7/22	11/7/22	
Total Dissolved Solids (TDS)	19600	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0040	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.067	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Boron, Total	1.18	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	167	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	0.011	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0027	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lead, Total	0.0036	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	0.858	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0221	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-13**

Matrix: **Water**
Lab ID: **22J2269-11**
Date Sampled: **10/26/22 16:55**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2640	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	11/1/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 16:01	SPH
Sulfate	8380	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	17900	mg/L	500	SM 2540 C	11/11/22	11/11/22	APH-R
Metals							
Antimony, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Arsenic, Total	0.0059	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Boron, Total	0.50	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	
Calcium, Total	430	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0050	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lead, Total	ND	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Lithium, Total	1.94	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/2/22	11/3/22	
Molybdenum, Total	0.0012	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Selenium, Total	0.0545	mg/L	0.0010	EPA 200.8	10/31/22	11/2/22	
Thallium, Total	0.0004	mg/L	0.0004	EPA 200.8	10/31/22	11/2/22	

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Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-14**

Matrix: **Water**
Lab ID: **22J2269-12**
Date Sampled: **10/26/22 15:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	4020	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	11/1/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 16:02	SPH
Sulfate	9260	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	17900	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Arsenic, Total	0.0093	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Boron, Total	2.34	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	
Calcium, Total	450	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0080	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lead, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lithium, Total	4.19	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/8/22	11/8/22	
Molybdenum, Total	0.0038	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Selenium, Total	0.0704	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Thallium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	

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Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-15**

Matrix: **Water**
Lab ID: **22J2269-13**
Date Sampled: **10/27/22 18:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	2750	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	11/1/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 16:04	SPH
Sulfate	9720	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	19900	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Arsenic, Total	0.0073	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Barium, Total	0.012	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Boron, Total	3.19	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	
Calcium, Total	437	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0047	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lead, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lithium, Total	2.48	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	0.00025	mg/L	0.00015	EPA 245.1	11/8/22	11/8/22	
Molybdenum, Total	0.0025	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Selenium, Total	0.0612	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Thallium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	

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Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **10/28/22 13:00 @ 2.1** °C
Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-16**

Matrix: **Water**
Lab ID: **22J2269-14**
Date Sampled: **10/27/22 17:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3600	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	11/1/22	
pH	7.0	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 16:05	SPH
Sulfate	9860	mg/L	100	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	18300	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Arsenic, Total	0.0091	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Barium, Total	0.030	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Boron, Total	7.82	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	
Calcium, Total	445	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0078	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lead, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lithium, Total	4.62	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/8/22	11/8/22	
Molybdenum, Total	0.0041	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Selenium, Total	0.0969	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Thallium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	

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PO#:
Receipt: **10/28/22 13:00 @ 2.1** °C
Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **Duplicate - (CCR)**

Matrix: **Water**
Lab ID: **22J2269-15**
Date Sampled: **10/27/22 0:00**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	3760	mg/L	500	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	10/31/22	11/1/22	
pH	7.2	pH Units	0.1	SM 4500 H-B	10/28/22 15:26	10/28/22 16:05	SPH
Sulfate	15200	mg/L	500	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	20700	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Arsenic, Total	0.0095	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Barium, Total	0.010	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Beryllium, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Boron, Total	2.85	mg/L	0.05	EPA 200.7	11/1/22	11/2/22	
Cadmium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	
Calcium, Total	419	mg/L	0.2	EPA 200.7	11/1/22	11/2/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Cobalt, Total	0.0055	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lead, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Lithium, Total	2.89	mg/L	0.005	EPA 200.7	11/1/22	11/2/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/8/22	11/8/22	
Molybdenum, Total	ND	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Selenium, Total	0.121	mg/L	0.0025	EPA 200.8	11/1/22	11/3/22	
Thallium, Total	ND	mg/L	0.0010	EPA 200.8	11/1/22	11/3/22	

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PO#:
Receipt: **10/28/22 13:00 @ 2.1** °C
Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **Field Blank - (CCR)**

Matrix: **Water**
Lab ID: **22J2269-16**
Date Sampled: **10/27/22 17:15**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Inorganic							
Chloride	ND	mg/L	1.00	EPA 300.0	11/3/22	11/4/22	
Fluoride	ND	mg/L	0.500	EPA 300.0	11/3/22	11/4/22	
pH	5.5	pH Units	0.1	SM 4500 H-B	10/28/22 16:14	10/28/22 16:40	SPH
Sulfate	ND	mg/L	1.00	EPA 300.0	11/3/22	11/4/22	
Total Dissolved Solids (TDS)	28500	mg/L	100	SM 2540 C	10/28/22	10/28/22	
Metals							
Antimony, Total	ND	mg/L	0.0005	EPA 200.8	11/1/22	11/1/22	
Arsenic, Total	ND	mg/L	0.0005	EPA 200.8	11/1/22	11/1/22	
Barium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/1/22	
Beryllium, Total	ND	mg/L	0.0005	EPA 200.8	11/1/22	11/1/22	
Boron, Total	ND	mg/L	0.05	EPA 200.7	11/1/22	11/1/22	
Cadmium, Total	ND	mg/L	0.0002	EPA 200.8	11/1/22	11/1/22	
Calcium, Total	ND	mg/L	0.2	EPA 200.7	11/1/22	11/1/22	
Chromium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/1/22	
Cobalt, Total	ND	mg/L	0.0005	EPA 200.8	11/1/22	11/1/22	
Lead, Total	ND	mg/L	0.0005	EPA 200.8	11/1/22	11/1/22	
Lithium, Total	ND	mg/L	0.005	EPA 200.7	11/1/22	11/1/22	
Mercury, Total	ND	mg/L	0.00015	EPA 245.1	11/8/22	11/8/22	
Molybdenum, Total	ND	mg/L	0.0005	EPA 200.8	11/1/22	11/1/22	
Selenium, Total	ND	mg/L	0.0005	EPA 200.8	11/1/22	11/1/22	
Thallium, Total	ND	mg/L	0.0002	EPA 200.8	11/1/22	11/1/22	

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Castle Dale, UT 84513

PO#:
Receipt: **10/28/22 13:00 @ 2.1** °C
Date Reported: 11/17/2022
Project Name: **Hunter Power Plant CCR**

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-R = This sample was originally analyzed within the EPA-recommended holding time. The reported value was obtained from a confirmatory re-analysis that was performed outside of that holding time.
SPH = Sample submitted past method specified holding time.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

*RADS on 22J2268

22J2269 1 of 2

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)~~ Wallkin
( ) Temperature Blank
(✓) Received within Hold
Checked by: MR

01-16
AQ 1233
M 1207

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																	Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0			*	Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
	1. ~~ELF-1D~~			W		4	x	x	x	x	x	x	x	x				x									
01	2. ELF-2	10/27/2022	14:50	W		4	x	x	x	x	x	x	x	x				x									
	3. ~~ELF-3~~			W		4	x	x	x	x	x	x	x	x				x									
02	4. ELF-4	10/26/2022	17:30	W		4	x	x	x	x	x	x	x	x				x									
03	5. ELF-5R	10/27/2022	16:25	W		4	x	x	x	x	x	x	x	x				x									
04	6. ELF-6R	10/27/2022	15:50	W		4	x	x	x	x	x	x	x	x				x									
05	7. ELF-7	10/26/2022	18:15	W		4	x	x	x	x	x	x	x	x				x									
06	8. ELF-8	10/26/2022	14:50	W		4	x	x	x	x	x	x	x	x				x									
07	9. ELF-9	10/27/2022	12:30	W		4	x	x	x	x	x	x	x	x				x									
08	10. ELF-10	10/27/2022	11:50	W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 2.1

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

Special Instructions:

Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
	10/28/22 13:00		10/28/22 1300
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
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PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

22J2269 2of2

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																		Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)						Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
-09	1. ELF-11	10/26/2022	13:50	W		4	x	x	x	x	x	x	x	x				x									
-10	2. ELF-12	10/27/2022	10:00	W		4	x	x	x	x	x	x	x	x				x									
-11	3. ELF-13	10/26/2022	16:55	W		4	x	x	x	x	x	x	x	x				x									
-12	4. ELF-14	10/26/2022	15:50	W		4	x	x	x	x	x	x	x	x				x									
-13	5. ELF-15	10/27/2022	18:00	W		4	x	x	x	x	x	x	x	x				x									
-14	6. ELF-16	10/27/2022	17:15	W		4	x	x	x	x	x	x	x	x				x									
	~~7. ELF-17~~			W		~~4~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~				~~x~~									
	8.																										
-15	9. Duplicate - (CCR)	10/27/2022	-	W		4	x	x	x	x	x	x	x	x				x									
-16	10. Field Blank - (CCR)	10/27/2022	17:15	W		4	x	x	x	x	x	x	x	x				x									

Sampled by: Bradley Giles & Dennis Vanderbeek | Sampled by: [signature]

