



DOMINION ENERGY SOUTH CAROLINA

COPE STATION CLASS III INDUSTRIAL LANDFILL

ORANGEBURG COUNTY, SOUTH CAROLINA

EPA CCR RULE COMPLIANCE

2023 CCR ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

January 31, 2024



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*TRC Environmental Corporation | Dominion Energy South Carolina
Cope Station Class III Industrial Landfill
2023 Annual Groundwater Monitoring and Corrective Action Report*

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Table of Contents

Executive Summary.....	iii
1. Introduction.....	1-1
1.1 Site Location.....	1-1
1.2 Site History.....	1-1
1.3 Key Actions.....	1-1
1.4 Monitoring Program Concerns.....	1-3
2. Site Information.....	2-1
2.1 Monitoring Well Network.....	2-1
2.2 Monitoring Well Installation and Decommissioning Activities.....	2-2
2.3 Groundwater Potentiometric Surface Evaluation.....	2-2
2.3.1 First Semiannual 2023 Detection Monitoring Program.....	2-3
2.3.2 Second Semiannual 2023 Detection Monitoring Program.....	2-4
3. Field Activities.....	3-1
3.1 Compliance Monitoring Program Sampling Activities.....	3-1
4. Laboratory Analytical Results.....	4-1
4.1 First Semiannual 2023 Detection Monitoring Program Event.....	4-1
4.2 Second Semiannual 2023 Detection Monitoring Program Event.....	4-1
5. Data Quality Validation.....	5-1
5.1 First Semiannual 2023 Compliance Event Findings.....	5-1
5.2 Second Semiannual 2023 Compliance Event Findings.....	5-1
6. Statistical Evaluation of Groundwater Data.....	6-1
6.1 Site-Specific Background Evaluations.....	6-1
6.1.1 First Semiannual 2023 Compliance Event.....	6-1
6.1.2 Second Semiannual 2023 Compliance Event.....	6-1
7. Conclusions.....	7-1
7.1 Findings.....	7-1
7.2 Planned Activities.....	7-1

8.	References	8-1
9.	Signature Page.....	9-1

List of Tables

Table 1	Summary of Historical CCR Static Water Level Data
Table 2	Summary of First Semiannual 2023 Detection Monitoring Program Sampling Event Data
Table 3	Summary of Second Semiannual 2023 Detection Monitoring Program Sampling Event Data

List of Figures

Figure 1	Site Location Map
Figure 2	CCR Rule Compliance Monitoring Well Network – March 2023
Figure 3	CCR Rule Compliance Monitoring Well Network – October 2023
Figure 4	Groundwater Potentiometric Surface Map – March 7, 2023
Figure 5	Groundwater Potentiometric Surface Map – October 2, 2023

List of Appendices

Appendix A	August 2022 Alternate Source Demonstration
Appendix B	March 2023 Alternate Source Demonstration
Appendix C	First Semiannual Detection Monitoring Program Event Field Data Sheets, Laboratory Reports, and Data Validation Forms
Appendix D	Second Semiannual Detection Monitoring Program Event Field Data Sheets, Laboratory Reports, and Data Validation Forms
Appendix E	First Semiannual Detection Monitoring Program Statistical Evaluation
Appendix F	Second Semiannual Detection Monitoring Program Statistical Evaluation

Executive Summary

Dominion Energy South Carolina (DESC) operates a Class III Industrial Landfill (Unit) for the disposal of coal combustion residuals (CCR) at the Cope Generating Station (Station) located near Cope, in Orangeburg County, South Carolina. The Unit receives CCR generated from the combustion of coal at the Station. Management of the CCR at the Unit is performed pursuant to national criteria established in Title 40 of the Code of Federal Regulations (40 CFR), Part 257 (CCR Rule), effective April 19, 2015, and subsequent revisions to the CCR Rule. Pursuant to the CCR Rule, the Station operator is required to complete an *Annual Groundwater Monitoring and Corrective Action Report* for the Unit by January 31st, annually.

This report documents the status of the CCR groundwater monitoring program for the Unit, summarizes key actions completed, describes issues encountered, actions taken to resolve identified concerns, and planned key activities for the upcoming year.

In accordance with 40 CFR Part 257.90(e)(6), the following information is being provided as an overview of the current status of groundwater monitoring and corrective action for the Unit:

- i. At the start of the current annual reporting period, indicate whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95.*
 - At the start of 2023, the Unit was operating under the detection monitoring program in accordance with §257.94.

- ii. At the end of the current annual reporting period, indicate whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95.*
 - At the end of 2023, the Unit was operating under the detection monitoring program in accordance with §257.94.

- iii. If it was determined that there was a statistically significant increase over background for one or more constituents listed in Appendix III to this part pursuant to §257.94(e).*
 - a. Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase.*
 - In 2023, there were SSIs over background for the following Appendix III constituents at the following wells:
 - Calcium – MW-LF-07
 - Chloride – MW-LF-02
 - Fluoride – MW-LF-07

- pH - MW-LF-07 and MW-LF-08
 - Total Dissolved Solids (TDS) - MW-LF-07
- b. *Provide the date when the assessment program was initiated for the CCR unit.*
- The Unit is in the detection monitoring program and has not initiated assessment monitoring to date.
- iv. *If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in Appendix IV to this part pursuant to §257.95(g).*
- a. *Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase.*
- The Unit is in the detection monitoring program and Appendix IV constituents were not evaluated in 2023.
- b. *Provide the date when the assessment of corrective measures was initiated for the CCR unit.*
- The Unit has not entered the assessment monitoring program and therefore not applicable.
- c. *Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit.*
- The Unit has not entered the assessment monitoring program and therefore not applicable.
- d. *Provide the date when the assessment of corrective measures was completed for the CCR unit.*
- The Unit has not entered the assessment monitoring program and therefore not applicable.
- v. *Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of the remedy selection.*
- The Unit has not entered the assessment monitoring program and therefore not applicable.
- vi. *Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.*
- Remedial activities were not initiated or are not ongoing during this current annual reporting period.

Section 1

Introduction

This *2023 CCR Annual Groundwater Monitoring and Corrective Action Report* (Report) was prepared by TRC Environmental Corporation (TRC) on behalf of Dominion Energy South Carolina (DESC) for the Class III Industrial Landfill (Unit) at the Cope Generating Station (Station) located near Cope, in Orangeburg County, South Carolina. Coal combustion residuals (CCR) are produced as part of the electrical generation operations and are disposed of in the Unit. The CCR Unit is managed in accordance with the South Carolina Department of Health and Environmental Control (SC DHEC) Class III Landfill Permit (Permit No. LF3-00028) and the national criteria established by the CCR Rule. DESC installed a groundwater monitoring system at the Unit that is subject to the groundwater monitoring and corrective action requirements provided under 40 CFR §257.90 through §257.98. In accordance with 40 CFR §257.90(e), DESC must prepare an annual report by January 31st that provides information regarding the groundwater monitoring and corrective action program at the Unit. This Report provides the monitoring and corrective action data and data evaluations for the semiannual CCR monitoring compliance events performed in March and October 2023.

1.1 Site Location

The Station is operated by DESC and is located at 405 Teamwork Road in Orangeburg County, South Carolina (**Figure 1**). The Station is located approximately 2 miles southwest of Cope, South Carolina. The Unit is located on the northwest portion of the Station property approximately 3,000 feet from the generating plant.

1.2 Site History

The Station is an active coal-fired power station located in Orangeburg County, SC. The facility began operations in 1996 and operates a single 417-megawatt coal-fired unit. The Station includes an active Class III landfill that is regulated under the CCR Rule. Phase 1 of the Unit was placed into operation in accordance with an operation approval issued by SC DHEC on November 12, 2014.

1.3 Key Actions

Key actions for the Unit to date are as follows:

- Permitted for management of CCR by SC DHEC under Class III Landfill Permit No. LF3-00028 originally issued March 22, 2013.

- Initiated the Detection Monitoring Program (DMP) on May 12, 2016, with the collection of eight (8) baseline/background samples and completed the background monitoring activities on July 27, 2017, pursuant to the CCR Rule §257.94(b).
- Conducted the initial DMP compliance sampling event on September 25-26, 2017, pursuant to 40 CFR §257.94.
- Placed a copy of the Units Groundwater Monitoring Plan (GMP) documenting the design information for the monitoring wells pursuant to 40 CFR §257.91(e)(1) in the Station's operating record on October 17, 2017, pursuant to 40 CFR §257.105(h)(2).
- Certified the groundwater monitoring system pursuant to 40 CFR §257.91(f) and posted the Certification in the Station's operating record on October 17, 2017, pursuant to 40 CFR §257.105(h)(3).
- Certified the selection of a statistical method pursuant to 40 CFR §257.93(f)(6) and posted the Certification in the Station's operating record on October 17, 2017, pursuant to 40 CFR §257.105(h)(4).
- Background concentrations of Appendix III constituents were updated using United States Environmental Protection Agency-approved statistical procedures in August 2021.
- In 2023, DESC completed an Alternate Source Demonstration (ASD) per 40 CFR §257.94(e)(2) in response to potential Statistically Significant Increases (SSIs) identified during the statistical evaluation of the data generated from the second semiannual 2022 (August 2022) detection monitoring event. The ASD was certified by a South Carolina-registered professional engineer. As required by 40 CFR §257.94(e)(2), a copy of the ASD is included in **Appendix A**. Based on the successful evaluation and the results presented in the ASD, DESC continued with detection monitoring in accordance with 40 CFR §257.94.
- In January 2023, DESC installed four new groundwater monitoring wells (MW-LF-07, MW-LF-08, MW-LF-09, and MW-LF-10) along the northern and western edges of the Unit as part of an evaluation of the United States Environmental Protection Agency (EPA) CCR Compliance Monitoring Well Network performed by TRC in July 2022. The newly installed groundwater monitoring wells were sampled monthly from January 2023 through August 2023, to collect eight rounds of background monitoring data. The groundwater monitoring system was revised and certified pursuant to 40 CFR §257.91(f). The certification was posted in the Station's operating record on September 29, 2023, pursuant to 40 CFR §257.105(h)(3).
- Conducted the first semiannual 2023 detection monitoring between March 7-9, 2023, and completed the sample analyses on March 22, 2023, pursuant to the CCR Rule [§257.94(b)].
- Completed a successful ASD per 40 CFR §257.94(e)(2) for the potential SSIs identified during the first semiannual 2023 detection monitoring event. The ASD was certified by a South Carolina-registered professional engineer. As required by 40 CFR §257.94(e)(2), a copy of the ASD is

included in this Report and provided in **Appendix B**. DESC continued with detection monitoring in accordance with 40 CFR §257.94.

- Conducted the second semiannual 2023 detection monitoring on October 2, 2023, in accordance with the revised groundwater monitoring system, and completed the sample analyses on October 19, 2023, pursuant to the CCR Rule [§257.94(b)].
- Completed a baseline statistical evaluation in November 2023 to meet the requirements of 40 CFR 257.91 for the revised EPA CCR Compliance Monitoring Well Network.
- The Unit remained in detection monitoring for the duration of 2023.

1.4 Monitoring Program Concerns

There were no monitoring program concerns identified during 2023.

Section 2

Site Information

2.1 Monitoring Well Network

Groundwater monitoring wells (MW-LF-01, MW-LF-02, MW-LF-03, MW-LF-04, MW-LF-05, and MW-LF-06) were installed and developed at the Unit in March 2016 to serve as the EPA CCR Compliance Monitoring Well Network. Existing monitoring wells MW-BG-06 and MW-BG-16, utilized for other monitoring programs for the Unit, were incorporated into the CCR Compliance Monitoring Well Network in November 2016. Two additional groundwater monitoring wells, AS-LF-01 and AS-LF-02, that were installed in November 2017, and one existing monitoring well, MW-40, served as ASD support monitoring wells for SSIs observed during Detection Monitoring in September and October 2017. Both AS-LF-01 and AS-LF-02 were incorporated into the CCR Compliance Monitoring Well Network in December 2017. Groundwater monitoring well MW-40 was used to support potential ASD activities.

From July 2022 through September 2023, TRC performed a network evaluation to assess the current CCR monitoring well network for the Unit. As part of the evaluation, four new groundwater monitoring wells (MW-LF-07, MW-LF-08, MW-LF-09, and MW-LF-10) were installed in January 2023 and were used to assist with groundwater flow of the Unit while the network evaluation was being performed. Based on this evaluation, the following revisions were made to refine the CCR monitoring well network:

- MW-BG-06 and MW-BG-16 were removed from the CCR monitoring well network and repurposed for the measurement of water levels only. Both wells were determined to not be ideally located upgradient of the Unit.
- MW-LF-02 was removed from the CCR monitoring well network and repurposed for the measurement of water levels only. This well was determined to not monitor groundwater passing beneath the Unit.
- MW-LF-05 and MW-LF-06 were removed from the CCR monitoring well network and repurposed for the measurement of water levels only. Both wells were not positioned to monitor groundwater at the Unit boundary and were replaced with new monitoring wells MW-LF-07 and MW-LF-08, which were installed at the Unit boundary.
- New monitoring wells MW-LF-09 and MW-LF-10 were installed along the northern edge of the Unit boundary as previously no coverage existed in this area. MW-LF-09 was incorporated into the CCR monitoring well network. MW-LF-10 was determined to not be downgradient of the Unit and was selected for the purpose of measuring water levels only.