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
	10/28/22 13:00		10/28/22 1300
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.7									
QC Sample ID: BWK0017-BLK1	Batch: BWK0017								
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
QC Sample ID: BWK0031-BLK1	Batch: BWK0031								
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					0.009			0.005	1.00
HB - Recovery for this parameter exceeded the upper acceptance limit. Associated sample(s) were all non-detect and therefore accepted and reported for this parameter.									
QC Sample ID: BWK0040-BLK1	Batch: BWK0040								
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total					ND			0.005	1.00
Boron, Total					ND			0.05	1.00
Calcium, Total					ND			0.2	1.00
Chromium, Total					ND			0.005	1.00
Lithium, Total					ND			0.005	1.00
LCS - EPA 200.7									
QC Sample ID: BWK0017-BS1	Batch: BWK0017								
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	101		85 - 115		0.202		0.200	0.005	1.00
Boron, Total	99.2		85 - 115		0.50		0.500	0.05	1.00
Calcium, Total	96.9		85 - 115		9.9		10.2	0.2	1.00
Chromium, Total	102		85 - 115		0.204		0.200	0.005	1.00
Lithium, Total	108		85 - 115		0.217		0.200	0.005	1.00
QC Sample ID: BWK0031-BS1	Batch: BWK0031								
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Barium, Total	102		85 - 115		0.204		0.200	0.005	1.00
Boron, Total	102		85 - 115		0.51		0.500	0.05	1.00
Calcium, Total	101		85 - 115		10.3		10.2	0.2	1.00
Chromium, Total	105		85 - 115		0.210		0.200	0.005	1.00
Lithium, Total	112		85 - 115		0.225		0.200	0.005	1.00
QC Sample ID: BWK0040-BS1	Batch: BWK0040								
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	103		85 - 115		0.206		0.200	0.005	1.00
Boron, Total	100		85 - 115		0.50		0.500	0.05	1.00
Calcium, Total	98.7		85 - 115		10.1		10.2	0.2	1.00
Chromium, Total	106		85 - 115		0.212		0.200	0.005	1.00
Lithium, Total	109		85 - 115		0.218		0.200	0.005	1.00
Matrix Spike - EPA 200.7									
QC Sample ID: BWK0017-MS1	Batch: BWK0017		QC Source Sample: 22J2269-01						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	105		70 - 130		0.221	0.010	0.200	0.005	1.00
Boron, Total	117		70 - 130		3.52	2.94	0.500	0.05	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 200.7 (cont.)									
QC Sample ID: BWK0017-MS1	Batch: BWK0017		QC Source Sample: 22J2269-01						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Calcium, Total	162		70 - 130		401	385	10.2	0.2	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.									
Chromium, Total	99.4		70 - 130		0.201	0.002	0.200	0.005	1.00
Lithium, Total	84.5		70 - 130		1.81	1.64	0.200	0.005	1.00
QC Sample ID: BWK0017-MS2	Batch: BWK0017		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	103		70 - 130		0.268	0.063	0.200	0.005	1.00
Boron, Total	105		70 - 130		0.88	0.36	0.500	0.05	1.00
Calcium, Total	122		70 - 130		80.0	67.6	10.2	0.2	1.00
Chromium, Total	106		70 - 130		0.214	0.001	0.200	0.005	1.00
Lithium, Total	110		70 - 130		0.286	0.065	0.200	0.005	1.00
QC Sample ID: BWK0031-MS1	Batch: BWK0031		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Barium, Total	102		70 - 130		0.254	0.050	0.200	0.005	1.00
Boron, Total	103		70 - 130		0.97	0.46	0.500	0.05	1.00
Calcium, Total	93.2		70 - 130		125	116	10.2	0.2	1.00
Chromium, Total	101		70 - 130		0.206	0.004	0.200	0.005	1.00
Lithium, Total	92.4		70 - 130		0.389	0.204	0.200	0.005	1.00
QC Sample ID: BWK0031-MS2	Batch: BWK0031		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Barium, Total	102		70 - 130		0.264	0.061	0.200	0.005	1.00
Boron, Total	104		70 - 130		0.80	0.28	0.500	0.05	1.00
Calcium, Total	91.3		70 - 130		99.1	89.8	10.2	0.2	1.00
Chromium, Total	106		70 - 130		0.216	0.003	0.200	0.005	1.00
Lithium, Total	108		70 - 130		0.352	0.136	0.200	0.005	1.00
QC Sample ID: BWK0040-MS1	Batch: BWK0040		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	102		70 - 130		0.237	0.033	0.200	0.005	1.00
Boron, Total	103		70 - 130		0.60	0.09	0.500	0.05	1.00
Calcium, Total	81.0		70 - 130		190	182	10.2	0.2	1.00
Chromium, Total	102		70 - 130		0.211	0.006	0.200	0.005	1.00
Lithium, Total	102		70 - 130		0.235	0.031	0.200	0.005	1.00
QC Sample ID: BWK0040-MS2	Batch: BWK0040		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	97.7		70 - 130		0.239	0.043	0.200	0.005	1.00
Boron, Total	96.6		70 - 130		0.77	0.28	0.500	0.05	1.00
Calcium, Total	69.1		70 - 130		76.1	69.1	10.2	0.2	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.									
Chromium, Total	101		70 - 130		0.203	0.0009	0.200	0.005	1.00
Lithium, Total	104		70 - 130		0.263	0.055	0.200	0.005	1.00
Matrix Spike Dup - EPA 200.7									
QC Sample ID: BWK0017-MSD1	Batch: BWK0017		QC Source Sample: 22J2269-01						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	106	0.362	70 - 130	20	0.222	0.010	0.200	0.005	1.00

Matrix Spike Dup - EPA 200.7 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BWK0017-MSD1	Batch: BWK0017		QC Source Sample: 22J2269-01						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Boron, Total	131	1.93	70 - 130	20	3.59	2.94	0.500	0.05	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.									
Calcium, Total	245	2.10	70 - 130	20	410	385	10.2	0.2	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.									
Chromium, Total	101	1.92	70 - 130	20	0.205	0.002	0.200	0.005	1.00
Lithium, Total	142	6.15	70 - 130	20	1.92	1.64	0.200	0.005	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: BWK0017-MSD2	Batch: BWK0017		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	99.7	2.19	70 - 130	20	0.262	0.063	0.200	0.005	1.00
Boron, Total	98.9	3.23	70 - 130	20	0.85	0.36	0.500	0.05	1.00
Calcium, Total	87.1	4.51	70 - 130	20	76.5	67.6	10.2	0.2	1.00
Chromium, Total	102	3.81	70 - 130	20	0.206	0.001	0.200	0.005	1.00
Lithium, Total	105	3.92	70 - 130	20	0.275	0.065	0.200	0.005	1.00
QC Sample ID: BWK0031-MSD1	Batch: BWK0031		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Barium, Total	101	0.751	70 - 130	20	0.252	0.050	0.200	0.005	1.00
Boron, Total	101	0.701	70 - 130	20	0.97	0.46	0.500	0.05	1.00
Calcium, Total	90.5	0.217	70 - 130	20	125	116	10.2	0.2	1.00
Chromium, Total	105	3.76	70 - 130	20	0.214	0.004	0.200	0.005	1.00
Lithium, Total	108	7.58	70 - 130	20	0.419	0.204	0.200	0.005	1.00
QC Sample ID: BWK0031-MSD2	Batch: BWK0031		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Barium, Total	102	0.0378	70 - 130	20	0.265	0.061	0.200	0.005	1.00
Boron, Total	105	0.463	70 - 130	20	0.80	0.28	0.500	0.05	1.00
Calcium, Total	87.9	0.357	70 - 130	20	98.8	89.8	10.2	0.2	1.00
Chromium, Total	105	0.932	70 - 130	20	0.214	0.003	0.200	0.005	1.00
Lithium, Total	106	1.03	70 - 130	20	0.348	0.136	0.200	0.005	1.00
QC Sample ID: BWK0040-MSD1	Batch: BWK0040		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	102	0.211	70 - 130	20	0.237	0.033	0.200	0.005	1.00
Boron, Total	102	0.631	70 - 130	20	0.60	0.09	0.500	0.05	1.00
Calcium, Total	81.9	0.0442	70 - 130	20	190	182	10.2	0.2	1.00
Chromium, Total	103	0.661	70 - 130	20	0.212	0.006	0.200	0.005	1.00
Lithium, Total	110	6.58	70 - 130	20	0.251	0.031	0.200	0.005	1.00
QC Sample ID: BWK0040-MSD2	Batch: BWK0040		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Barium, Total	102	3.46	70 - 130	20	0.247	0.043	0.200	0.005	1.00
Boron, Total	101	3.09	70 - 130	20	0.79	0.28	0.500	0.05	1.00
Calcium, Total	86.0	2.23	70 - 130	20	77.9	69.1	10.2	0.2	1.00
Chromium, Total	106	4.56	70 - 130	20	0.213	0.0009	0.200	0.005	1.00
Lithium, Total	108	2.99	70 - 130	20	0.271	0.055	0.200	0.005	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 200.8									
QC Sample ID: BWJ1481-BLK1	Batch: BWJ1481								
Date Prepared: 10/31/2022	Date Analyzed: 11/02/2022								
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
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
QC Sample ID: BWK0023-BLK1	Batch: BWK0023								
Date Prepared: 11/01/2022	Date Analyzed: 11/03/2022								
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
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
QC Sample ID: BWK0028-BLK1	Batch: BWK0028								
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
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
Cobalt, Total					ND			0.0005	1.00
Lead, Total					ND			0.0005	1.00
Molybdenum, Total					ND			0.0005	1.00
Selenium, Total					ND			0.0005	1.00
Thallium, Total					ND			0.0002	1.00
LCS - EPA 200.8									
QC Sample ID: BWJ1481-BS1	Batch: BWJ1481								
Date Prepared: 10/31/2022	Date Analyzed: 11/02/2022								
Antimony, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Arsenic, Total	98.7		85 - 115		0.039		0.0400	0.0005	1.00
Beryllium, Total	99.8		85 - 115		0.040		0.0400	0.0005	1.00
Cadmium, Total	99.0		85 - 115		0.040		0.0400	0.0002	1.00
Cobalt, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Lead, Total	97.4		85 - 115		0.039		0.0400	0.0005	1.00
Molybdenum, Total	98.7		85 - 115		0.039		0.0400	0.0005	1.00
Selenium, Total	99.9		85 - 115		0.040		0.0400	0.0005	1.00
Thallium, Total	104		85 - 115		0.042		0.0400	0.0002	1.00
QC Sample ID: BWK0023-BS1	Batch: BWK0023								
Date Prepared: 11/01/2022	Date Analyzed: 11/03/2022								
Antimony, Total	104		85 - 115		0.042		0.0400	0.0005	1.00
Arsenic, Total	99.7		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	97.2		85 - 115		0.039		0.0400	0.0005	1.00
Cadmium, Total	99.8		85 - 115		0.040		0.0400	0.0002	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
LCS - EPA 200.8 (cont.)									
QC Sample ID: BWK0023-BS1	Batch: BWK0023								
Date Prepared: 11/01/2022	Date Analyzed: 11/03/2022								
Cobalt, Total	102		85 - 115		0.041		0.0400	0.0005	1.00
Lead, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Molybdenum, Total	99.9		85 - 115		0.040		0.0400	0.0005	1.00
Selenium, Total	100		85 - 115		0.040		0.0400	0.0005	1.00
Thallium, Total	109		85 - 115		0.043		0.0400	0.0002	1.00
QC Sample ID: BWK0028-BS1	Batch: BWK0028								
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Antimony, Total	103		85 - 115		0.041		0.0400	0.0005	1.00
Arsenic, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Beryllium, Total	98.4		85 - 115		0.039		0.0400	0.0005	1.00
Cadmium, Total	96.5		85 - 115		0.039		0.0400	0.0002	1.00
Cobalt, Total	97.9		85 - 115		0.039		0.0400	0.0005	1.00
Lead, Total	98.5		85 - 115		0.039		0.0400	0.0005	1.00
Molybdenum, Total	97.4		85 - 115		0.039		0.0400	0.0005	1.00
Selenium, Total	101		85 - 115		0.040		0.0400	0.0005	1.00
Thallium, Total	103		85 - 115		0.041		0.0400	0.0002	1.00
Matrix Spike - EPA 200.8									
QC Sample ID: BWJ1481-MS1	Batch: BWJ1481		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 11/02/2022								
Antimony, Total	106		70 - 130		0.043	0.0002	0.0400	0.0005	1.00
Arsenic, Total	102		70 - 130		0.041	0.0005	0.0400	0.0005	1.00
Beryllium, Total	101		70 - 130		0.040	ND	0.0400	0.0005	1.00
Cadmium, Total	98.2		70 - 130		0.039	0.00003	0.0400	0.0002	1.00
Cobalt, Total	95.8		70 - 130		0.039	0.0005	0.0400	0.0005	1.00
Lead, Total	95.0		70 - 130		0.038	0.00008	0.0400	0.0005	1.00
Molybdenum, Total	104		70 - 130		0.042	0.0004	0.0400	0.0005	1.00
Selenium, Total	100		70 - 130		0.041	0.0005	0.0400	0.0005	1.00
Thallium, Total	102		70 - 130		0.041	ND	0.0400	0.0002	1.00
QC Sample ID: BWJ1481-MS2	Batch: BWJ1481		QC Source Sample: 22J2269-01						
Date Prepared: 10/31/2022	Date Analyzed: 11/02/2022								
Antimony, Total	109		70 - 130		0.044	0.0001	0.0400	0.0005	1.00
Arsenic, Total	111		70 - 130		0.045	0.0007	0.0400	0.0005	1.00
Beryllium, Total	80.2		70 - 130		0.032	ND	0.0400	0.0005	1.00
Cadmium, Total	94.6		70 - 130		0.038	0.00004	0.0400	0.0002	1.00
Cobalt, Total	92.0		70 - 130		0.040	0.003	0.0400	0.0005	1.00
Lead, Total	88.3		70 - 130		0.035	0.00006	0.0400	0.0005	1.00
Molybdenum, Total	110		70 - 130		0.046	0.002	0.0400	0.0005	1.00
Selenium, Total	108		70 - 130		0.051	0.008	0.0400	0.0005	1.00
Thallium, Total	93.6		70 - 130		0.038	0.0001	0.0400	0.0002	1.00
QC Sample ID: BWK0023-MS1	Batch: BWK0023		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/03/2022								
Antimony, Total	104		70 - 130		0.042	0.0005	0.0400	0.0005	1.00
Arsenic, Total	104		70 - 130		0.052	0.011	0.0400	0.0005	1.00
Beryllium, Total	81.8		70 - 130		0.033	ND	0.0400	0.0005	1.00
Cadmium, Total	94.3		70 - 130		0.038	0.00003	0.0400	0.0002	1.00
Cobalt, Total	94.4		70 - 130		0.038	0.0005	0.0400	0.0005	1.00
Lead, Total	93.9		70 - 130		0.038	0.0005	0.0400	0.0005	1.00
Molybdenum, Total	107		70 - 130		0.053	0.010	0.0400	0.0005	1.00
Selenium, Total	103		70 - 130		0.045	0.003	0.0400	0.0005	1.00