Pursuant to 40 CFR §257.91, the new monitoring wells were sampled monthly from January 2023 to August 2023. Sampling of monitoring well MW-LF-10 was suspended in March 2023 as it was determined that this well was not located downgradient of the Unit.

Given that the CCR monitoring well network evaluation was ongoing during the first 2023 semiannual sampling event, the Compliance Monitoring Well Network for the first 2023 semiannual sampling event consisted of the following monitoring wells:

- Background monitoring wells - MW-LF-01, MW-BG-06, MW-BG-16, AS-LF-01, and AS-LF-02.
- Downgradient monitoring wells - MW-LF-02, MW-LF-03, MW-LF-04, MW-LF-05, and MW-LF-06.

The location of the EPA CCR Rule Compliance Monitoring Well Network for the March 2023 semiannual sampling event is presented on **Figure 2**.

The monitoring well network was formally updated and certified in September 2023 (TRC, 2023b) to ensure the groundwater monitoring well network met the requirements of 40 CFR 257.91. The Compliance Monitoring Well Network for the second 2023 semiannual sampling event consisted of the following monitoring wells:

- Background monitoring wells - MW-LF-01, AS-LF-01, and AS-LF-02.
- Downgradient monitoring wells - MW-LF-03, MW-LF-04, MW-LF-07, MW-LF-08, and MW-LF-09.

The location of the EPA CCR Rule Compliance Monitoring Well Network for the October 2023 semiannual sampling event is presented on **Figure 3**.

2.2 Monitoring Well Installation and Decommissioning Activities

Four groundwater monitoring wells were installed during 2023 which include MW-LF-07, MW-LF-08, MW-LF-09, and MW-LF-10. Monitoring wells MW-LF-07, MW-LF-08, and MW-LF-09 were incorporated into the certified groundwater monitoring system.

No groundwater monitoring wells were decommissioned during 2023.

2.3 Groundwater Potentiometric Surface Evaluation

Current and historic static water level data for the Station are summarized in **Table 1**. Per requirements of 40 CFR §257.93(c), the rate and direction of groundwater flow within the uppermost aquifer beneath the Unit must be determined after each sampling event. Groundwater potentiometric surface maps were prepared using water level data obtained from both semiannual sampling events conducted in

March and October 2023. Using the groundwater contours from March (**Figure 4**) and October (**Figure 5**), the average horizontal hydraulic gradient was calculated using the following equation:

$$i = (h^1 - h^2)/S$$

Where:

- i = horizontal hydraulic gradient (unitless)
- h^1 = water elevation in well 1 (feet)
- h^2 = water elevation in well 2 (feet)
- S = horizontal distance between well 1 and well 2 (feet)

The groundwater seepage velocity was calculated using the following formula:

$$Vs = ki/n_e$$

Where:

- Vs = Groundwater seepage velocity (feet/day)
- k = hydraulic conductivity (feet/day)
- i = horizontal hydraulic gradient (unitless)
- n_e = effective porosity (percent)

The result for each semiannual event is presented separately in Sections 2.3.1 and 2.3.2. As presented, the estimated groundwater seepage velocity in the uppermost aquifer beneath the Unit is approximately 119 to 124 ft/year. Furthermore, the overall interpreted data indicates that the groundwater flow direction and velocity remain consistent with previous calculations for the Unit. The groundwater monitoring network continues to monitor the uppermost aquifer in accordance with the CCR Rule.

2.3.1 First Semiannual 2023 Detection Monitoring Program

The groundwater potentiometric surface map for March 2023 is presented in **Figure 4**. Using an estimated effective porosity value of 18% and an estimated average hydraulic conductivity value of 9.50 ft/day, the average rate of groundwater flow for the uppermost aquifer beneath the Unit was calculated to be 124.27 ft/year.

Well 1	Well 2	h^1 (ft)	h^2 (ft)	S (ft)	i	K (ft/day) (1)	n_e	Vs (ft/day)	Vs (ft/yr.)
MW-LF-01	MW-LF-08	170.04	161.55	1,490	0.0057	9.50	0.18	0.3008	109.79
AS-LF-01	MW-32	168.64	158.74	1,720	0.0058			0.3038	110.90
MW-LF-03	MW-LF-04	165.34	161.99	440	0.0076			0.4031	147.14
MW-LF-10	MW-LF-09	165.75	163.57	325	0.0067			0.3541	129.24
1) Hydraulic conductivity and effective porosity values from February 2021: Analysis of Groundwater Flow Rate and Direction – Class III Landfill Wells (Nautilus 2021). Results from the March 2023 slug test conducted by TRC are also included in the hydraulic conductivity estimate (TRC 2023a).						Average		0.3405	124.27

2.3.2 Second Semiannual 2023 Detection Monitoring Program

The groundwater potentiometric surface map for October 2023 is presented in **Figure 5**. Using an estimated effective porosity value of 18% and estimated average hydraulic conductivity value of 9.50 ft/day, the average rate of groundwater flow for the uppermost aquifer beneath the Unit was calculated to be 119.32 ft/year.

Well 1	Well 2	h ¹ (ft)	h ² (ft)	S (ft)	i	K (ft/day) ⁽¹⁾	n _e	V _s (ft/day)	V _s (ft/yr.)
MW-LF-01	MW-LF-08	168.17	160.57	1,490	0.0051	9.50	0.18	0.2693	98.28
AS-LF-01	MW-32	168.03	157.71	1,720	0.0060			0.3167	115.61
MW-LF-03	MW-LF-04	164.19	160.73	440	0.0079			0.4163	151.95
MW-LF-10	MW-LF-09	164.05	162.17	325	0.0058			0.3054	111.46
1) Hydraulic conductivity and effective porosity values from February 2021: Analysis of Groundwater Flow Rate and Direction – Class III Landfill Wells (Nautilus 2021). Results from the March 2023 slug test conducted by TRC are also included in the hydraulic conductivity estimate (TRC 2023a).						Average		0.3269	119.32

Section 3

Field Activities

CCR-related groundwater sampling activities that occurred during 2023 are summarized in the following sections.

3.1 Compliance Monitoring Program Sampling Activities

As per 40 CFR §257.94(c), two semiannual DMP events were completed for the constituents and parameters listed in Appendix III of the CCR Rule. Summaries of the 2023 DMP sampling events are presented below.

2023 Monitoring Event	Sample Dates	Final Laboratory Package Receipt Date
First Semiannual Detection Monitoring Program Event	March 7-9, 2023	March 22, 2023 (Revised April 18, 2023)
Second Semiannual Detection Monitoring Program Event	October 2, 2023	October 19, 2023

During each of the DMP sampling events, the compliance monitoring wells were sampled in accordance with the Station's Groundwater Monitoring Plan (GMP).

Samples collected during the semiannual sampling events were submitted to GEL Laboratories (GEL) in Charleston, South Carolina under proper chain-of-custody procedures. GEL is a SC DHEC Environmental Laboratory Certification Program (ELCP) accredited laboratory for analysis of CCR Rule constituents (GEL certification #10120001).

Section 4

Laboratory Analytical Results

Laboratory analytical results from the DMP sampling events conducted in 2023 are summarized in the following sections.

4.1 First Semiannual 2023 Detection Monitoring Program Event

The groundwater samples collected during the first semiannual DMP event were analyzed by GEL for the constituents and parameters listed in Appendix III of the CCR Rule. The laboratory certificates of analysis, chain-of-custody forms, and field notes for the sampling event are presented in **Appendix C**. A summary of the CCR sampling data for the Unit is included in **Table 2**.

4.2 Second Semiannual 2023 Detection Monitoring Program Event

The groundwater sampling collected during the second semiannual DMP event were analyzed by GEL for the constituents and parameters listed in Appendix III of the CCR Rule. The laboratory certificates of analysis, chain-of-custody forms, and field notes for the sampling event are presented in **Appendix D**. A summary of the CCR sampling data for the Unit is included in **Table 3**.

Section 5

Data Quality Validation

Third-party data validation services were provided by Environmental Standards, Inc. for the DMP sampling events. The reviews were performed with guidance from the USEPA data validation guidelines. A discussion of the findings is presented below.

5.1 First Semiannual 2023 Compliance Event Findings

The following field quality assurance (QA) and quality control (QC) samples for this event included:

- One blind duplicate sample was collected from monitoring well MW-40 on March 8, 2023.
- Additional sample volume was collected at MW-LF-05 on March 7, 2023, to allow for the laboratory to conduct a matrix spike (MS) and matrix spike duplicate (MSD) quality control check.
- A field blank was collected in the area of MW-LF-01 on March 7, 2023, using laboratory provided deionized water. The field blank was used to assess for potential contaminants from field conditions during sampling activities.
- A field blank was collected in the area of AS-LF-01 on March 9, 2023, using laboratory provided deionized water. The field blank was used to assess for potential contaminants from field conditions during sampling activities.

These QA/QC samples were analyzed for the same constituents as the groundwater samples. Based on review of the laboratory-provided QC data and Environmental Standards recommendations, the data for this sampling event were determined to meet the data quality objectives for the project with the provided data qualifiers. A copy of the data validation report is included in **Appendix C**.

5.2 Second Semiannual 2023 Compliance Event Findings

The following field QA/QC samples for this event included:

- One blind duplicate sample was collected from the MW-LF-07 location on October 2, 2023.
- Additional sample volume was collected at MW-LF-09 on October 2, 2023, to allow for the laboratory to conduct a MS/MSD quality control check.
- A field blank was collected in the area of AS-LF-01 on October 2, 2023, using laboratory provided deionized water. The field blank was used to assess for potential contaminants from field conditions during sampling activities.

These QA/QC samples were analyzed for the same constituents as the groundwater samples. Based on review of the laboratory-provided QC data and Environmental Standards recommendations, the data for this sampling event were determined to meet the data quality objectives for the project with the provided data qualifiers. A copy of the data validation report is included in **Appendix D**.

Section 6

Statistical Evaluation of Groundwater Data

Statistical evaluation of the semiannual DMP data was performed in accordance with the statistical method certified by a qualified South Carolina-registered professional engineer. The certified statistical method has been posted to the Unit's operating record. Statistical evaluations completed in 2023 are summarized in the following sections.

6.1 Site-Specific Background Evaluations

Compliance data from each semiannual event was evaluated against site-specific background values as follows.

6.1.1 First Semiannual 2023 Compliance Event

Pursuant to 40 CFR §257.95, TRC evaluated Appendix III constituent detections against site-specific background values that were established for the DMP (**Appendix E**). Based on that evaluation, the following Appendix III SSI was identified for the first semiannual 2023 event (**Table 2**):

- Chloride (MW-LF-02)

An ASD and certification were prepared for this SSI and is attached as **Appendix B**.

6.1.2 Second Semiannual 2023 Compliance Event

Pursuant to 40 CFR §257.95, TRC evaluated Appendix III constituent detections against site-specific background values that were established for the DMP (**Appendix F**). The specific background values were updated for the new certified network established in September 2023. Based on that evaluation, the following Appendix III SSIs were identified for the second semiannual 2023 event (**Table 3**):

- Calcium (MW-LF-07)
- Fluoride (MW-LF-07)
- pH (MW-LF-07 and MW-LF-08)
- TDS (MW-LF-07)

Section 7

Conclusions

7.1 Findings

The first semiannual 2023 DMP compliance sampling event was conducted on March 7 - 9, 2023, with sample analyses completed on March 22, 2023. The second semiannual 2023 DMP compliance sampling event was conducted on October 2, 2023, with sample analyses complete on October 19, 2023. These groundwater sampling and analysis activities were performed in general accordance with the requirements of the Unit's GMP for the CCR Rule network.

Evaluation of the monitoring results from the first semiannual 2023 event identified an exceedance above the background value for chloride in MW-LF-02. DESC completed a successful ASD for the potential SSI identified during the first semiannual 2023 detection monitoring event. The ASD was certified by a South Carolina-registered professional engineer and presented in this Report (**Appendix B**). Monitoring results from the second semiannual 2023 event identified exceedances above the background value for calcium, fluoride, pH, and TDS in MW-LF-07 and pH in MW-LF-08.

7.2 Planned Activities

Based on the results from the 2023 monitoring activities, DESC intends to initiate the assessment monitoring program during the first quarter of 2024 for the Unit pursuant to 40 CFR §257.95.

Section 8

References

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- TRC 2023b. Groundwater Monitoring System Certification, Cope Station Class III Landfill. Cope, South Carolina: TRC Environmental Corporation.
- TRC 2023c. Baseline Statistical Evaluation Report, Cope Station Class III Landfill. Cope, South Carolina: TRC Environmental Corporation

Section 9 Signature Page

This 2023 CCR Annual Groundwater Monitoring and Corrective Action Report (Report) has been prepared by a qualified groundwater scientist on behalf of Dominion Energy South Carolina (DESC) for the Class III Industrial Landfill at Cope Generating Station. This Report satisfied the reporting requirements specified in Title 40 CFR §257.90(e) *et seq.* [Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule; Federal Register Vol. 80, No. 74, 21302-21501 on April 17, 2015, as amended)].

Name: Richard A. Mayer Jr., P.G.

Expiration Date: June 30, 2025

Company: TRC Environmental Corporation

Date: January 31, 2024



(SEAL)

Tables

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-LF-01	176.41	5/12/2016	7.56	168.85
		7/14/2016	8.82	167.59
		9/14/2016	8.13	168.28
		11/8/2016	8.48	167.93
		1/25/2017	5.95	170.46
		3/29/2017	7.08	169.33
		5/15/2017	6.84	169.57
		7/27/2017	9.40	167.01
		9/25/2017	9.68	166.73
		10/12/2017	10.51	165.90
		10/30/2017	10.19	166.22
		12/11/2017	9.01	167.40
		12/19/2017	8.81	167.60
		12/28/2017	8.24	168.17
		2/21/2018	8.29	168.12
		3/21/2018	8.49	167.92
		9/17/2018	8.21	168.20
		3/20/2019	5.89	170.52
		9/20/2019	9.88	166.53
		3/16/2020	4.86	171.55
		9/21/2020	7.97	168.44
		3/15/2021	5.31	171.10
		9/28/2021	9.92	166.49
		3/8/2022	8.60	167.81
		8/24/2022	9.63	166.78
		1/18/2023	9.25	167.16
		2/14/2023	5.57	170.84
		3/7/2023	6.37	170.04
4/11/2023	5.74	170.67		
5/19/2023	6.76	169.65		
6/14/2023	7.15	169.26		
7/18/2023	7.15	169.26		
8/15/2023	7.45	168.96		
10/2/2023	8.24	168.17		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-LF-02	190.08	5/12/2016	25.38	164.70
		7/14/2016	26.30	163.78
		9/14/2016	25.40	164.68
		11/8/2016	26.68	163.40
		1/25/2017	23.82	166.26
		3/29/2017	25.61	164.47
		5/15/2017	24.88	165.20
		7/27/2017	26.86	163.22
		9/25/2017	27.00	163.08
		10/12/2017	27.81	162.27
		10/30/2017	27.35	162.73
		12/11/2017	26.00	164.08
		12/19/2017	26.62	163.46
		12/28/2017	26.65	163.43
		2/21/2018	26.82	163.26
		3/21/2018	27.22	162.86
		9/18/2018	25.54	164.54
		3/20/2019	23.53	166.55
		9/19/2019	26.30	163.78
		3/16/2020	21.67	168.41
		9/21/2020	23.74	166.34
		3/16/2021	22.12	167.96
		9/28/2021	26.06	164.02
		3/8/2022	26.18	163.90
		8/24/2022	25.87	164.21
		3/7/2023	23.57	166.51
		4/11/2023	22.99	167.09
		5/19/2023	23.31	166.77
6/14/2023	23.81	166.27		
7/18/2023	23.49	166.59		
8/15/2023	23.77	166.31		
10/2/2023	24.33	165.75		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-LF-03	187.19	5/12/2016	23.34	163.85
		7/14/2016	24.53	162.66
		9/14/2016	23.60	163.59
		11/8/2016	24.61	162.58
		1/25/2017	22.78	164.41
		3/30/2017	23.99	163.20
		5/15/2017	23.25	163.94
		7/27/2017	25.33	161.86
		9/25/2017	25.68	161.51
		10/12/2017	26.31	160.88
		10/30/2017	26.14	161.05
		3/21/2018	25.86	161.33
		9/18/2018	23.96	163.23
		3/20/2019	22.30	164.89
		9/19/2019	25.35	161.84
		3/16/2020	19.75	167.44
		9/21/2020	23.44	163.75
		3/15/2021	20.45	166.74
		9/28/2021	24.95	162.24
		3/8/2022	24.85	162.34
		8/24/2022	24.64	162.55
		3/7/2023	21.85	165.34
		4/11/2023	22.09	165.10
		5/19/2023	21.63	165.56
		6/14/2023	22.42	164.77
7/18/2023	22.01	165.18		
8/15/2023	22.71	164.48		
10/2/2023	23.00	164.19		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-LF-04	184.20	5/12/2016	23.29	160.91
		7/14/2016	24.31	159.89
		9/14/2016	24.03	160.17
		11/8/2016	24.03	160.17
		1/25/2017	22.78	161.42
		3/30/2017	23.49	160.71
		5/15/2017	23.18	161.02
		7/27/2017	24.86	159.34
		9/25/2017	25.44	158.76
		10/12/2017	25.86	158.34
		10/30/2017	25.87	158.33
		3/21/2018	25.12	159.08
		9/18/2018	23.90	160.30
		3/20/2019	22.53	161.67
		9/19/2019	25.22	158.98
		3/16/2020	20.77	163.43
		9/21/2020	24.23	159.97
		3/16/2021	21.01	163.19
		9/28/2021	24.65	159.55
		3/8/2022	24.39	159.81
		8/24/2022	24.48	159.72
		3/7/2023	22.21	161.99
		4/11/2023	22.22	161.98
		5/19/2023	22.37	161.83
		6/14/2023	22.91	161.29
7/18/2023	22.69	161.51		
8/15/2023	23.02	161.18		
10/2/2023	23.47	160.73		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-LF-05	177.95	5/12/2016	20.36	157.59
		7/14/2016	21.25	156.70
		9/14/2016	20.83	157.12
		11/8/2016	20.75	157.20
		1/25/2017	19.41	158.54
		3/30/2017	20.18	157.77
		5/15/2017	20.08	157.87
		7/27/2017	21.28	156.67
		9/25/2017	21.84	156.11
		10/12/2017	22.10	155.85
		10/30/2017	21.94	156.01
		3/21/2018	21.00	156.95
		9/18/2018	21.67	156.28
		3/20/2019	19.61	158.34
		9/19/2019	21.85	156.10
		3/16/2020	18.64	159.31
		9/18/2020	20.87	157.08
		3/15/2021	18.74	159.21
		9/28/2021	21.20	156.75
		3/8/2022	20.75	157.20
		8/24/2022	21.14	156.81
		3/7/2023	19.50	158.45
		4/11/2023	19.16	158.79
		5/19/2023	19.53	158.42
6/14/2023	19.95	158.00		
7/18/2023	19.82	158.13		
8/15/2023	20.10	157.85		
10/2/2023	20.56	157.39		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-LF-06	178.57	5/12/2016	19.12	159.45
		7/14/2016	20.07	158.50
		9/15/2016	20.41	158.16
		11/8/2016	19.88	158.69
		1/25/2017	18.76	159.81
		3/30/2017	19.18	159.39
		5/15/2017	19.01	159.56
		7/27/2017	20.40	158.17
		9/26/2017	21.19	157.38
		10/12/2017	21.39	157.18
		10/30/2017	21.41	157.16
		3/21/2018	20.59	157.98
		9/18/2018	19.85	158.72
		3/20/2019	18.59	159.98
		9/19/2019	21.00	157.57
		3/16/2020	17.22	161.35
		9/18/2020	20.39	158.18
		3/16/2021	17.53	161.04
		9/28/2021	20.49	158.08
		3/8/2022	20.26	158.31
		8/24/2022	20.45	158.12
		3/7/2023	18.77	159.80
		4/11/2023	18.62	159.95
		5/19/2023	18.79	159.78
6/14/2023	19.17	159.40		
7/18/2023	19.07	159.50		
8/15/2023	19.85	158.72		
10/2/2023	19.82	158.75		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-BG-06	187.95	11/8/2016	12.82	175.13
		1/26/2017	10.76	177.19
		3/29/2017	12.55	175.40
		5/16/2017	12.93	175.02
		7/28/2017	15.88	172.07
		9/26/2017	16.28	171.67
		10/10/2017	16.72	171.23
		10/30/2017	16.15	171.80
		2/22/2018	13.48	174.47
		3/21/2018	13.48	174.47
		9/17/2018	14.49	173.46
		3/21/2019	12.44	175.51
		9/19/2019	16.75	171.20
		3/16/2020	11.45	176.50
		9/18/2020	13.79	174.16
		3/15/2021	11.59	176.36
		9/28/2021	16.30	171.65
		3/8/2022	14.48	173.47
		8/24/2022	16.93	171.02
		3/7/2023	13.65	174.30
		4/11/2023	13.41	174.54
		5/19/2023	14.02	173.93
6/14/2023	14.53	173.42		
7/18/2023	14.76	173.19		
8/15/2023	14.88	173.07		
10/2/2023	15.75	172.20		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-BG-16	182.52	11/8/2016	9.06	173.46
		1/26/2017	7.63	174.89
		3/29/2017	8.22	174.30
		5/16/2017	8.63	173.89
		7/28/2017	10.60	171.92
		9/26/2017	11.24	171.28
		10/10/2017	11.72	170.80
		10/30/2017	11.36	171.16
		2/22/2018	10.27	172.25
		3/21/2018	10.25	172.27
		9/17/2018	10.45	172.07
		3/21/2019	8.49	174.03
		9/19/2019	12.25	170.27
		3/16/2020	8.28	174.24
		9/18/2020	9.92	172.60
		3/16/2021	8.33	174.19
		9/28/2021	12.01	170.51
		3/8/2022	10.98	171.54
		8/24/2022	12.50	170.02
		3/7/2023	10.13	172.39
		4/11/2023	9.26	173.26
		5/19/2023	10.11	172.41
		6/14/2023	10.67	171.85
7/18/2023	10.76	171.76		
8/15/2023	10.98	171.54		
10/2/2023	11.56	170.96		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
AS-LF-01	174.75	12/11/2017	11.50	163.25
		12/19/2017	14.15	160.60
		12/28/2017	13.81	160.94
		2/21/2018	13.77	160.98
		3/22/2018	14.08	160.67
		9/18/2018	12.73	162.02
		3/21/2019	11.48	163.27
		9/20/2019	10.13	164.62
		3/17/2020	8.11	166.64
		9/18/2020	10.69	164.06
		3/15/2021	7.65	167.10
		9/28/2021	10.81	163.94
		3/8/2022	10.75	164.00
		8/24/2022	10.69	164.06
		1/18/2023	10.90	163.85
		2/14/2023	8.19	166.56
		3/7/2023	8.71	166.04
		4/11/2023	8.15	166.60
		5/19/2023	8.52	166.23
		6/14/2023	8.68	166.07
7/18/2023	8.60	166.15		
8/15/2023	8.65	166.10		
10/2/2023	9.32	165.43		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
AS-LF-02	175.38	12/11/2017	10.91	164.47
		12/19/2017	11.14	164.24
		12/28/2017	10.67	164.71
		2/21/2018	10.80	164.58
		3/22/2018	10.98	164.40
		9/18/2018	9.94	165.44
		3/21/2019	7.89	167.49
		9/20/2019	10.41	164.97
		3/17/2020	7.36	168.02
		9/18/2020	8.77	166.61
		3/16/2021	7.66	167.72
		9/28/2021	10.54	164.84
		3/8/2022	10.41	164.97
		8/24/2022	10.46	164.92
		1/18/2023	10.53	164.85
		2/14/2023	7.75	167.63
		3/7/2023	8.49	166.89
		4/11/2023	7.79	167.59
		5/19/2023	8.34	167.04
		6/14/2023	8.44	166.94
7/18/2023	8.38	167.00		
8/15/2023	8.41	166.97		
10/2/2023	9.14	166.24		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-40	177.28	12/11/2017	12.03	165.25
		12/19/2017	12.11	165.17
		12/28/2017	11.82	165.46
		2/21/2018	11.82	165.46
		3/21/2018	12.13	165.15
		9/17/2018	10.75	166.53
		3/21/2019	11.57	165.71
		9/20/2019	11.13	166.15
		9/20/2019	11.13	166.15
		3/17/2020	7.46	169.82
		9/18/2020	9.70	167.58
		3/16/2021	7.95	169.33
		9/28/2021	11.21	166.07
		3/8/2022	11.18	166.10
		8/24/2022	11.04	166.24
		3/7/2023	9.03	168.25
		4/11/2023	8.69	168.59
		5/19/2023	8.94	168.34
		6/14/2023	9.29	167.99
		7/18/2023	9.02	168.26
8/15/2023	9.15	168.13		
10/2/2023	9.74	167.54		

Notes:

1) ft AMSL = feet above mean sea level.