Matrix Spike - EPA 200.8 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BWK0023-MS1	Batch: BWK0023		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/03/2022								
Thallium, Total	102		70 - 130		0.041	ND	0.0400	0.0002	1.00
QC Sample ID: BWK0023-MS2	Batch: BWK0023		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/03/2022								
Antimony, Total	107		70 - 130		0.043	0.00005	0.0400	0.0005	1.00
Arsenic, Total	103		70 - 130		0.042	0.0002	0.0400	0.0005	1.00
Beryllium, Total	95.2		70 - 130		0.038	ND	0.0400	0.0005	1.00
Cadmium, Total	99.8		70 - 130		0.040	0.00002	0.0400	0.0002	1.00
Cobalt, Total	97.7		70 - 130		0.039	0.00009	0.0400	0.0005	1.00
Lead, Total	97.4		70 - 130		0.042	0.003	0.0400	0.0005	1.00
Molybdenum, Total	105		70 - 130		0.043	0.0004	0.0400	0.0005	1.00
Selenium, Total	101		70 - 130		0.041	0.0006	0.0400	0.0005	1.00
Thallium, Total	103		70 - 130		0.041	ND	0.0400	0.0002	1.00
QC Sample ID: BWK0028-MS1	Batch: BWK0028		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Antimony, Total	102		70 - 130		0.041	0.00003	0.0400	0.0005	1.00
Arsenic, Total	101		70 - 130		0.041	0.0004	0.0400	0.0005	1.00
Beryllium, Total	103		70 - 130		0.041	ND	0.0400	0.0005	1.00
Cadmium, Total	95.8		70 - 130		0.038	ND	0.0400	0.0002	1.00
Cobalt, Total	93.6		70 - 130		0.038	0.00008	0.0400	0.0005	1.00
Lead, Total	96.4		70 - 130		0.039	0.00006	0.0400	0.0005	1.00
Molybdenum, Total	100		70 - 130		0.040	0.0002	0.0400	0.0005	1.00
Selenium, Total	102		70 - 130		0.041	0.0002	0.0400	0.0005	1.00
Thallium, Total	101		70 - 130		0.040	ND	0.0400	0.0002	1.00
QC Sample ID: BWK0028-MS2	Batch: BWK0028		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Antimony, Total	103		70 - 130		0.041	0.00004	0.0400	0.0005	1.00
Arsenic, Total	102		70 - 130		0.042	0.001	0.0400	0.0005	1.00
Beryllium, Total	102		70 - 130		0.041	ND	0.0400	0.0005	1.00
Cadmium, Total	95.6		70 - 130		0.038	ND	0.0400	0.0002	1.00
Cobalt, Total	93.5		70 - 130		0.037	0.00008	0.0400	0.0005	1.00
Lead, Total	97.5		70 - 130		0.040	0.0006	0.0400	0.0005	1.00
Molybdenum, Total	99.6		70 - 130		0.041	0.001	0.0400	0.0005	1.00
Selenium, Total	102		70 - 130		0.041	0.0005	0.0400	0.0005	1.00
Thallium, Total	103		70 - 130		0.041	0.0001	0.0400	0.0002	1.00

QC Report for Work Order (WO) - 22J2269

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 245.1									
QC Sample ID: BWK0110-BLK1	Batch: BWK0110								
Date Prepared: 11/02/2022	Date Analyzed: 11/03/2022								
Mercury, Total					ND			0.00015	1.00
QC Sample ID: BWK0364-BLK1	Batch: BWK0364								
Date Prepared: 11/08/2022	Date Analyzed: 11/08/2022								
Mercury, Total					ND			0.00015	1.00
LCS - EPA 245.1									
QC Sample ID: BWK0110-BS1	Batch: BWK0110								
Date Prepared: 11/02/2022	Date Analyzed: 11/03/2022								
Mercury, Total	96.6		85 - 115		0.00483		0.00500	0.00015	1.00
QC Sample ID: BWK0364-BS1	Batch: BWK0364								
Date Prepared: 11/08/2022	Date Analyzed: 11/08/2022								
Mercury, Total	105		85 - 115		0.00526		0.00500	0.00015	1.00
Matrix Spike - EPA 245.1									
QC Sample ID: BWK0110-MS1	Batch: BWK0110		QC Source Sample: 22J2269-01						
Date Prepared: 11/02/2022	Date Analyzed: 11/03/2022								
Mercury, Total	126		75 - 125		0.00629	ND	0.00500	0.00015	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.									
QC Sample ID: BWK0110-MS2	Batch: BWK0110		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/02/2022	Date Analyzed: 11/03/2022								
Mercury, Total	101		75 - 125		0.00506	ND	0.00500	0.00015	1.00
QC Sample ID: BWK0364-MS1	Batch: BWK0364		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/08/2022	Date Analyzed: 11/08/2022								
Mercury, Total	119		75 - 125		0.00594	ND	0.00500	0.00015	1.00
Matrix Spike Dup - EPA 245.1									
QC Sample ID: BWK0110-MSD1	Batch: BWK0110		QC Source Sample: 22J2269-01						
Date Prepared: 11/02/2022	Date Analyzed: 11/03/2022								
Mercury, Total	128	1.37	75 - 125	20	0.00638	ND	0.00500	0.00015	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.									
QC Sample ID: BWK0110-MSD2	Batch: BWK0110		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/02/2022	Date Analyzed: 11/03/2022								
Mercury, Total	105	4.18	75 - 125	20	0.00527	ND	0.00500	0.00015	1.00
QC Sample ID: BWK0364-MSD1	Batch: BWK0364		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/08/2022	Date Analyzed: 11/08/2022								
Mercury, Total	117	1.45	75 - 125	20	0.00585	ND	0.00500	0.00015	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - EPA 300.0									
QC Sample ID: BWJ1451-BLK1	Batch: BWJ1451								
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
Chloride					ND			1.00	1.00
Fluoride					ND			0.100	1.00
QC Sample ID: BWJ1472-BLK1	Batch: BWJ1472								
Date Prepared: 10/31/2022	Date Analyzed: 11/01/2022								
Chloride					ND			1.00	1.00
Fluoride					ND			0.100	1.00
QC Sample ID: BWK0025-BLK1	Batch: BWK0025								
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Chloride					ND			1.00	1.00
Sulfate					ND			1.00	1.00
QC Sample ID: BWK0160-BLK1	Batch: BWK0160								
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride					ND			1.00	1.00
Sulfate					ND			1.00	1.00
QC Sample ID: BWK0169-BLK1	Batch: BWK0169								
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride					ND			1.00	1.00
Fluoride					ND			0.100	1.00
Sulfate					ND			1.00	1.00
QC Sample ID: BWK0292-BLK1	Batch: BWK0292								
Date Prepared: 11/07/2022	Date Analyzed: 11/07/2022								
Sulfate					ND			1.00	1.00
QC Sample ID: BWK0736-BLK1	Batch: BWK0736								
Date Prepared: 11/15/2022	Date Analyzed: 11/16/2022								
Chloride					ND			1.00	1.00
Sulfate					ND			1.00	1.00
LCS - EPA 300.0									
QC Sample ID: BWJ1451-BS1	Batch: BWJ1451								
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
Chloride	96.6		90 - 110		48.3		50.0	1.00	1.00
Fluoride	95.5		90 - 110		4.78		5.00	0.100	1.00
QC Sample ID: BWJ1472-BS1	Batch: BWJ1472								
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
Chloride	102		90 - 110		51.0		50.0	1.00	1.00
Fluoride	100		90 - 110		5.02		5.00	0.100	1.00
QC Sample ID: BWK0025-BS1	Batch: BWK0025								
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Chloride	103		90 - 110		51.3		50.0	1.00	1.00
Sulfate	102		90 - 110		51.1		50.0	1.00	1.00
QC Sample ID: BWK0160-BS1	Batch: BWK0160								
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	99.6		90 - 110		49.8		50.0	1.00	1.00
Sulfate	99.1		90 - 110		49.6		50.0	1.00	1.00
QC Sample ID: BWK0169-BS1	Batch: BWK0169								
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
LCS - EPA 300.0 (cont.)									
QC Sample ID: BWK0169-BS1	Batch: BWK0169								
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	101		90 - 110		50.5		50.0	1.00	1.00
Fluoride	98.5		90 - 110		4.93		5.00	0.100	1.00
Sulfate	100		90 - 110		50.1		50.0	1.00	1.00
QC Sample ID: BWK0292-BS1	Batch: BWK0292								
Date Prepared: 11/07/2022	Date Analyzed: 11/07/2022								
Sulfate	102		90 - 110		51.2		50.0	1.00	1.00
QC Sample ID: BWK0736-BS1	Batch: BWK0736								
Date Prepared: 11/15/2022	Date Analyzed: 11/16/2022								
Chloride	99.9		90 - 110		49.9		50.0	1.00	1.00
Sulfate	100		90 - 110		50.2		50.0	1.00	1.00
Matrix Spike - EPA 300.0									
QC Sample ID: BWJ1451-MS1	Batch: BWJ1451		QC Source Sample: 22J2269-01						
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
Chloride	69.3		80 - 120		360	222	200	20.0	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.									
Fluoride	81.4		80 - 120		16.3	ND	20.0	2.00	1.00
QC Sample ID: BWJ1451-MS2	Batch: BWJ1451		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
Chloride	82.3		80 - 120		93.1	10.8	100	10.0	1.00
Fluoride	79.2		80 - 120		8.20	0.279	10.0	1.00	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.									
QC Sample ID: BWJ1472-MS1	Batch: BWJ1472		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 11/01/2022								
Chloride	111		80 - 120		630	407	200	22.0	1.00
Fluoride	92.7		80 - 120		19.7	1.14	20.0	2.20	1.00
QC Sample ID: BWJ1472-MS2	Batch: BWJ1472		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 11/01/2022								
Chloride	63.9		80 - 120		1260	1130	200	22.0	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.									
Fluoride	98.0		80 - 120		19.6	ND	20.0	2.20	1.00
QC Sample ID: BWK0025-MS1	Batch: BWK0025		QC Source Sample: 22J2269-01						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Chloride	97.6		80 - 120		1160	181	1000	110	1.00
Sulfate	-147		80 - 120		6600	8070	1000	110	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: BWK0025-MS2	Batch: BWK0025		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Chloride	103		80 - 120		103		100	11.0	1.00
Sulfate	97.7		80 - 120		103	5.41	100	11.0	1.00
QC Sample ID: BWK0160-MS1	Batch: BWK0160		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Matrix Spike - EPA 300.0 (cont.)									
QC Sample ID: BWK0160-MS1	Batch: BWK0160		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	96.4		80 - 120		33.3	22.6	11.1	1.11	1.00
Sulfate	105		80 - 120		141	129	11.1	1.11	1.00
QC Sample ID: BWK0160-MS2	Batch: BWK0160		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	97.5		80 - 120		109	11.2	100	11.0	1.00
Sulfate	92.4		80 - 120		95.7	3.26	100	11.0	1.00
QC Sample ID: BWK0169-MS1	Batch: BWK0169		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	91.1		80 - 120		55.4	45.3	11.1	1.11	1.00
Fluoride	130		80 - 120		1.44		1.11	0.111	1.00
Sulfate	88.8		80 - 120		77.7	67.9	11.1	1.11	1.00
QC Sample ID: BWK0169-MS2	Batch: BWK0169		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	62.7		80 - 120		162	155	11.1	1.11	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.									
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).									
Fluoride	118		80 - 120		1.31		1.11	0.111	1.00
Sulfate	94.3		80 - 120		76.7	66.2	11.1	1.11	1.00
QC Sample ID: BWK0292-MS1	Batch: BWK0292		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/07/2022	Date Analyzed: 11/07/2022								
Sulfate	106		80 - 120		46.6	34.8	11.1	1.11	1.00
QC Sample ID: BWK0292-MS2	Batch: BWK0292		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/07/2022	Date Analyzed: 11/07/2022								
Sulfate	101		80 - 120		145	43.9	100	11.0	1.00
QC Sample ID: BWK0736-MS1	Batch: BWK0736		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/15/2022	Date Analyzed: 11/16/2022								
Chloride	-2410		80 - 120		1690	1960	11.1	1.11	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.									
Sulfate	-37400		80 - 120		ND	4150	11.1	1.11	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.									
Matrix Spike Dup - EPA 300.0									
QC Sample ID: BWJ1451-MSD1	Batch: BWJ1451		QC Source Sample: 22J2269-01						
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
Chloride	82.9	7.25	80 - 120	20	388	222	200	20.0	1.00
Fluoride	83.2	2.20	80 - 120	20	16.6	ND	20.0	2.00	1.00
QC Sample ID: BWJ1451-MSD2	Batch: BWJ1451		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
Chloride	81.8	0.549	80 - 120	20	92.6	10.8	100	10.0	1.00
Fluoride	79.2	0.0244	80 - 120	20	8.20	0.279	10.0	1.00	1.00

Matrix Spike Dup - EPA 300.0 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BWJ1451-MSD2	Batch: BWJ1451		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 10/31/2022								
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.									
QC Sample ID: BWJ1472-MSD1	Batch: BWJ1472		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 11/01/2022								
Chloride	98.2	4.28	80 - 120	20	603	407	200	22.0	1.00
Fluoride	97.3	4.60	80 - 120	20	20.6	1.14	20.0	2.20	1.00
QC Sample ID: BWJ1472-MSD2	Batch: BWJ1472		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/31/2022	Date Analyzed: 11/01/2022								
Chloride	86.5	3.54	80 - 120	20	1300	1130	200	22.0	1.00
Fluoride	98.3	0.280	80 - 120	20	19.7	ND	20.0	2.20	1.00
QC Sample ID: BWK0025-MSD1	Batch: BWK0025		QC Source Sample: 22J2269-01						
Date Prepared: 11/01/2022	Date Analyzed: 11/02/2022								
Chloride	96.6	0.793	80 - 120	20	1150	181	1000	110	1.00
Sulfate	-131	2.41	80 - 120	20	6760	8070	1000	110	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: BWK0025-MSD2	Batch: BWK0025		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/01/2022	Date Analyzed: 11/01/2022								
Chloride	102	1.28	80 - 120	20	102		100	11.0	1.00
Sulfate	98.0	0.277	80 - 120	20	103	5.41	100	11.0	1.00
QC Sample ID: BWK0160-MSD1	Batch: BWK0160		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	99.1	0.899	80 - 120	20	33.6	22.6	11.1	1.11	1.00
Sulfate	105	0.0223	80 - 120	20	141	129	11.1	1.11	1.00
QC Sample ID: BWK0160-MSD2	Batch: BWK0160		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	98.2	0.675	80 - 120	20	109	11.2	100	11.0	1.00
Sulfate	93.7	1.31	80 - 120	20	97.0	3.26	100	11.0	1.00
QC Sample ID: BWK0169-MSD1	Batch: BWK0169		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	93.6	0.492	80 - 120	20	55.7	45.3	11.1	1.11	1.00
Fluoride	133	2.79	80 - 120	20	1.48		1.11	0.111	1.00
Sulfate	90.8	0.275	80 - 120	20	77.9	67.9	11.1	1.11	1.00
QC Sample ID: BWK0169-MSD2	Batch: BWK0169		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/03/2022	Date Analyzed: 11/03/2022								
Chloride	63.8	0.0791	80 - 120	20	163	155	11.1	1.11	1.00
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).									
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.									
Fluoride	120	1.26	80 - 120	20	1.33		1.11	0.111	1.00
Sulfate	95.8	0.213	80 - 120	20	76.9	66.2	11.1	1.11	1.00
QC Sample ID: BWK0292-MSD1	Batch: BWK0292		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/07/2022	Date Analyzed: 11/07/2022								
Sulfate	106	0.0894	80 - 120	20	46.6	34.8	11.1	1.11	1.00

Matrix Spike Dup - EPA 300.0 (cont.)