Table 1
Summary of Historical CCR Static Water Level Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Monitoring Well ID	Top of Casing Elevation (ft. AMSL)	Date	Depth to Water (feet)	Static Water Level Elevation (ft. AMSL)
MW-LF-07	180.11	2/15/2023	19.50	160.61
		3/7/2023	19.11	161.00
		4/11/2023	19.03	161.08
		5/19/2023	19.00	161.11
		6/14/2023	19.43	160.68
		7/18/2023	19.36	160.75
		8/15/2023	19.68	160.43
		10/2/2023	20.07	160.04
MW-LF-08	182.17	2/15/2023	21.10	161.07
		3/7/2023	20.62	161.55
		4/11/2023	20.49	161.68
		5/19/2023	20.44	161.73
		6/14/2023	20.91	161.26
		7/18/2023	20.91	161.26
		8/15/2023	21.24	160.93
		10/2/2023	21.60	160.57
MW-LF-09	177.89	2/15/2023	14.31	163.58
		3/7/2023	14.32	163.57
		4/11/2023	13.88	164.01
		5/19/2023	14.23	163.66
		6/14/2023	14.89	163.00
		7/18/2023	14.91	162.98
		8/15/2023	15.27	162.62
		10/2/2023	15.72	162.17
MW-LF-10	178.52	2/15/2023	11.81	166.71
		3/7/2023	12.77	165.75
		4/11/2023	11.75	166.77
		5/19/2023	12.89	165.63
		6/14/2023	13.57	164.95
		7/18/2023	13.58	164.94
		8/15/2023	13.90	164.62
		10/2/2023	14.47	164.05

Notes:

1) ft AMSL = feet above mean sea level.

Table 2
Summary of First Semiannual 2023 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	Background Wells																				Downgradient Well			
			MW-LF-01				MW-BG-06				MW-BG-16				AS-LF-01				AS-LF-02				MW-LF-02			
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL
CCR Appendix III																										
Boron	µg/L	200	9.44	J	4.00	15.0	8.89	J	4.00	15.0	8.72	J	4.00	15.0	9.13	J	4.00	15.0	12.2	J	4.00	15.0	16.7		4.00	15.0
Calcium	µg/L	15,800	2,320	J+	30.0	100	9,510	J+	30.0	100	2,480	J+	30.0	100	3,570		30.0	100	3,280		30.0	100	5,080	J+	30.0	100
Chloride	mg/L	21.9	7.97		0.0670	0.200	17.8		0.335	1.00	5.20		0.0670	0.200	3.66		0.0670	0.200	8.05		0.0670	0.200	27.7		0.335	1.00
Fluoride	mg/L	0.225	0.0575	J	0.0330	0.100	0.0806	J	0.0330	0.100	0.0330	U	0.0330	0.100	0.0992	J	0.0330	0.100	0.0815	J	0.0330	0.100	0.224		0.0330	0.100
pH	SU	3.4 - 5.8	4.55		0.01	0.01	4.34		0.01	0.01	4.61		0.01	0.01	4.57		0.01	0.01	4.46		0.01	0.01	4.08		0.01	0.01
Sulfate	mg/L	21.6	0.196	J	0.133	0.400	0.239	J	0.133	0.400	1.87		0.133	0.400	15.0		0.133	0.400	10.3		0.133	0.400	8.32		0.133	0.400
Total Dissolved Solids	mg/L	141.3	2.38	U	2.38	10.0	65.0		2.38	10.0	20.0		2.38	10.0	11.0		2.38	10.0	12.0		2.38	10.0	46.0		2.38	10.0
Field Parameters																										
Conductivity	µS/cm	--	43.60		0.1	0.1	171.36		0.1	0.1	52.68		0.1	0.1	57.98		0.1	0.1	72.29		0.1	0.1	151.93		0.1	0.1
Dissolved Oxygen	mg/L	--	2.45		0.01	0.01	5.82		0.01	0.01	6.37		0.01	0.01	5.70		0.01	0.01	4.80		0.01	0.01	0.25		0.01	0.01
Oxidation Reduction Potential	millivolts	--	56.6		0.1	0.1	153.0		0.1	0.1	161.2		0.1	0.1	157.6		0.1	0.1	202.9		0.1	0.1	400.3		0.1	0.1
Temperature	C	--	20.71		0.01	0.01	17.8		0.01	0.01	18.41		0.01	0.01	19.71		0.01	0.01	19.63		0.01	0.01	23.90		0.01	0.01
Turbidity	NTU	--	2.60		0.1	0.1	0.36		0.1	0.1	0.57		0.1	0.1	0.70		0.1	0.1	1.47		0.1	0.1	0.54		0.1	0.1

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit

Qualifiers (Qual)
J = Estimated Results
U = Samples reported below their respective MDL
J+ = Estimated results biased high
 = Concentration greater than Background Threshold Values

Bold font = Detected constituent

Table 2
Summary of First Semiannual 2023 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	ASD Support Well								Downgradient Wells																		
			MW-40				MW-40 DUP				MW-LF-03				MW-LF-04				MW-LF-05				MW-LF-06						
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL			
		Sample ID:	03/08/2023								03/07/2023				03/07/2023				03/07/2023				03/07/2023						
		Sample Date:	03/08/2023								03/07/2023				03/07/2023				03/07/2023				03/07/2023						
CCR Appendix III																													
Boron	µg/L	200	41.8		4.00	15.0	38.2		4.00	15.0	8.28	J	4.00	15.0	9.09	J	4.00	15.0	11.2	J	4.00	15.0	9.52	J	4.00	15.0			
Calcium	µg/L	15,800	37,000	J+	30.0	100	35,900	J+	30.0	100	1,510	J+	30.0	100	2,070	J+	30.0	100	2,910	J+	30.0	100	2,190	J+	30.0	100			
Chloride	mg/L	21.9	43.6		1.34	4.00	43.5		1.34	4.00	3.18		0.0670	0.200	4.72		0.0670	0.200	9.28		0.0670	0.200	8.77		0.0670	0.200			
Fluoride	mg/L	0.225	0.886	J	0.0330	0.100	1.09	J	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0696	J	0.0330	0.100	0.0362	J	0.0330	0.100			
pH	SU	3.4 - 5.8	4.04		0.01	0.01	4.04		0.01	0.01	4.53		0.01	0.01	4.53		0.01	0.01	4.32		0.01	0.01	4.46		0.01	0.01			
Sulfate	mg/L	21.6	169		2.66	8.00	177		2.66	8.00	0.613		0.133	0.400	2.46		0.133	0.400	0.489		0.133	0.400	0.596		0.133	0.400			
Total Dissolved Solids	mg/L	141.3	287		2.38	10.0	294		2.38	10.0	2.38	U	2.38	10.0	17.0		2.38	10.0	12.0		2.38	10.0	9.00	J	2.38	10.0			
Field Parameters																													
Conductivity	µS/cm	--	523.72		0.1	0.1	523.72		0.1	0.1	37.27		0.1	0.1	60.82		0.1	0.1	75.58		0.1	0.1	59.87		0.1	0.1			
Dissolved Oxygen	mg/L	--	0.28		0.01	0.01	0.28		0.01	0.01	3.29		0.01	0.01	5.15		0.01	0.01	4.55		0.01	0.01	4.10		0.01	0.01			
Oxidation Reduction Potential	millivolts	--	222.7		0.1	0.1	222.7		0.1	0.1	73.7		0.1	0.1	136.7		0.1	0.1	137.2		0.1	0.1	50.1		0.1	0.1			
Temperature	C	--	18.68		0.01	0.01	18.68		0.01	0.01	23.81		0.01	0.01	23.57		0.01	0.01	23.70		0.01	0.01	23.89		0.01	0.01			
Turbidity	NTU	--	0.57		0.1	0.1	0.57		0.1	0.1	0.57		0.1	0.1	12.28		0.1	0.1	1.69		0.1	0.1	2.92		0.1	0.1			

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit

Qualifiers (Qual)
J = Estimated Results
U = Samples reported below their respective MDL
J+ = Estimated results biased high
 = Concentration greater than Background Threshold Values

Bold font = Detected constituent

Table 3
Summary of Second Semiannual 2023 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	Background Wells												Downgradient Well			
			AS-LF-01				AS-LF-02				MW-LF-01				MW-LF-03			
			10/02/2023				10/02/2023				10/02/2023				10/02/2023			
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL
CCR Appendix III																		
Boron	µg/L	35.4	19.7		4.00	15.0	29.2		4.00	15.0	10.7	J	4.00	15.0	9.83	J	4.00	15.0
Calcium	µg/L	5,860	1,780		30.0	100	3,830		30.0	100	2,450		30.0	100	1,370		30.0	100
Chloride	mg/L	13.5	2.58		0.0670	0.200	6.63		0.0670	0.200	12.9		0.134	0.400	3.09		0.0670	0.200
Fluoride	mg/L	0.11	0.0571	J	0.0330	0.100	0.0776	J	0.0330	0.100	0.0695	J	0.0330	0.100	0.033	U	0.0330	0.100
pH	SU	4.0 - 4.9	4.42		0.01	0.01	4.41		0.01	0.01	4.34		0.01	0.01	4.64		0.01	0.01
Sulfate	mg/L	18.9	8.01		0.133	0.400	11.5		0.133	0.400	0.645		0.133	0.400	0.575		0.133	0.400
Total Dissolved Solids	mg/L	31.9	2.38	U	2.38	10.0	19.0		2.38	10.0	7.00	J	2.38	10.0	2.38	U	2.38	10.0
Field Parameters																		
Conductivity	µS/cm	--	44.7		0.1	0.1	73.14		0.1	0.1	66.53		0.1	0.1	38.42		0.1	0.1
Dissolved Oxygen	mg/L	--	4.35		0.01	0.01	3.22		0.01	0.01	1.35		0.01	0.01	2.72		0.01	0.01
Oxidation Reduction Potential	millivolts	--	236.7		0.1	0.1	223.5		0.1	0.1	256.8		0.1	0.1	134.8		0.1	0.1
Temperature	C	--	25.23		0.01	0.01	24.28		0.01	0.01	27.2		0.01	0.01	26.01		0.01	0.01
Turbidity	NTU	--	0.9		0.1	0.1	0.57		0.1	0.1	0.37		0.1	0.1	0.16		0.1	0.1

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit

Qualifiers (Qual)
J = Estimated Results
U = Samples reported below their respective MDL
= Concentration greater than Background Threshold Values

Bold font = Detected constituent

Table 3 (Continued)
Summary of Second Semiannual 2023 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	Downgradient Wells																			
			MW-LF-04				MW-LF-07				MW-LF-07 Duplicate				MW-LF-08				MW-LF-09			
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL
		Sample ID:																				
		Sample Date:	10/02/2023																			
CCR Appendix III																						
Boron	µg/L	35.4	11.6	J	4.00	15.0	9.80	J	4.00	15.0	9.47	J	4.00	15.0	11.0	J	4.00	15.0	8.75	J	4.00	15.0
Calcium	µg/L	5,860	1,340		30.0	100	21,300		30.0	100	21,600		30.0	100	5,160		30.0	100	698		30.0	100
Chloride	mg/L	13.5	3.52		0.0670	0.200	6.74		0.0670	0.200	6.68		0.0670	0.200	9.95		0.0670	0.200	2.74		0.0670	0.200
Fluoride	mg/L	0.11	0.033	U	0.0330	0.100	0.167		0.0330	0.100	0.146		0.0330	0.100	0.0626	J	0.0330	0.100	0.033	U	0.0330	0.100
pH	SU	4.0 - 4.9	4.62		0.01	0.01	6.52		0.01	0.01	--		--	--	5.00		0.01	0.01	4.74		0.01	0.01
Sulfate	mg/L	18.9	0.610		0.133	0.400	0.986		0.133	0.400	1.01		0.133	0.400	0.224	J	0.133	0.400	0.587		0.133	0.400
Total Dissolved Solids	mg/L	31.9	2.38	U	2.38	10.0	63.0		2.38	10.0	66.0		2.38	10.0	21.0		2.38	10.0	2.38	U	2.38	10.0
Field Parameters																						
Conductivity	µS/cm	--	42.13		0.1	0.1	138.94		0.1	0.1	--		--	--	68.35		0.1	0.1	26.22		0.1	0.1
Dissolved Oxygen	mg/L	--	5.39		0.01	0.01	2.05		0.01	0.01	--		--	--	5.34		0.01	0.01	7.29		0.01	0.01
Oxidation Reduction Potential	millivolts	--	132.2		0.1	0.1	107.9		0.1	0.1	--		--	--	125.7		0.1	0.1	225		0.1	0.1
Temperature	C	--	25.32		0.01	0.01	26.33		0.01	0.01	--		--	--	25.41		0.01	0.01	23.34		0.01	0.01
Turbidity	NTU	--	2.64		0.1	0.1	0.25		0.1	0.1	--		--	--	1.12		0.1	0.1	0.15		0.1	0.1