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
QC Sample ID: BWK0292-MSD2	Batch: BWK0292		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/07/2022	Date Analyzed: 11/07/2022								
Sulfate	97.8	2.41	80 - 120	20	142	43.9	100	11.0	1.00
QC Sample ID: BWK0736-MSD1	Batch: BWK0736		QC Source Sample: XXXXXXX-XX						
Date Prepared: 11/15/2022	Date Analyzed: 11/16/2022								
Chloride	-2440	0.249	80 - 120	20	1690	1960	11.1	1.11	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.									
Sulfate	-37400		80 - 120	20	ND	4150	11.1	1.11	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.									

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Blank - SM 2540 C									
QC Sample ID: BWJ1414-BLK1	Batch: BWJ1414								
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BWJ1425-BLK1	Batch: BWJ1425								
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)					ND			10	1.00
QC Sample ID: BWK0545-BLK1	Batch: BWK0545								
Date Prepared: 11/11/2022	Date Analyzed: 11/11/2022								
Total Dissolved Solids (TDS)					ND			10	1.00
Duplicate - SM 2540 C									
QC Sample ID: BWJ1414-DUP1	Batch: BWJ1414	QC Source Sample: 22J2269-01							
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)	3			10	12700	13100		100	1.00
QC Sample ID: BWJ1414-DUP2	Batch: BWJ1414	QC Source Sample: XXXXXXX-XX							
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)	0.2			10	8100	8120		100	1.00
QC Sample ID: BWJ1425-DUP1	Batch: BWJ1425	QC Source Sample: XXXXXXX-XX							
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)	2			10	2060	2100		20	1.00
QC Sample ID: BWJ1425-DUP2	Batch: BWJ1425	QC Source Sample: XXXXXXX-XX							
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)	8			10	1010	932		20	1.00
QC Sample ID: BWK0545-DUP1	Batch: BWK0545	QC Source Sample: XXXXXXX-XX							
Date Prepared: 11/11/2022	Date Analyzed: 11/11/2022								
Total Dissolved Solids (TDS)	0.2			10	1920	1920		20	1.00
QC Sample ID: BWK0545-DUP2	Batch: BWK0545	QC Source Sample: XXXXXXX-XX							
Date Prepared: 11/11/2022	Date Analyzed: 11/11/2022								
Total Dissolved Solids (TDS)	1			10	2300	2270		20	1.00
LCS - SM 2540 C									
QC Sample ID: BWJ1414-BS1	Batch: BWJ1414								
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)	106		90 - 110		424		400	20	1.00
QC Sample ID: BWJ1425-BS1	Batch: BWJ1425								
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
Total Dissolved Solids (TDS)	108		90 - 110		432		400	20	1.00
QC Sample ID: BWK0545-BS1	Batch: BWK0545								
Date Prepared: 11/11/2022	Date Analyzed: 11/11/2022								
Total Dissolved Solids (TDS)	100		90 - 110		400		400	20	1.00

Analyte	% Rec	RPD	Limits	RPD Max	Result	Source Conc	Spk Value	MRL	DF
Duplicate - SM 4500 H-B									
QC Sample ID: BWJ1416-DUP1	Batch: BWJ1416		QC Source Sample: 22J2269-01						
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
pH		0.416		3	7.2	7.2		0.1	1.00
SPH - Sample submitted past method specified holding time.									
QC Sample ID: BWJ1421-DUP1	Batch: BWJ1421		QC Source Sample: XXXXXXX-XX						
Date Prepared: 10/28/2022	Date Analyzed: 10/28/2022								
pH		0.285		3	7.0	7.0		0.1	1.00
SPH - Sample submitted past method specified holding time.									

CHEMTECH-FORD
LABORATORIES

12/13/2022

Work Order: 22J2268
Project: Hunter Power Plant CCR

Pacificorp - Environmental Remediation
Attn: Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

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.

NELAP ACCREDITED TNI LABORATORY

Approved By:

Melissa Connolly, Project Manager

Pacificorp - Environmental Remediation

Project: Hunter Power Plant CCR
Project Manager: Brad Giles

Laboratory ID	Sample Name
22J2268-01	ELF-2
22J2268-02	ELF-4
22J2268-03	ELF-5R
22J2268-04	ELF-6R
22J2268-05	ELF-7
22J2268-06	ELF-8
22J2268-07	ELF-9
22J2268-08	ELF-10
22J2268-09	ELF-11
22J2268-10	ELF-12
22J2268-11	ELF-13
22J2268-12	ELF-14
22J2268-13	ELF-15
22J2268-14	ELF-16
22J2268-15	Duplicate - (CCR)
22J2268-16	Field Blank - (CCR)

Work Order Report Narrative

The samples were subcontracted to Pace Analytical. The report is included after the Chain of Custody.

Chemtech-Ford Laboratories
Serving the Intermountain West Since 1953

9632 South 500 West
Sandy, UT 84070
O:(801) 262-7299 F: (866) 792-0093
www.ChemtechFord.com

Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **10/28/22 13:00 @ 2.1** °C
Date Reported: 12/13/2022
Project Name: **Hunter Power Plant CCR**

Sample ID: **ELF-2**

Matrix: **Water**
Lab ID: **22J2268-01**
Date Sampled: **10/27/22 14:50**
Sampled By: **Bradley Giles/Dennis Vanderbeek**

	Result	Units	Minimum Reporting Limit	Method	Preparation Date/Time	Analysis Date/Time	Flag(s)
Radiochemistry							
Radium-226	See Attached for All Results	pCi/L	0.46	EPA 903.0	12/3/22	12/3/22	SL-62

Chemtech-Ford Laboratories
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9632 South 500 West
Sandy, UT 84070
O:(801) 262-7299 F: (866) 792-0093
www.ChemtechFord.com

Certificate of Analysis

Pacificorp - Environmental Remediation
Brad Giles
1000 S Highway 10
Castle Dale, UT 84513

PO#:
Receipt: **10/28/22 13:00 @ 2.1** °C
Date Reported: 12/13/2022
Project Name: **Hunter Power Plant CCR**

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

SL-62 = Analysis performed by Pace Analytical National, Mount Juliet, TN 37122

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

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: VL

Walkin
01-16
AG (2)
1183

22J2268 1 of 2

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Li, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
~~01~~	~~1. ELF-1D~~			W		4	x	x	x	x	x	x	x	x				x								
02 01	2. ELF-2	10/27/2022	14:50	W		4	x	x	x	x	x	x	x	x				x								
03	~~3. ELF-3~~			W		4	x	x	x	x	x	x	x	x				x								
04 02	4. ELF-4	10/26/2022	17:30	W		4	x	x	x	x	x	x	x	x				x								
05 03	5. ELF-5R	10/27/2022	16:25	W		4	x	x	x	x	x	x	x	x				x								
06 04	6. ELF-6R	10/27/2022	15:50	W		4	x	x	x	x	x	x	x	x				x								
07 05	7. ELF-7	10/26/2022	18:15	W		4	x	x	x	x	x	x	x	x				x								
08 06	8. ELF-8	10/26/2022	14:50	W		4	x	x	x	x	x	x	x	x				x								
09 07	9. ELF-9	10/27/2022	12:30	W		4	x	x	x	x	x	x	x	x				x								
08	10. ELF-10	10/27/2022	11:50	W		4	x	x	x	x	x	x	x	x				x								

VL

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

ON ICE NOT ON ICE Temp (C°): 2.1

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
	10/28/22 13:00		10/28/22 1300
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

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 agress to pay collection costs and attorney's fees.

CHEMTECH - FORD ANALYTICAL LABORATORY

CHAIN OF CUSTODY

COMPANY: PacifiCorp Environmental Remediation
ADDRESS: 1407 West North Temple Ste 270
CITY/STATE/ZIP: Salt Lake City, Ut 84140
PHONE #: (435) 748-6576 FAX:
CONTACT: Bradley Giles PROJECT: Hunter Power Plant CCR
EMAIL: brad.giles@pacificorp.com

BILLING ADDRESS: email invoice to Bradley Giles
BILLING CITY/STATE/ZIP:
PURCHASE ORDER #:

CHEMTECH-FORD LABORATORIES

TURNAROUND REQUIRED:* QC Level 2+ (10 business days)
* Expedited turnaround subject to additional charge

22J2268 2of 2

Lab Use Only	CLIENT SAMPLE INFORMATION					TESTS REQUESTED																Bacteria			
	LOCATION / IDENTIFICATION	DATE	TIME	MATRIX	Field: Residual Chlorine	# of Containers	TDS A2540C	Fluoride E300.0	pH A4500-H B	Total Metals: Sb, As, Ba, Be, B	Total Metals: CD, Ca, Cr, Co, Pb	Total Metals: Ll, Mo, Se, Tl, Hg	Total Metals: E200.7 / E200.8 / E245.1	Cloride / Sulfate E300.0				Radium A7500-RA; Radium 226 & 228	(separate & combined)					Total Coliform + E. coli (Present/Absent)	Total Coliform + E. coli (Enumerated)	HPC (Plate Count)	E. Coli Only
-09	1. ELF-11	10/26/2022	13:50	W		4	x	x	x	x	x	x	x	x				x								
-10	2. ELF-12	10/27/2022	10:00	W		4	x	x	x	x	x	x	x	x				x								
-11	3. ELF-13	10/26/2022	16:55	W		4	x	x	x	x	x	x	x	x				x								
-12	4. ELF-14	10/26/2022	15:50	W		4	x	x	x	x	x	x	x	x				x								
-13	5. ELF-15	10/27/2022	18:00	W		4	x	x	x	x	x	x	x	x				x								
-14	6. ELF-16	10/27/2022	17:15	W		4	x	x	x	x	x	x	x	x				x								
	~~7. ELF-17~~			W		~~4~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~				~~x~~								
	8.																								
-15	9. Duplicate - (CCR)	10/27/2022	-	W		4	x	x	x	x	x	x	x	x				x								
-16	10. Field Blank - (CCR)	10/27/2022	17:15	W		4	x	x	x	x	x	x	x	x				x								

Sampled by: Bradley Giles & Dennis Vanderbeek
Sampled by: [signature]

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
	10/28/22 13:00		10/28/22 1300
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time
Relinquished by: [signature]	Date/Time	Received by: [signature]	Date/Time

CHEMTECH-FORD
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Sandy, UT 84070

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www.ChemtechFord.com

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

ANALYTICAL REPORT

December 12, 2022

Chemtech-Ford Laboratories

Sample Delivery Group:	L1552437
Samples Received:	11/01/2022
Project Number:	22J2268
Description:	
Site:	001
Report To:	Mark Broadhead 9632 S 500 S Sandy, UT 84070

Entire Report Reviewed By:

Donna Eidson
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

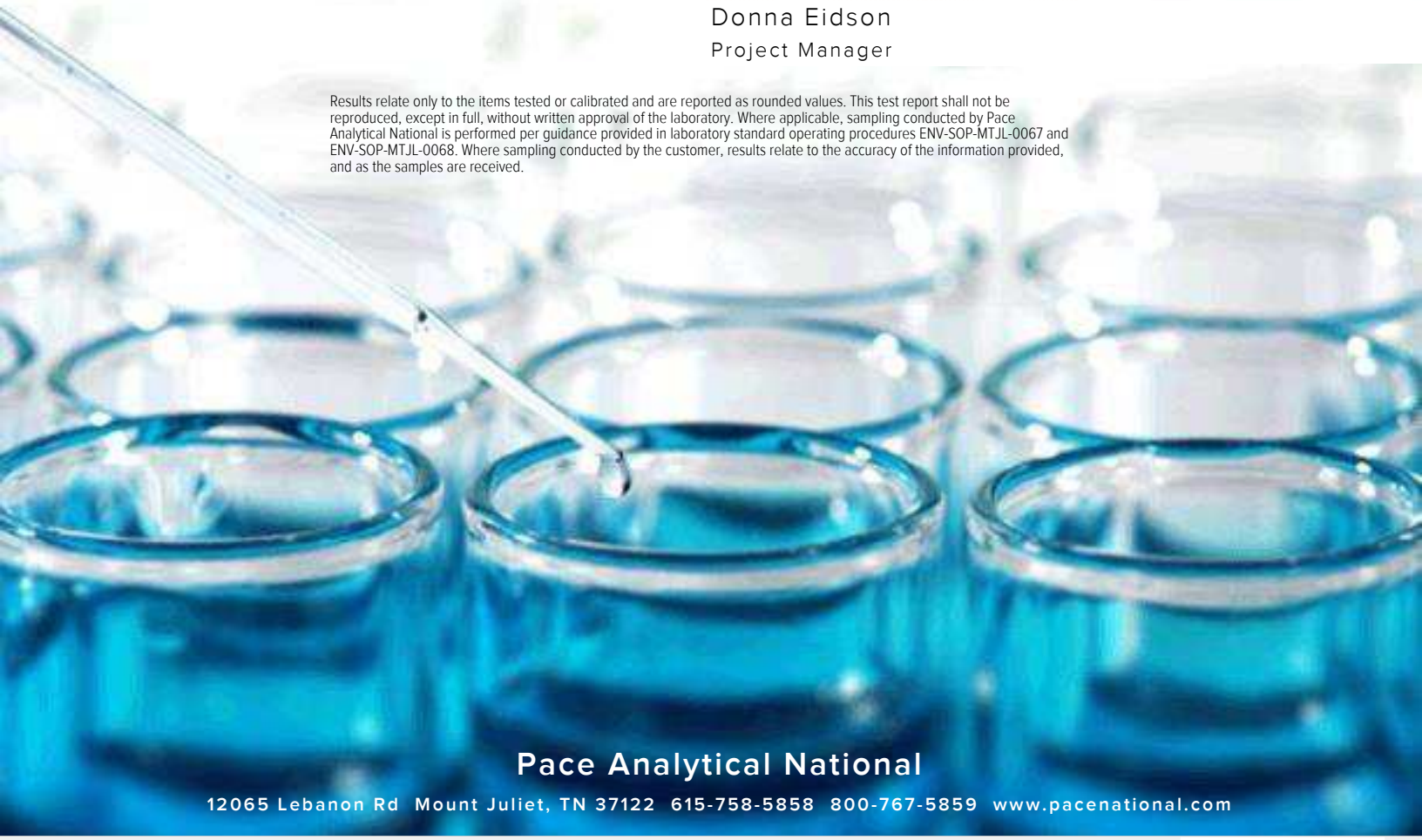


TABLE OF CONTENTS

Cp: Cover Page 1

Tc: Table of Contents 2

Ss: Sample Summary 3

Cn: Case Narrative 6

Sr: Sample Results 7

22J2268-01 L1552437-01 7

22J2268-02 L1552437-02 8

22J2268-03 L1552437-03 9

22J2268-04 L1552437-04 10

22J2268-05 L1552437-05 11

22J2268-06 L1552437-06 12

22J2268-07 L1552437-07 13

22J2268-08 L1552437-08 14

22J2268-09 L1552437-09 15

22J2268-10 L1552437-10 16

22J2268-11 L1552437-11 17

22J2268-12 L1552437-12 18

22J2268-13 L1552437-13 19

22J2268-14 L1552437-14 20

22J2268-15 L1552437-15 21

22J2268-16 L1552437-16 22

Qc: Quality Control Summary 23

Radiochemistry by Method 903.0/9315 23

Radiochemistry by Method 904/9320 24

Gl: Glossary of Terms 26

Al: Accreditations & Locations 27

Sc: Sample Chain of Custody 28

22J2268-01 L1552437-01 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 14:50	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 13:42	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-02 L1552437-02 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/26/22 17:30	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 14:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-03 L1552437-03 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 16:25	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 14:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-04 L1552437-04 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 15:50	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 14:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-05 L1552437-05 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/26/22 18:15	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 14:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-06 L1552437-06 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/26/22 14:50	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 15:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-07 L1552437-07 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 12:30	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 15:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-08 L1552437-08 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 11:50	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 15:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-09 L1552437-09 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/26/22 13:50	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 15:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-10 L1552437-10 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 10:00	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 16:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-11 L1552437-11 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/26/22 16:55	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 16:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-12 L1552437-12 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/26/22 15:50	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 16:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-13 L1552437-13 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 18:00	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 16:43	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-14 L1552437-14 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 17:15	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 17:44	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-15 L1552437-15 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 00:00	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 17:44	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1960606	1	11/21/22 15:40	12/07/22 11:03	SWM	Mt. Juliet, TN

22J2268-16 L1552437-16 Non-Potable Water

Collected by	Collected date/time	Received date/time
	10/27/22 17:15	11/01/22 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 903.0/9315	WG1961181	1	11/30/22 10:57	12/03/22 17:44	SNR	Mt. Juliet, TN
Radiochemistry by Method 904/9320	WG1961949	1	11/22/22 10:36	12/08/22 10:43	SWM	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Donna Eidson
Project Manager