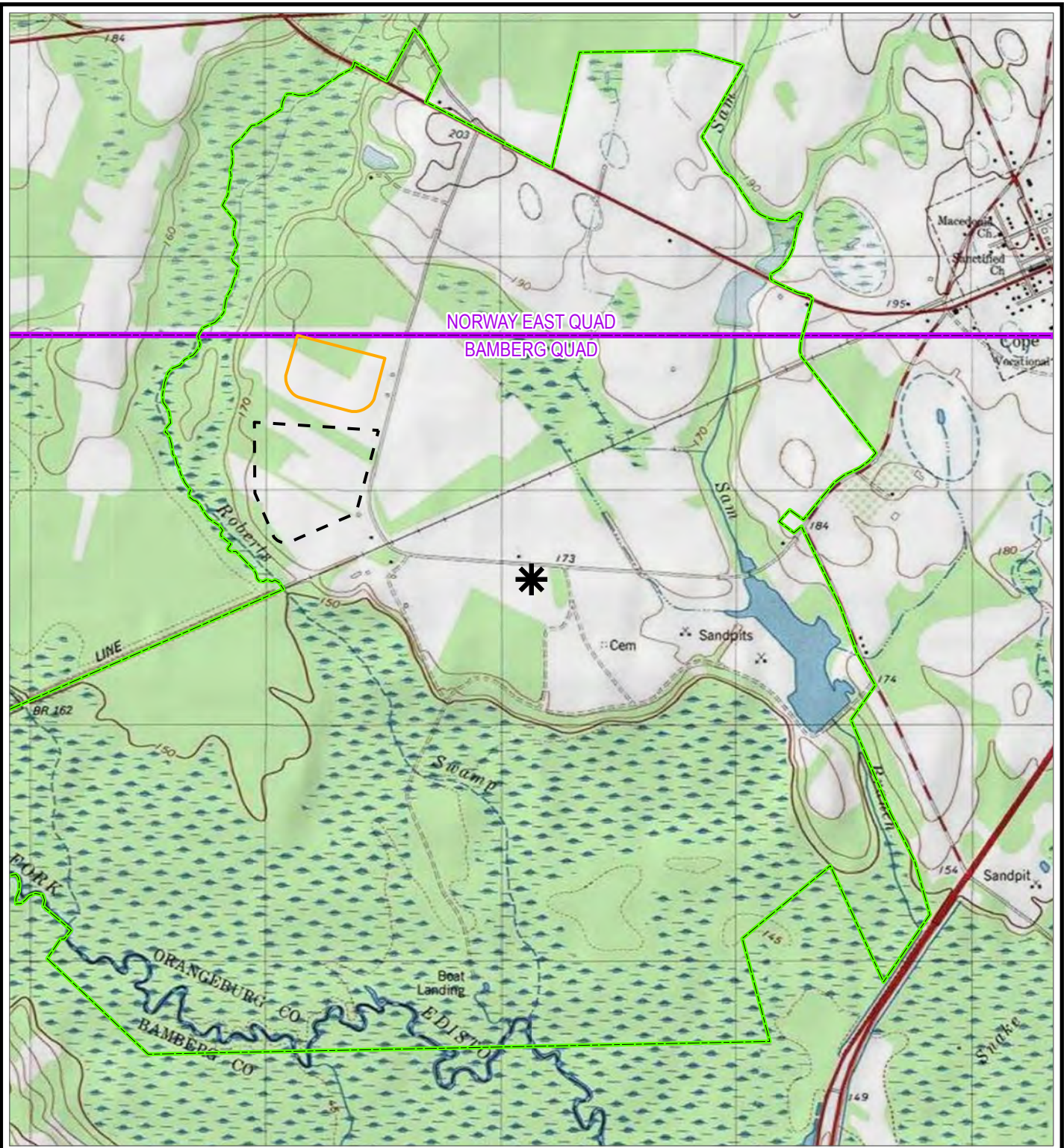
Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit

Qualifiers (Qual)
J = Estimated Results
U = Samples reported below their respective MDL
 = Concentration greater than Background Threshold Values






Bold font = Detected constituent

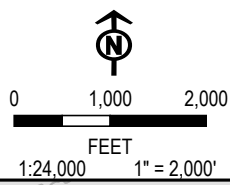
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LEGEND

-  SITE LOCATION
-  CLASS III LANDFILL
-  CLOSED CLASS II LANDFILL
-  PROPERTY BOUNDARY
-  7.5' USGS QUADRANGLE BOUNDARY



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TITLE:		SITE LOCATION MAP	
DRAWN BY:	H. BEST	PROJ. NO.:	416559.0007.0000
CHECKED BY:	A. KAILAS	FIGURE 1	
APPROVED BY:	J. YONTS		
DATE:	NOVEMBER 2023		
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FILE:		2023_FIGURES	

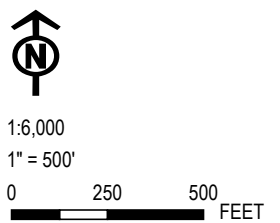
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 DATA SOURCES: TRC

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- LEGEND**
- CCR BACKGROUND MONITORING WELL
 - CCR DOWNGRAIDENT MONITORING WELL
 - CCR BACKGROUND ASD MONITORING WELL
 - NEW MONITORING WELL INSTALLATION LOCATION
 - EVENT PIEZOMETER
 - CLASS III LANDFILL
 - CLOSED CLASS II LANDFILL
 - PROPERTY BOUNDARY

NOTES:
 1. AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.



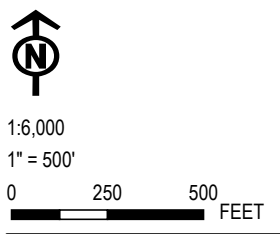
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TITLE:		CCR RULE COMPLIANCE MONITORING WELL NETWORK - MARCH 2023	
DRAWN BY:	H. BEST	PROJ. NO.:	416559.0007.0000
CHECKED BY:	A. KAILAS	FIGURE 2	
APPROVED BY:	J. YONTS		
DATE:	NOVEMBER 2023		
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		FILE:	2023_Figures.aprx

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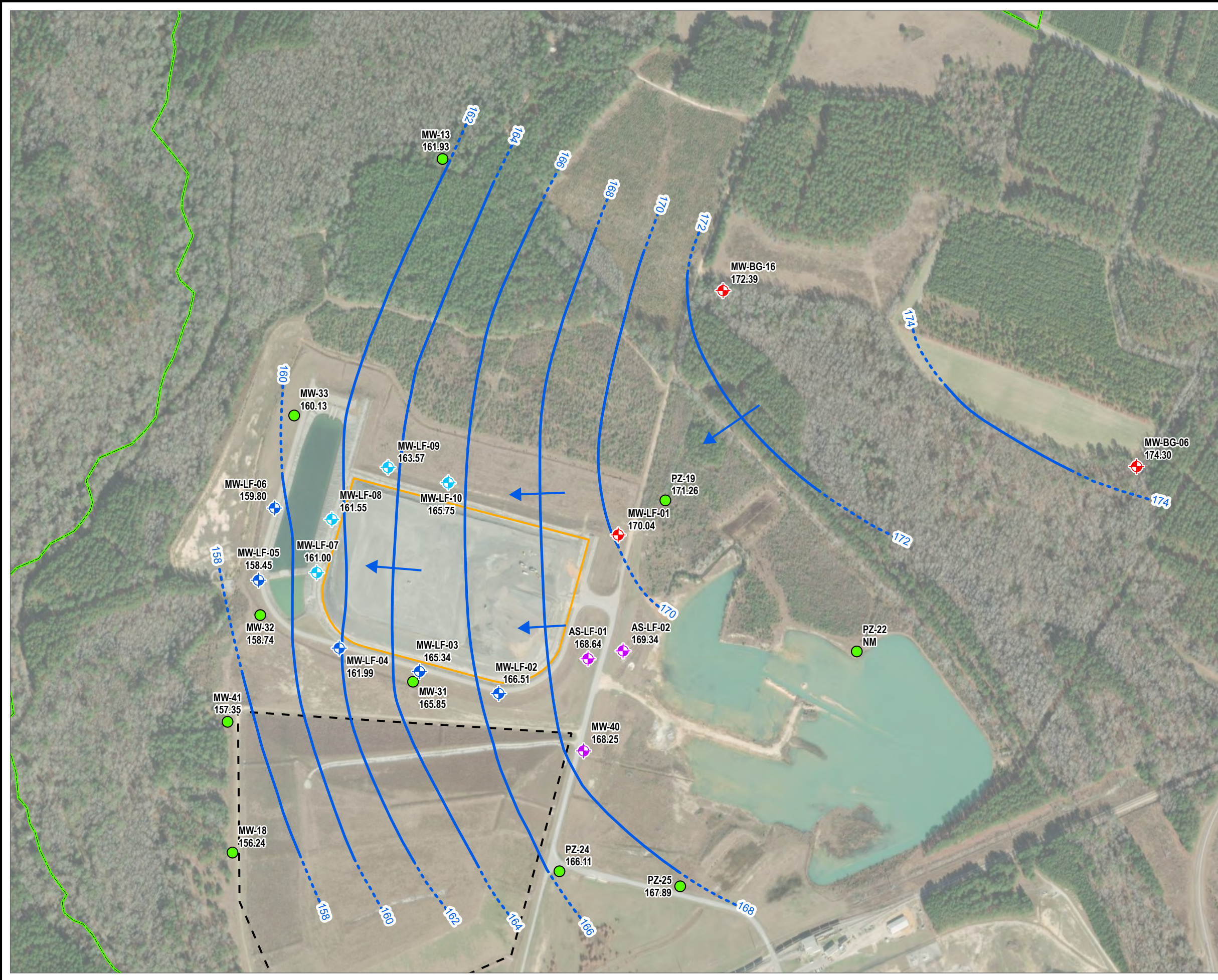
- LEGEND**
- CCR BACKGROUND MONITORING WELL
 - CCR DOWNGRAIDENT MONITORING WELL
 - EVENT PIEZOMETER
 - CLASS III LANDFILL
 - CLOSED CLASS II LANDFILL
 - PROPERTY BOUNDARY

NOTES:
 1. AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.



PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE:		CCR RULE COMPLIANCE MONITORING WELL NETWORK – OCTOBER 2023	
DRAWN BY:	H. BEST	PROJ. NO.:	416559.0007.0000
CHECKED BY:	A. KAILAS	FIGURE 3	
APPROVED BY:	J. YONTS		
DATE:	NOVEMBER 2023		
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LEGEND

- ◆ CCR BACKGROUND MONITORING WELL
 - ◆ CCR DOWNGRADIENT MONITORING WELL
 - ◆ CCR BACKGROUND ASD MONITORING WELL
 - ◆ NEW MONITORING WELL INSTALLATION LOCATION
 - EVENT PIEZOMETER
 - CLASS III LANDFILL
 - CLOSED CLASS II LANDFILL
 - PROPERTY BOUNDARY
 - WATER TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL (2' CONTOUR INTERVALS) - DASHED WHERE INFERRED
 - APPROXIMATE GROUNDWATER FLOW DIRECTION
- 169.34** WATER ELEVATION (FT. MSL)

NOTES:

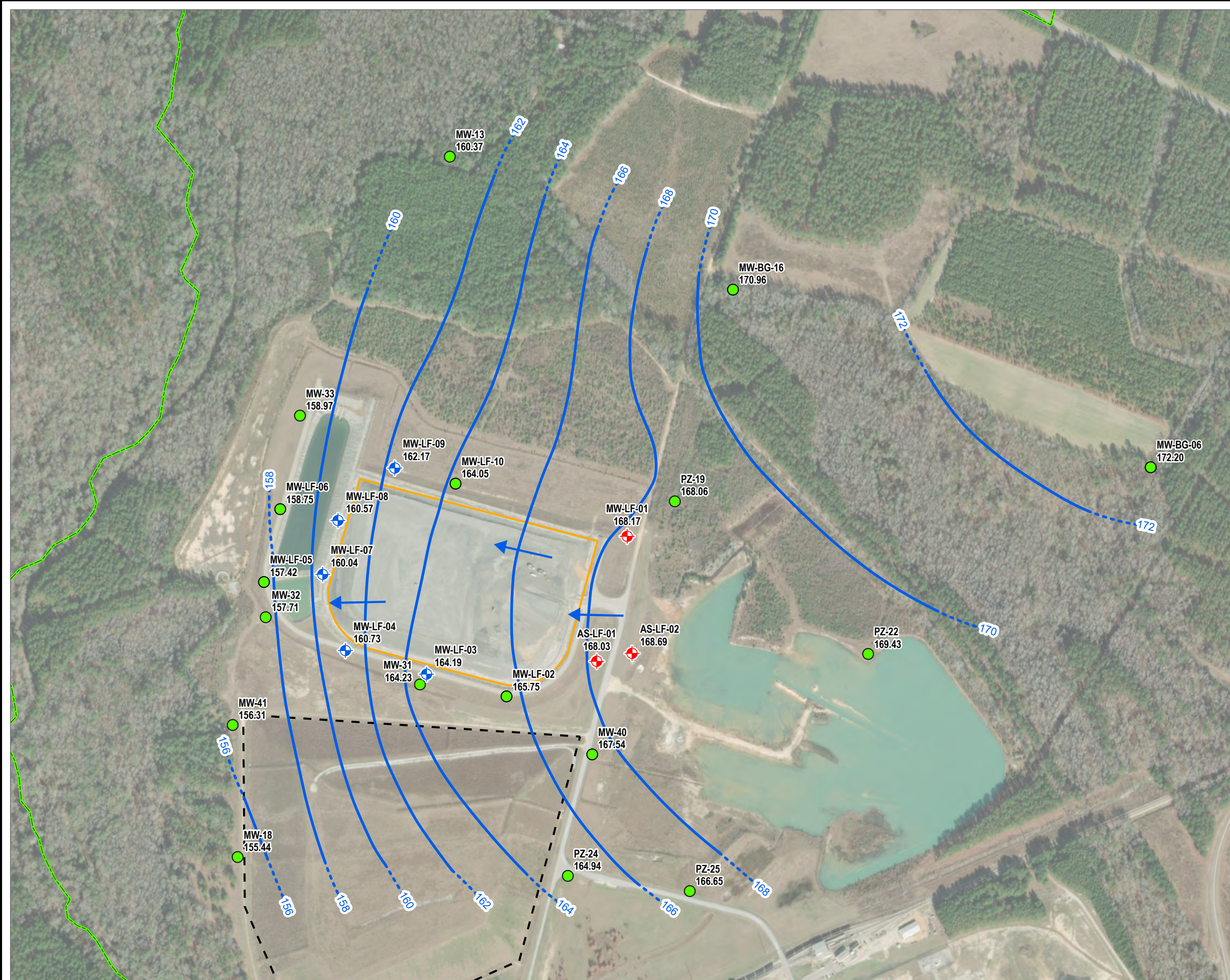
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2. NM = NOT MEASURED.



1:6,000
 1" = 500'
 0 250 500 FEET

PROJECT: DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE: GROUNDWATER POTENTIOMETRIC MAP MARCH 7, 2023	
DRAWN BY: H. BEST	PROJ. NO.: 416559.0007.0000
CHECKED BY: A. KAILAS	FIGURE 4
APPROVED BY: J. YONTS	
DATE: JANUARY 2024	
50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
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LEGEND

- ◆ CCR BACKGROUND MONITORING WELL
- ◆ CCR DOWNGRAIDENT MONITORING WELL
- EVENT PIEZOMETER
- CLASS III LANDFILL
- CLOSED CLASS II LANDFILL
- PROPERTY BOUNDARY
- WATER TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL (2' CONTOUR INTERVALS) - DASHED WHERE INFERRED
- APPROXIMATE GROUNDWATER FLOW DIRECTION

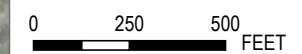
160.77 WATER ELEVATION (FT. MSL)

NOTES:

1. AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.



1:6,000
 1" = 500'



PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE:		GROUNDWATER POTENTIOMETRIC MAP OCTOBER 2, 2023	
DRAWN BY:	L. LILL	PROJ. NO.:	416559.0007.0000
CHECKED BY:	J. YONTS	FIGURE 5	
APPROVED BY:	R. MAYER		
DATE:	JANUARY 2024		
TRC		50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
FILE:	2023_Figures.aprx		

Appendix A

August 2022 Alternate Source Demonstration



DOMINION ENERGY SOUTH CAROLINA

COPE STATION CLASS III LANDFILL

ORANGEBURG COUNTY, SOUTH CAROLINA

EPA CCR RULE COMPLIANCE

ALTERNATE SOURCE DEMONSTRATION REPORT

Second Semiannual 2022 Detection Monitoring Event

March 10, 2023



A handwritten signature in blue ink, reading "Nakia W. Addison".

Nakia W. Addison, P.E.
Senior Engineer

A handwritten signature in blue ink, reading "Richard A. Mayer Jr.".

Richard A. Mayer Jr., P.G.
Project Hydrogeologist

Table of Contents

Executive Summary.....	ii
1. Introduction.....	1-1
1.1 Background	1-1
1.2 Groundwater Monitoring and Statistical Analysis	1-1
1.3 Purpose	1-2
1.4 Site Hydrogeology	1-3
1.5 General Groundwater Quality.....	1-3
2. Alternate Source Demonstration	2-1
2.1 Chloride at MW-LF-02	2-1
3. Conclusions.....	3-1
4. Certification	4-1
5. References	5-1

List of Figures

Figure 1	Site Location Map
Figure 2	CCR Rule Compliance Monitoring Well Network
Figure 3	Groundwater Potentiometric Surface Map - August 2022
Figure 4	Chloride Isoconcentration Map - August 2022
Figure 5	Piper Diagram - August 2022

List of Tables

Table 1	Summary of Second Semiannual 2022 Detection Monitoring Program Sampling Event Data
Table 2	Summary of Alternate Source Demonstration Parameters – August 2022

Executive Summary

Dominion Energy South Carolina (DESC) completed the most recent semiannual detection monitoring sampling (second semiannual 2022 sampling event) in August 2022 for the Cope Generating Station (Station) Class III Industrial Landfill (Unit) pursuant to the *Criteria for Classification of Solid Waste Disposal Facilities and Practices; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, 40 CFR Part 257 (CCR Rule). The Unit constitutes a coal combustion residuals (CCR) Unit per the CCR Rule. Per 40 CFR §257.94, the samples were analyzed for the Appendix III detection monitoring parameters. Upon receipt of the laboratory analytical results, statistical analysis was performed and evaluated for potential statistically significant increases (SSI) above background concentrations.

The following SSI above background concentrations was identified based on direct comparisons made between the statistically derived background threshold value (95 percent upper prediction limit) and the downgradient monitoring results:

- Chloride (MW-LF-02).

The information provided in this report serves as DESC's alternate source demonstration (ASD) prepared in accordance with 40 CFR §257.94(e)(2) and successfully demonstrates that the SSI is not due to a release from the Unit to groundwater, but is due to the following:

- A potential source located upgradient from the Unit and/or
- Natural variation in groundwater quality within the area

Therefore, based on the information provided in this ASD report, DESC will continue to conduct semiannual detection monitoring for Appendix III constituents in accordance with 40 CFR §257.94 at the certified groundwater monitoring well system (Certified Monitoring Well Network) for the CCR Unit.

Section 1

Introduction

1.1 Background

Dominion Energy South Carolina, Inc. (DESC) operates the Cope Generating Station (Station), a coal-fired power plant, to generate electricity. The Station is located at 405 Teamwork Drive in Cope, Orangeburg County, South Carolina as shown on **Figure 1**. The Station began operations in 1996 and operates a single 417-megawatt coal-fired unit. Coal combustion residuals (CCR) are produced as part of the electrical generation operations. The Station consists of Class II and III landfills and a landfill leachate pond. The Class III Landfill (Unit) is currently regulated under the CCR rule, the Class II Landfill is closed, and the Landfill Leachate Pond is monitored and permitted under a National Pollutant Discharge System (NPDES) issued by South Carolina Department of Health and Environmental Control (SCDHEC). Phase 1 of the Unit was placed into operation in accordance with an operation approval issued by SCDHEC on November 12, 2014. The Unit is a Class 3 non-commercial industrial landfill and operates under SCDHEC Solid Waste Permit No. LF-3-00038.

The Unit receives both fly ash and flue gas desulfurization (FGD) waste from the Station and includes a liner system consisting of a minimum 2-foot-thick compacted clay layer (maximum permeability of 1×10^{-7} cm/sec) overlain by a 60-mil HDPE geomembrane and leachate collection system.

The Unit accepts CCR for disposal in accordance with the federal *Criteria for Classification of Solid Waste Disposal Facilities and Practices; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule* (CCR Rule), effective October 19, 2015, and subsequent Final Rules promulgated by the United States Environmental Protection Agency (USEPA).

1.2 Groundwater Monitoring and Statistical Analysis

In accordance with 40 CFR §257.90 through §257.94, DESC installed a groundwater monitoring system for the Unit, collected samples from the Certified Monitoring Well Network for laboratory analysis for CCR constituents, and performed statistical analysis of the collected samples. The location of the EPA CCR Rule Compliance Monitoring Well Network is presented on **Figure 2**. The Certified Monitoring Well Network consists of 10 wells installed into the subsurface to monitor shallow groundwater as follows:

- Five wells were installed as background monitoring wells and include MW-LF-01, MW-BG-06, MW-BG-16, AS-LF-01, and AS-LF-02.
- Five wells were installed as compliance monitoring wells and include MW-LF-02, MW-LF-03, MW-LF-04, MW-LF-05, and MW-LF-06.

- Additionally, monitoring well MW-40 was installed to support alternate source demonstration activities.

Pursuant to 40 CFR §257.91(f), DESC obtained certification by a qualified South Carolina-registered professional engineer (P.E.) stating that the Certified Monitoring Well Network has been designed and constructed to meet the requirements of 40 CFR §257.91 of the CCR Rule (Garrett & Moore 2017).

As discussed above, the Unit is currently being monitored pursuant to the CCR Rule. A groundwater sampling and analysis plan including selection of statistical procedures to evaluate groundwater data was prepared per the CCR Rule (Nautilus 2016). Eight quarterly background CCR Rule detection monitoring events were performed from May 2016 through July 2017 in accordance with 40 CFR §257.93(d) and §257.94(b). The eight quarterly detection monitoring background samples were analyzed for Appendix III to Part 257 – Constituents for Detection Monitoring and for Appendix IV to Part 257 – Constituents for Assessment Monitoring.

Following completion of quarterly background detection monitoring in July 2017, DESC implemented semiannual detection monitoring per 40 CFR §257.94(b) for the CCR Unit. The second semiannual (initial) detection monitoring event was performed in September 2017. Subsequent detection monitoring events, with associated verification sampling when appropriate, have been performed on a semiannual basis since September 2017. DESC completed the second semiannual 2022 detection monitoring event in August 2022. Per the CCR Rule, the semiannual detection monitoring event samples were analyzed for Appendix III constituents.

After completion of each semiannual detection monitoring event, the Appendix III data were statistically evaluated to identify potential statistically significant increases (SSIs) for Appendix III constituents above background levels. In accordance with 40 CFR §257.93(f)(6), DESC obtained certification by a qualified South Carolina-registered P.E. stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR Unit (SCE&G 2017).

Pursuant to 40 CFR §257.93(h), statistical analysis of the laboratory analytical data was performed to identify potential SSIs for the second semiannual 2022 detection monitoring event. Data from the second semiannual 2022 detection monitoring event is presented in **Table 1**. One SSI was identified for chloride at MW-LF-02.

1.3 Purpose

Pursuant to 40 CFR §257.94(e)(2), DESC may demonstrate that a source other than the CCR Unit caused the SSI identified or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The purpose of this report is to provide written

documentation of the successful alternate source demonstration (ASD) for the SSI identified for the second semiannual 2022 detection monitoring event, pursuant to 40 CFR §257.94(e)(2) of the CCR Rule.

1.4 Site Hydrogeology

The Station is located within the Edisto River Subbasin (Ace Basin watershed) of the Coastal Plain physiographic province. Aquifers and confining units in the South Carolina portion of the Coastal Plain are composed of crystalline carbonate rocks, sand, clay, silt, and gravel that contain large volumes of high-quality groundwater (SAWSC 2016). The Unit groundwater monitoring wells are within the surficial aquifer of the Huber-Congaree geologic formation. This formation consists of thinly layered, well-sorted, fine-grained sand with minimal interstitial clay and thin, laterally continuous clay interlayers (SCDNR 2009). Hydraulic conductivity values in the surficial aquifer at the Station range from 9.87×10^{-5} cm/s to 8.61×10^{-3} cm/s with an estimated groundwater flow velocities of between 0.002 to 0.84 feet/day (Nautilus 2021a).