Radiochemistry by Method 903.0/9315

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Radium-226	1.08		0.524	0.460	12/03/2022 13:42	WG1961181
(T) Barium	*101*			*30.0-143*	*12/03/2022 13:42*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.90		0.215	0.335	12/07/2022 11:03	WG1960606
(T) Barium	*101*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*109*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.352		0.295	0.269	12/03/2022 14:43	WG1961181
(T) Barium	*107*			*30.0-143*	*12/03/2022 14:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.95		0.204	0.310	12/07/2022 11:03	WG1960606
(T) Barium	*106*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*122*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	1.10		0.490	0.271	12/03/2022 14:43	WG1961181
(T) Barium	*109*			*30.0-143*	*12/03/2022 14:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.51		0.213	0.309	12/07/2022 11:03	WG1960606
(T) Barium	*109*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*105*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Radium-226	0.311		0.288	0.261	12/03/2022 14:43	WG1961181
(T) Barium	*114*			*30.0-143*	*12/03/2022 14:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.22		0.205	0.342	12/07/2022 11:03	WG1960606
(T) Barium	*99.5*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*109*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Radium-226	0.763		0.457	0.392	12/03/2022 14:43	WG1961181
(T) Barium	*120*			*30.0-143*	*12/03/2022 14:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.44		0.230	0.382	12/07/2022 11:03	WG1960606
(T) Barium	*92.5*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*121*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.546		0.351	0.256	12/03/2022 15:43	WG1961181
(T) Barium	*112*			*30.0-143*	*12/03/2022 15:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.99		0.253	0.402	12/07/2022 11:03	WG1960606
(T) Barium	*103*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*115*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.103	J	0.202	0.273	12/03/2022 15:43	WG1961181
(T) Barium	*107*			*30.0-143*	*12/03/2022 15:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.42		0.226	0.372	12/07/2022 11:03	WG1960606
(T) Barium	*105*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*124*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Radium-226	1.49		0.559	0.263	12/03/2022 15:43	WG1961181
(T) Barium	*112*			*30.0-143*	*12/03/2022 15:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.68		0.253	0.417	12/07/2022 11:03	WG1960606
(T) Barium	*131*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*120*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.402	J	0.369	0.412	12/03/2022 15:43	WG1961181
(T) Barium	*112*			*30.0-143*	*12/03/2022 15:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.24		0.248	0.388	12/07/2022 11:03	WG1960606
(T) Barium	*107*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*111*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Radium-226	2.31		0.673	0.261	12/03/2022 16:43	WG1961181
(T) Barium	*108*			*30.0-143*	*12/03/2022 16:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	3.67		0.294	0.423	12/07/2022 11:03	WG1960606
(T) Barium	*110*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*123*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Radium-226	0.867		0.435	0.273	12/03/2022 16:43	WG1961181
(T) Barium	*106*			*30.0-143*	*12/03/2022 16:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	2.06		0.312	0.514	12/07/2022 11:03	WG1960606
(T) Barium	*97.9*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*130*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.811		0.421	0.266	12/03/2022 16:43	WG1961181
(T) Barium	*109*			*30.0-143*	*12/03/2022 16:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.99		0.274	0.445	12/07/2022 11:03	WG1960606
(T) Barium	*96.5*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*115*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.696		0.436	0.429	12/03/2022 16:43	WG1961181
(T) Barium	*106*			*30.0-143*	*12/03/2022 16:43*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.77		0.265	0.434	12/07/2022 11:03	WG1960606
(T) Barium	*91.8*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*117*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	1.02		0.456	0.263	12/03/2022 17:44	WG1961181
(T) Barium	*106*			*30.0-143*	*12/03/2022 17:44*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.71		0.267	0.400	12/07/2022 11:03	WG1960606
(T) Barium	*93.5*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*132*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.454		0.328	0.274	12/03/2022 17:44	WG1961181
(T) Barium	*105*			*30.0-143*	*12/03/2022 17:44*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.38		0.237	0.392	12/07/2022 11:03	WG1960606
(T) Barium	*96.0*			*30.0-143*	*12/07/2022 11:03*	WG1960606
(T) Yttrium	*123*			*30.0-136*	*12/07/2022 11:03*	WG1960606

Radiochemistry by Method 903.0/9315

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Radium-226	0.100	J	0.196	0.273	12/03/2022 17:44	WG1961181
(T) Barium	*104*			*30.0-143*	*12/03/2022 17:44*	WG1961181

Radiochemistry by Method 904/9320

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.124	U	0.249	0.471	12/08/2022 10:43	WG1961949
(T) Barium	*95.0*			*30.0-143*	*12/08/2022 10:43*	WG1961949
(T) Yttrium	*106*			*30.0-136*	*12/08/2022 10:43*	WG1961949

Method Blank (MB)

(MB) R3868040-1 12/03/22 12:42

Analyte	MB Result	MB Qualifier	MB Uncertainty	MB MDA
	pCi/l		+ / -	pCi/l
Radium-226	0.182		0.152	0.171
(T) Barium	*99.2*		*99.2*	

L1552437-16 Original Sample (OS) • Duplicate (DUP)

(OS) L1552437-16 12/03/22 17:44 • (DUP) R3868040-5 12/03/22 13:42

Analyte	Original Result	Original Uncertainty	Original MDA	DUP Result	DUP Uncertainty	DUP MDA	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	+ / -	pCi/l	pCi/l	+ / -	pCi/l		%			%	
Radium-226	0.100	0.196	0.273	0.203	0.398	0.273	1	67.8	0.232	J	20	3
(T) Barium	*104*			*102*	*102*							

Laboratory Control Sample (LCS)

(LCS) R3868040-2 12/03/22 12:42

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-226	5.01	4.04	80.7	80.0-120	
(T) Barium			*99.8*		

L1552437-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1552437-01 12/03/22 13:42 • (MS) R3868040-3 12/03/22 12:42 • (MSD) R3868040-4 12/03/22 12:42

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.0	1.08	21.3	19.5	101	92.0	1	75.0-125			8.83		20
(T) Barium		*101*			*98.8*	*101*							

Method Blank (MB)

(MB) R3869832-1 12/07/22 11:03

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	0.212	J	0.170	0.310
(T) Barium	*88.7*		*88.7*	
(T) Yttrium	*101*		*101*	

L1552433-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1552433-11 12/07/22 11:03 • (DUP) R3869832-5 12/07/22 11:03

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.512	0.225	0.404	0.0459	0.295	0.404	1	167	1.26	U	20	3
(T) Barium	*104*			*95.3*	*95.3*							
(T) Yttrium	*115*			*110*	*110*							

Laboratory Control Sample (LCS)

(LCS) R3869832-2 12/07/22 11:03

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	5.01	100	80.0-120	
(T) Barium			*95.3*		
(T) Yttrium			*111*		

L1552437-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1552437-01 12/07/22 11:03 • (MS) R3869832-3 12/07/22 11:03 • (MSD) R3869832-4 12/07/22 11:03

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	1.90	10.9	9.85	89.8	79.5	1	70.0-130			9.95		20
(T) Barium		*101*			*104*	*98.3*							
(T) Yttrium		*109*			*124*	*123*							

Method Blank (MB)

(MB) R3870220-1 12/08/22 10:43

Analyte	MB Result pCi/l	MB Qualifier	MB Uncertainty + / - pCi/l	MB MDA pCi/l
Radium-228	-0.105	U	0.152	0.290
(T) Barium	*98.1*		*98.1*	
(T) Yttrium	*105*		*105*	

L1552442-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1552442-01 12/08/22 10:43 • (DUP) R3870220-5 12/08/22 10:43

Analyte	Original Result pCi/l	Original Uncertainty + / -	Original MDA pCi/l	DUP Result pCi/l	DUP Uncertainty + / -	DUP MDA pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-228	0.845	0.219	0.385	0.551	0.285	0.385	1	42.1	0.818		20	3
(T) Barium	*98.7*			*107*	*107*							
(T) Yttrium	*111*			*107*	*107*							

Laboratory Control Sample (LCS)

(LCS) R3870220-2 12/08/22 10:43

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-228	5.00	4.49	89.8	80.0-120	
(T) Barium			*99.9*		
(T) Yttrium			*103*		

L1552437-16 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1552437-16 12/08/22 10:43 • (MS) R3870220-3 12/08/22 10:43 • (MSD) R3870220-4 12/08/22 10:43

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-228	10.0	-0.124	9.64	9.63	96.4	96.3	1	70.0-130			0.0415		20
(T) Barium		*95.0*			*92.4*	*105*							
(T) Yttrium		*106*			*112*	*104*							

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDA	Minimum Detectable Activity.
Rec.	Recovery.
RER	Replicate Error Ratio.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(T)	Tracer - A radioisotope of known concentration added to a solution of chemically equivalent radioisotopes at a known concentration to assist in monitoring the yield of the chemical separation.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

CHEMTECH-FORD LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22J2268

SENDING LABORATORY:

Chemtech-Ford Laboratories
9632 South 500 West
Sandy, UT 84070
Phone: 801.262.7299
Fax: 866.792.0093

RECEIVING LABORATORY:

Pace Analytical Services
1700 Elm Street, Suite 200
Minneapolis, MN 55414
Phone: (612) 607-6356
Fax: -

Work Order Comments: QC Level 3 - Run QC on sample #1

L1552437

Laboratory ID: 22J2268-01 — **Matrix:** Water -01 — **Sampled:** 10/27/2022 14:50

Requested Test	Suggested Analytical Method *
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1
Radium-228	EPA 904.0
Radium-228 LLD	EPA 904.0
Radium-228 Variance	EPA 904.0
Radium-226	EPA 903.1

Laboratory ID: 22J2268-02 — **Matrix:** Water -02 — **Sampled:** 10/26/2022 17:30

Requested Test	Suggested Analytical Method *
Radium-226	EPA 903.1
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1
Radium-228	EPA 904.0
Radium-228 LLD	EPA 904.0
Radium-228 Variance	EPA 904.0

Laboratory ID: 22J2268-03 — **Matrix:** Water -03 — **Sampled:** 10/27/2022 16:25

Requested Test	Suggested Analytical Method *
Radium-226	EPA 903.1
Radium-228 Variance	EPA 904.0
Radium-228 LLD	EPA 904.0
Radium-228	EPA 904.0
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1

Released By — Date 10/28/22

Received By — Date 10/31/22 0945

Released By — Date 10/31/22 1400

Received By — Date 11/01/22 0800

*NOTE - If you are not certified for our suggested analytical method, please use your certified method.

CHEMTECH-FORD LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22J2268

L552437

Laboratory ID: 22J2268-04		Matrix: Water -04
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/27/2022 15:50
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22J2268-05		Matrix: Water -05
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/26/2022 18:15
Radium-228	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-226 LLD	EPA 903.1	

Laboratory ID: 22J2268-06		Matrix: Water -06
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/26/2022 14:50
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22J2268-07		Matrix: Water -07
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/27/2022 12:30
Radium-226	EPA 903.1	
Radium-228 Variance	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228	EPA 904.0	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	

Released By	Date	Received By	Date
[illegible]	10/28/22	[illegible]	10/31/22 0945
Released By	Date	Received By	Date
[illegible]	10/31/22 1700	[illegible]	11/01/22 0820

* NOTE - If you are not certified for our suggested analytical method, please use your certified method.

CHEMTECH-FORD
LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22J2268

L1552437

Laboratory ID: 22J2268-08 — **Matrix:** Water -08 — **Sampled:** 10/27/2022 11:50

Requested Test	Suggested Analytical Method *
Radium-228 LLD	EPA 904.0
Radium-226	EPA 903.1
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1
Radium-228	EPA 904.0
Radium-228 Variance	EPA 904.0

Laboratory ID: 22J2268-09 — **Matrix:** Water -09 — **Sampled:** 10/26/2022 13:50

Requested Test	Suggested Analytical Method *
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1
Radium-228	EPA 904.0
Radium-228 LLD	EPA 904.0
Radium-228 Variance	EPA 904.0
Radium-226	EPA 903.1

Laboratory ID: 22J2268-10 — **Matrix:** Water -10 — **Sampled:** 10/27/2022 10:00

Requested Test	Suggested Analytical Method *
Radium-226	EPA 903.1
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1
Radium-228	EPA 904.0
Radium-228 LLD	EPA 904.0
Radium-228 Variance	EPA 904.0

Laboratory ID: 22J2268-11 — **Matrix:** Water -11 — **Sampled:** 10/26/2022 16:55

Requested Test	Suggested Analytical Method *
Radium-226	EPA 903.1
Radium-228 Variance	EPA 904.0
Radium-228 LLD	EPA 904.0
Radium-228	EPA 904.0
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1

Released By	Date	Received By	Date
[signature]	10/28/22	[signature] PINSKUT	10/31/22 0945
[signature]	10/31/22 1700	[signature]	11/01/22 0500

* NOTE - If you are not certified for our suggested analytical method, please use your certified method.

CHEMTECH-FORD LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22J2268

L1552437

Laboratory ID: 22J2268-12		Matrix: Water -12
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/26/2022 15:50
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22J2268-13		Matrix: Water -13
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/27/2022 18:00
Radium-228	EPA 904.0	
Radium-228 Variance	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-226	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-226 LLD	EPA 903.1	

Laboratory ID: 22J2268-14		Matrix: Water -14
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/27/2022 17:15
Radium-226	EPA 903.1	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	
Radium-228	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228 Variance	EPA 904.0	

Laboratory ID: 22J2268-15		Matrix: Water -15
Requested Test	**Suggested Analytical Method ***	**Sampled:** 10/27/2022 00:00
Radium-226	EPA 903.1	
Radium-228 Variance	EPA 904.0	
Radium-228 LLD	EPA 904.0	
Radium-228	EPA 904.0	
Radium-226 LLD	EPA 903.1	
Radium-226 Variance	EPA 903.1	

Released By — Date 10/28/22 — Received By — Date 10/31/22 0945

Released By — Date 10/31/22 1200 — Received By — Date 11/01/22 0800

* NOTE - If you are not certified for our suggested analytical method, please use your certified method.

CHEMTECH-FORD LABORATORIES

SUBCONTRACT ORDER

Chemtech-Ford Laboratories

Work Order Number
22J2268

L1552457

Laboratory ID: 22J2268-16 -16

Matrix: Water

Sampled: 10/27/2022 17:15

Requested Test	Suggested Analytical Method *
Radium-228 Variance	EPA 904.0
Radium-226	EPA 903.1
Radium-226 LLD	EPA 903.1
Radium-226 Variance	EPA 903.1
Radium-228	EPA 904.0
Radium-228 LLD	EPA 904.0

Sample Receipt Checklist

COC Seal Present/Intact:	Y N	If Applicable	
COC Signed/Accurate:	Y N	VOA Zero Headspace:	Y N
Bottles arrive intact:	Y N	Pres.Correct/Check:	Y N
Correct bottles used:	Y N		
Sufficient volume sent:	Y N		
RAD Screen <0.5 mR/hr:	Y N		

Released By — Date 10/28/22

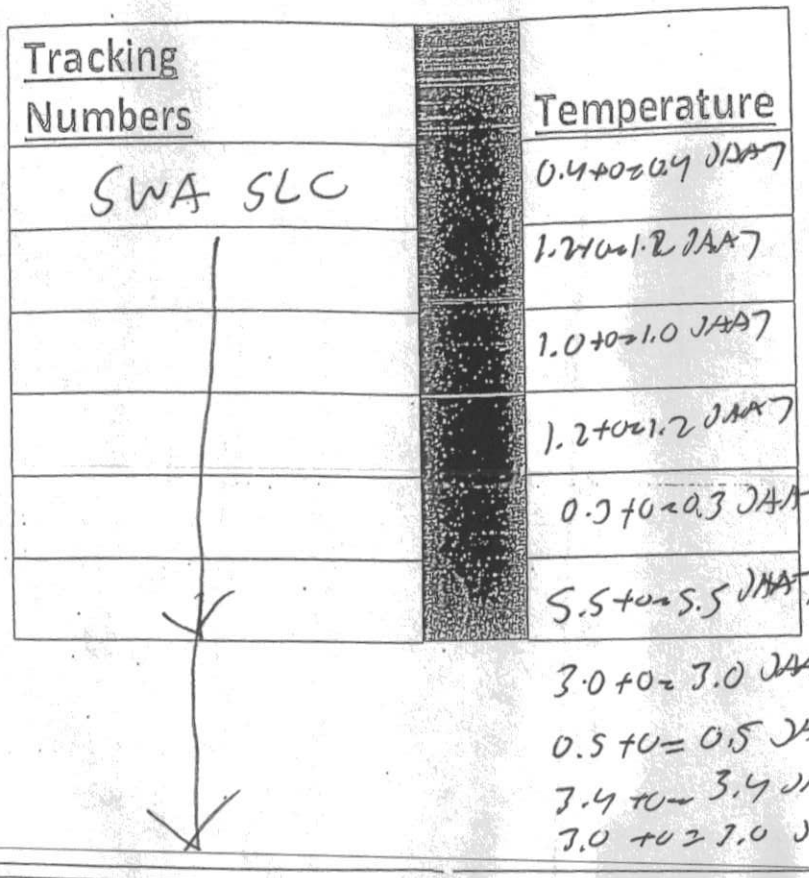
Received By — Date 10/31/22 0945

Released By — Date 10/31/22 1700

Received By — Date 11/01/22 0800

* NOTE - If you are not certified for our suggested analytical method, please use your certified method.

LI552437


Tracking Numbers
SWA SLC
Temperature
0.4+0=0.4 JAA7
1.2+0=1.2 JAA7
1.0+0=1.0 JAA7
1.2+0=1.2 JAA7
0.3+0=0.3 JAA7
5.5+0=5.5 JAA7
3.0+0=3.0 JAA7
0.5+0=0.5 JAA7
3.4+0=3.4 JAA7
3.0+0=3.0 JAA7

ATTACHMENT C:

Remedy Selection Progress Report – October 2022

Date: **October 15, 2022**
To: **Scott Wetzel**
From: **Dave Erickson**
Subject: **Semi-Annual Progress Report for Selecting and Designing Remedy**
Hunter Power Plant – CCR Landfill

In compliance with the requirements of the Coal Combustion Residuals (CCR) *Final Rule*, § 257.97(a), included herein is a semi-annual progress report for remedy selection and design. The Corrective Measures Assessment for the Hunter CCR Landfill was completed and posted to the plant operating record on 4/15/2019. The preferred alternative in the assessment was re-design and/or optimization of the existing horizontal well capture system, to address localized groundwater impacts. To date, the following activities have been completed in the selecting and designing a remedy:

- **6/28/2019:** Contract was initiated to complete an inspection of existing horizontal well system and to scope the work needed to evaluate the remedy.
- **7/23/2019:** Conducted a public meeting to discuss the results of the corrective measures assessment.
- **8/20/2019:** A site visit was completed by the project engineer to inspect and document the current condition of the existing horizontal well system. Research began on inspection, cleaning, and upgrade methods for the existing system.
- **8/26/2019:** Received comments from Heal Utah, Utah Clean Energy, and the Sierra Club. Comments were reviewed and addressed in Remedy Selection Report.
- **9/23/2019:** Contract finalized to inspect each horizontal well using a mobile camera. Equipment will be on site during the inspection to clean the wells if warranted.
- **11/12/2019:** Inspection caps were removed from the horizontal capture wells in an attempt to inspect well integrity. Well construction prevented the camera from entering the wells to perform the inspections, due to the size of the openings.
- **June 2020:** The initial vendor tasked with performing inspections was unable to successfully retrofit their camera equipment to fit the well openings. Additional vendor sources to perform the well inspections were sought for procurement.
- **October 2020:** Remedy selection report, nature and extent report, and corrective measures sampling and analysis plan were placed in the plant operating record. The remedy selection report was also placed on the CCR website.
- **January 2021:** Performed full inspection of existing horizontal wells. The wells are not in good working order.
- **March 2021:** An investigation to assess liquids in the landfill waste was attempted using Geoprobe direct push drilling methods. The drilling method could not reach the desired depths.
- **March 2022.** Sonic drilling was completed in the landfill to support an assessment of potential liquid in the landfill waste. Three new monitoring wells were installed downgradient of ELF-14, they include: ELF-15, ELF-16, and ELF-17.

- **May-October 2022.** Sampling and evaluation of data acquired from the new monitoring wells installed in the landfill is ongoing, to determine if additional corrective measures are needed.

Upcoming tasks relative to the CCR Landfill will include the following:

- Determine if additional downgradient monitoring wells are needed;
- Assess the need for design, permitting, and installation of additional horizontal wells or other corrective measures; and
- Continue semi-annual groundwater monitoring.