1.5 General Groundwater Quality

Regionally, groundwater quality in the Edisto River Subbasin consists of a sodium bicarbonate water type grading to a sodium chloride water type with depth and proximity to the coast (SCDNR 2009). As such, the regional groundwater quality contains higher levels of specific constituents, such as chloride, than in other regions in South Carolina. The USEPA has established National Primary Drinking Water Regulations that define a permitted maximum contaminant level (MCL) for specific constituents in drinking water. The primary MCLs are legally enforceable standards that were established to protect public health by limiting the levels of contaminants in drinking water. Additionally, the USEPA has established non-enforceable secondary MCLs for guidelines to assist public water systems in managing their drinking water for aesthetic consideration such as taste, color, and odor. Reported water quality concentrations for select primary and/or secondary drinking water contaminants compared to USEPA MCLs are provided in the table below.

Edisto River Subbasin Groundwater Water Quality

Constituent	Concentration Range		USEPA MCL
	Low	High	
Chloride (mg/L)	1.0	1,000	250 (Secondary)

Note: mg/L = milligram per liter

As noted in the table above, the natural range of chloride within the Edisto River Subbasin, exceeds the secondary drinking water MCL established by the USEPA for drinking water (SCDNR 2009).

Section 2

Alternate Source Demonstration

Pursuant to 40 CFR §257.94(e)(2), DESC may demonstrate that a source other than the CCR Unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. As discussed previously, the second semiannual 2022 detection monitoring event was performed in August 2022. Statistical analysis of the second semiannual 2022 detection monitoring data was performed pursuant to 40 CFR §257.93(f) and (g) and in accordance with the Statistical Methods Certification (SCE&G 2017) and the Statistical Analysis Plan (OBG 2017). Based on either increasing trends at 95% confidence levels using Thiel-Sen's trend test and/or interwell prediction limits statistical analyses, the following SSI was identified:

- Chloride (MW-LF-02).

All other Appendix III constituent concentrations were within their trends at 95% confidence levels using Thiel-Sen's trend and/or interwell prediction limits in all the CCR Rule groundwater monitoring system wells.

A discussion for the SSI and associated evidence demonstrating that the SSI was not caused by a release from the Unit is provided in the subsections below.

2.1 Chloride at MW-LF-02

The chloride SSI identified at MW-LF-02 is a result of natural variation in groundwater quality from areas upgradient from the Unit. The following evidence supports this determination:

- Chloride was detected in MW-LF-02 at a concentration of 30.1 mg/L in the August 2022 sample. This concentration exceeds the background threshold value of 21.9 mg/L. Based on review of potentiometric surface mapping (**Figure 3**), shallow groundwater flow in the Unit is generally to the west-southwest, with local flow to MW-LF-02 to the north-northwest. The location of MW-LF-02 is hydraulically cross-gradient of the southeastern corner of the Unit, consistent with historical delineation of groundwater flow made at the site. Dissolved solutes in groundwater travel by advection and dispersion. In advection, the movement of dissolved solutes in groundwater is dominated by changes in hydraulic head while movement through dispersion is due to changes in solute concentrations. Given the location of MW-LF-02, advection is unlikely to have carried chloride or other solutes from the Unit. Although dispersion of chloride from the Unit remains a possibility, given the distribution of groundwater flow in the MW-LF-02 area, it is more likely that the source of chloride is from upgradient areas of the Unit such as AS-LF-01, AS-LF-02, and MW-40.
- To further evaluate the potential source of chloride in the Unit area, an isoconcentration map was prepared for the August 2022 data and presented as **Figure 4**. Monitoring wells AS-LF-01, AS-LF-02,

MW-40, and MW-BG-06 are all located upgradient from MW-LF-02 with chloride concentrations ranging from 2.62 mg/L (AS-LF-01) to 45.9 mg/L (MW-40) based on the August 2022 data. The chloride concentration at MW-LF-02 from August 2022 (30.1 mg/L) falls within this range. Historically, the highest chloride concentrations have been detected at MW-40 with a range of between 45.8 mg/L (December 2017) to 140 mg/L (September 2018) (Nautilus 2021a). The distribution of chloride in groundwater depicted by the isoconcentration map suggests that the source for chloride at MW-LF-02 is to the south-southeast of the monitoring well and the Unit.

- There are several constituents which are good indicators of coal ash impacts with lithium being one of them. Previous analysis of leachate from the Unit have indicated detections of lithium between 3,350 micrograms per liter ($\mu\text{g/L}$) and 6,254 $\mu\text{g/L}$ (Nautilus 2021a). Total lithium was analyzed during the August 2022 event and was not detected above the laboratory method detection limit (MDL) of 2.00 $\mu\text{g/L}$ at all locations sampled. Historically, lithium has not been detected above the laboratory MDL within the Unit monitoring well network with the exception of MW-LF-03 (2.4 $\mu\text{g/L}$ in March 2019 and 2.02 $\mu\text{g/L}$ in March 2021) and AS-LF-01 (2.41 $\mu\text{g/L}$ in February 2018) (Nautilus 2021b). The general absence of lithium within the Unit monitoring well network suggests that a release of leachate from the Unit has not occurred.
- Most natural waters contain cations and anions found in equilibrium (Piper 1944). Evaluation of the geochemistry of groundwater can assist in understanding the source(s) of the dissolved constituents. A geochemical analysis of major cations (calcium, magnesium, sodium, and potassium) and anions (total alkalinity, chloride, fluoride, and sulfate) was conducted during the August 2022 sampling event and presented in **Table 2**. A useful tool to graph the major distribution of the dissolved constituents in groundwater is through the use of a Piper diagram (Piper 1944). A Piper diagram was prepared using the August 2022 geochemical data and presented as **Figure 5**. The following observations were noted:
 - With respect to anions (bottom right triangle of Piper diagram), MW-LF-02 plotted closely (within the 80 to 100% chloride distribution) with background wells MW-LF-01 and MW-BG-06, along with downgradient wells MW-LF-05 and MW-LF-06.
 - With respect to cations (bottom left triangle of Piper diagram), MW-LF-02 plotted closely (within the 30 to 50% sodium + potassium distribution) with background well AS-LF-02, MW-BG-16, MW-LF-01 and downgradient well MW-LF-03, MW-LF-04, MW-LF-05, MW-LF-06.
 - With respect to the overall hydrochemical distribution (diamond in Piper diagram), MW-LF-02 plotted within the same area of the diamond as background wells AS-LF-02, MW-BG-16, and MW-LF-01 and downgradient wells MW-LF-04, MW-LF-05, and MW-LF-06 within the calcium chloride and sodium chloride mixed type water hydrochemical facies.

Evaluation of the geochemical distribution of cations and anions in the groundwater samples suggests that the water type for MW-LF-02 has similarities to that of background wells MW-LF-01, MW-BG-06, and AS-LF-02. This observation suggests that the source for chloride at MW-LF-02 is

not from the Unit. The similar geochemical signature of MW-LF-02 with background wells MW-LF-01 and MW-BG-06 further suggests that the SSI for chloride is the result of natural variations of chloride in the groundwater at the site.

Section 3

Conclusions

The information provided in this report serves as the ASD prepared in accordance with 40 CFR §257.94(e)(2) of the CCR Rule and demonstrates that the SSI determined based on statistical analysis of the second semiannual 2022 detection monitoring event performed in August of 2022 were not due to a release from the Unit to the subsurface.

Based on the information provided in this ASD report, DESC will continue to conduct semiannual detection monitoring in accordance with 40 CFR §257.94 at the Certified Monitoring Well Network for the Unit.

Section 4 Certification

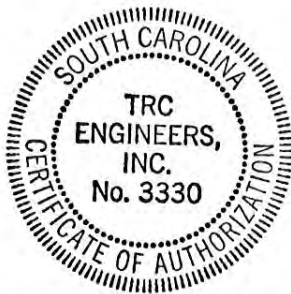
I hereby certify that the alternative source demonstration presented within this document for the DESC Cope Generating Station Coal Ash Disposal Landfill CCR Unit has been prepared to meet the requirements of Title 40 CFR §257.94(e)2 of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e) 2.

Name: Nakia W. Addison, P.E.

Expiration Date: June 30, 2024

Company: TRC Engineers, Inc.

Date: March 10, 2023



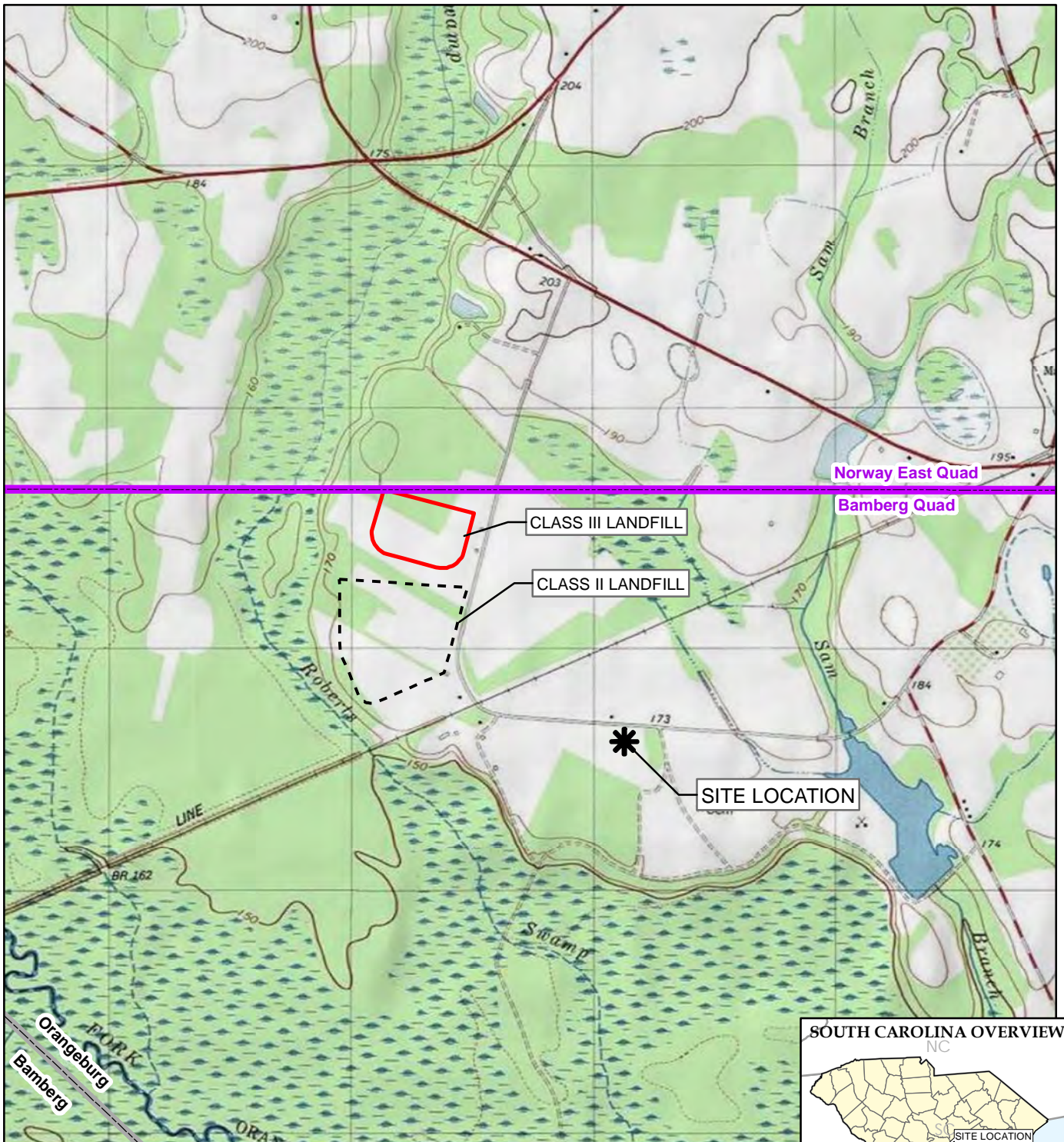
(SEAL)

Section 5

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Figures







BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES (BAMBERG & NORWAY EAST).



* SITE LOCATION

1" = 2,000'
0 1,000 2,000
1:24,000 FEET

-  USGS 24k QUAD BOUNDARY
-  COUNTY BOUNDARY
-  CLASS II LANDFILL BOUNDARY
-  CLASS III LANDFILL BOUNDARY



50 International Drive, Suite 150
Patewood Plaza Three
Greenville, SC 29615
Phone: 864.281.0030






**DOMINION ENERGY SOUTH CAROLINA
COPE STATION
405 TEAMWORK ROAD
COPE, SOUTH CAROLINA 29038**

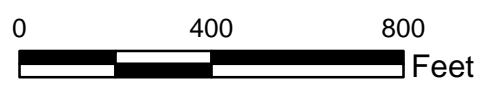
**FIGURE 1
SITE LOCATION MAP**

DRAWN BY:	J. YONTS
APPROVED BY:	R. MAYER
PROJECT NO:	416559.0007.0000
FILE NO:	Figure1_Cope_Loc_Map_CCR.mxd
DATE:	DECEMBER 2022

Plot Date: 12/22/2022 09:16:12 AM by JYONTS --LAYOUT:ANSI(B(11"x17"))
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 Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet (Foot US)
 Map Rotation: 0
 TRC - GIS




- LEGEND**
-  CCR Background Monitoring Well
 -  CCR Downgradient Monitoring Well
 -  CCR Background ASD Monitoring Well
 -  Class III Landfill Boundary
 -  Class II Landfill

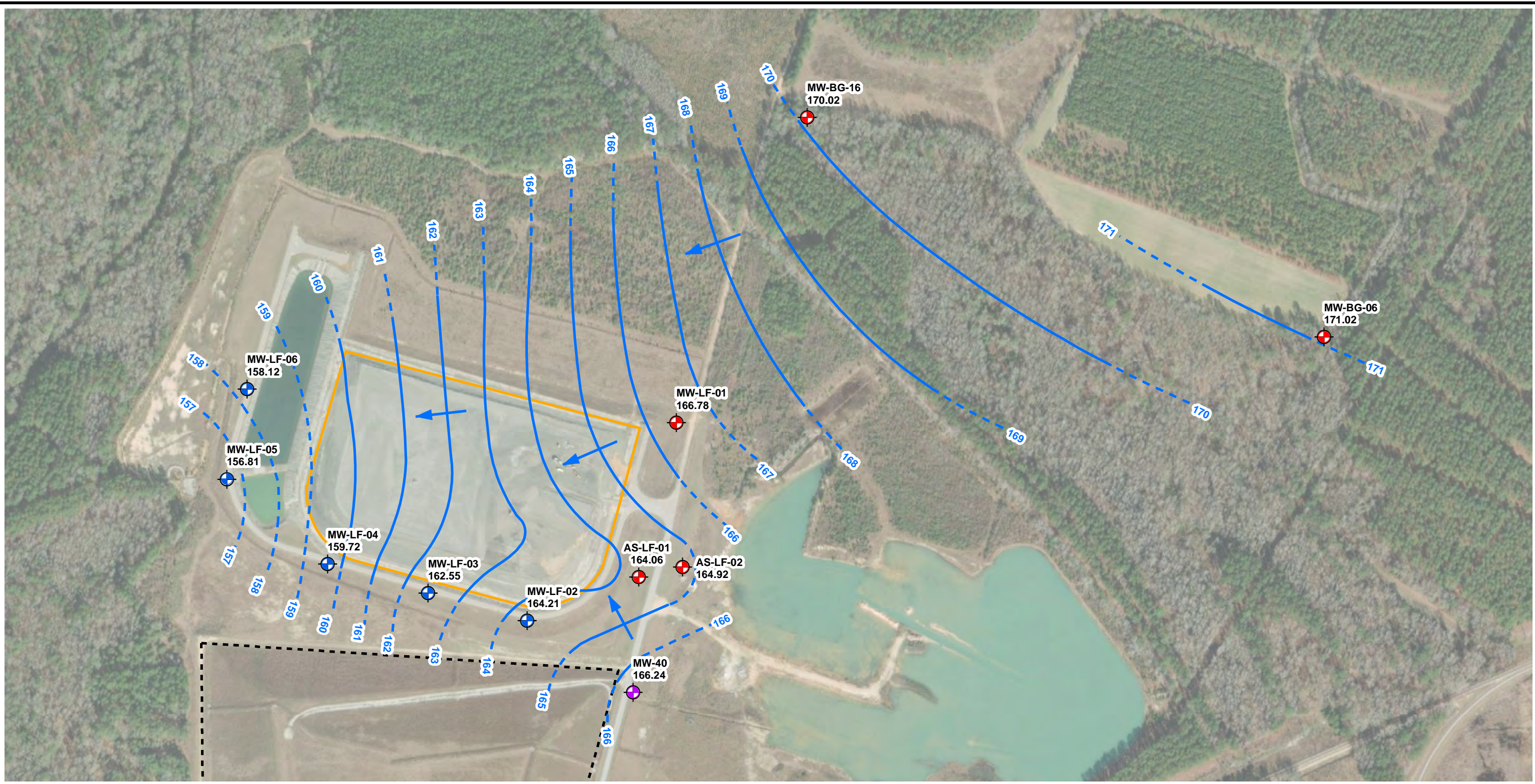


1" = 400'
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NOTE: Aerial Image from ESRI World Imagery dated January 2020.

PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA
TITLE:		CCR RULE COMPLIANCE MONITORING WELL NETWORK
DRAWN BY:	J. YONTS	PROJ. NO.: 416559.0007.0000
CHECKED BY:	R. MAYER	FIGURE 2
APPROVED BY:	R. MAYER	
DATE:	DECEMBER 2022	
		50 International Drive, Suite 150 Patwood Plaza Three Greenville, SC 29615 Phone: 864.281.0030 www.TRCCompanies.com
FILE NO.:		Figure2_Cope_CCR_Network.mxd

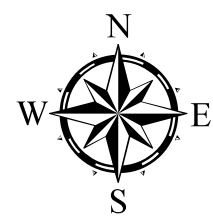
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 Path: S:\1-PROJECTS\TSDominion\South Carolina\7_Cope_Sc2022\Figure3_Cope_Class_III_CCR_202203.mxd




LEGEND

-  CCR Background Monitoring Well
-  CCR Downgradient Monitoring Well
-  CCR Background ASD Monitoring Well
-  Class III Landfill Boundary
-  Class II Landfill
-  Water Table Elevation in feet above mean sea level (1' Contour Intervals) - Dashed where inferred.
-  Approximate Groundwater Flow Direction
- 166.24** Water Elevation (FT MSL)

NOTE: Aerial Image from ESRI World Imagery dated January 2020.









PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE:		GROUNDWATER POTENTIOMETRIC SURFACE MAP - AUGUST 24, 2022	
DRAWN BY:	J. YONTS	PROJ. NO.:	416559.0007.0000
CHECKED BY:	J. BRADLEY	FIGURE 3	
APPROVED BY:	R. MAYER		
DATE:	FEBRUARY 2023	 <div style="font-size: x-small; margin-top: 5px;"> 50 International Drive, Suite 150 Patwood Plaza Three Greenville, SC 29615 Phone: 864.281.0030 www.TRCCompanies.com </div>	
FILE NO.:			

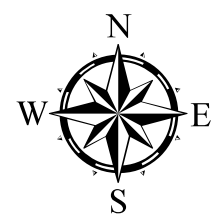
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 Path: S:\1-PROJECTS\Dominion\South Carolina\7_Cope_SC2022\Figure4_Cope_Class_III_Chloride_202203.mxd



LEGEND

-  CCR Background Monitoring Well
-  CCR Downgradient Monitoring Well
-  CCR Background ASD Monitoring Well
-  Class III Landfill Boundary
-  Class II Landfill

 Chloride Concentrations in mg/L
 (10 mg/L Intervals) - Dashed where inferred
 Background threshold is 21.9 mg/L

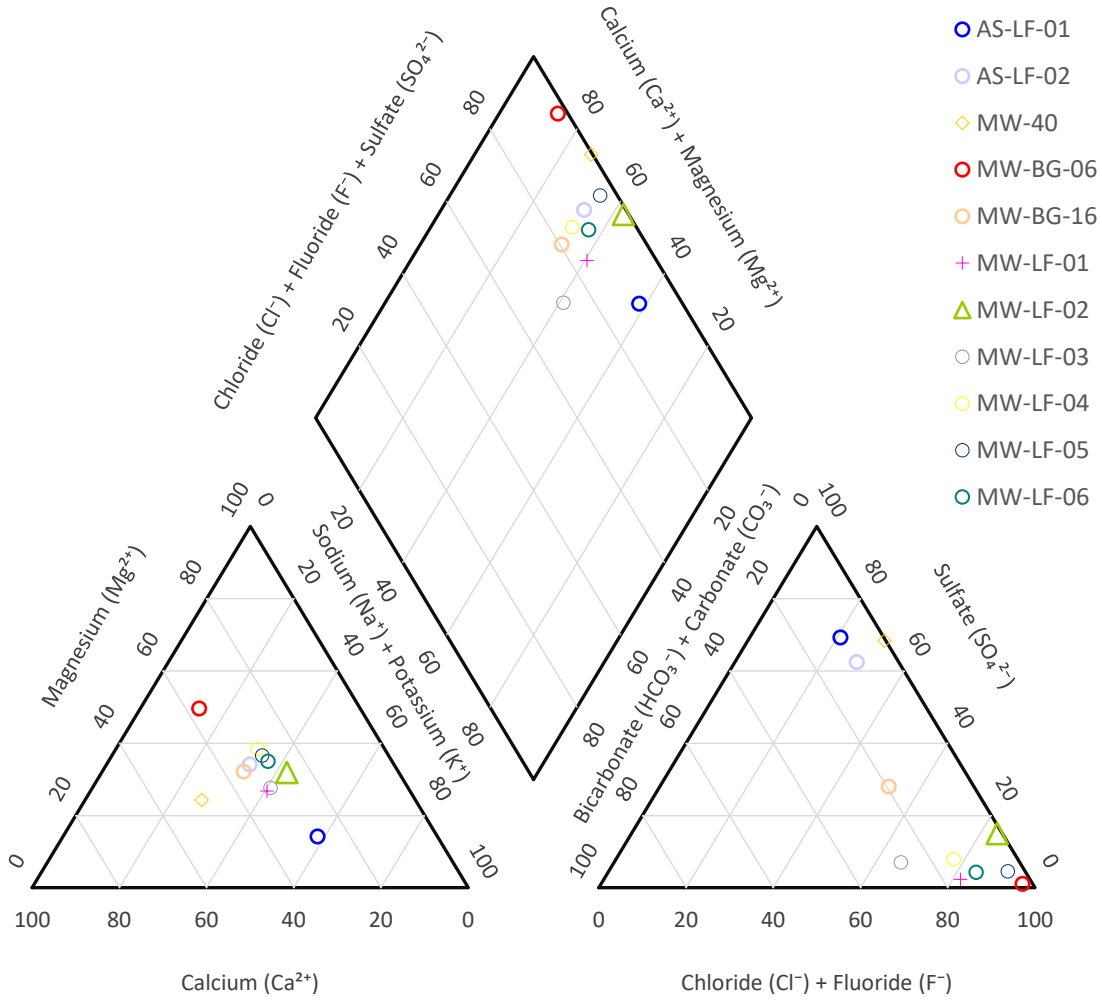


1" = 400'
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NOTE: Aerial Image from ESRI World Imagery dated January 2020.

PROJECT: DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE: CHLORIDE ISOCONCENTRATION MAP AUGUST 29 & 30, 2022	
DRAWN BY:	J. YONTS
PROJ. NO.:	416559.0007.0000
CHECKED BY:	D. SZYNAL
APPROVED BY:	R. MAYER
DATE:	FEBRUARY 2023
FIGURE 4	
50 International Drive, Suite 150 Palmetto Plaza Three Greenville, SC 29615 Phone: 864.281.0030 www.TRCCompanies.com	
FILE NO.:	Figure4_Cope_Class_III_Chloride_202203.mxd

FIGURE 5
DESC Cope Station
Class III Landfill
Piper Diagram - August 2022



Tables

Table 1
Summary of Second Semiannual 2022 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	Background Wells																				ASD Support Well			
			MW-LF-01				MW-BG-06				MW-BG-16				AS-LF-01				AS-LF-02				MW-40			
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL
Sample ID:																										
Sample Date:																										
CCR Appendix III																										
Boron	µg/L	1000	11.2	J	4.00	15.0	7.70	J	4.00	15.0	9.26	J	4.00	15.0	19.5		4.00	15.0	31.7		4.00	15.0	48.6		4.00	15.0
Calcium	mg/L	15.8	2.040		0.030	0.100	9.630		0.030	0.030	1.890		0.030	0.030	1.810		0.030	0.030	3.620		0.030	0.030	30.100		0.030	0.030
Chloride	mg/L	21.9	9.52		0.0670	0.200	18.0		0.335	1.00	3.09		0.0670	0.200	2.62		0.0670	0.200	5.34		0.0670	0.200	45.9		0.067	0.200
Fluoride	mg/L	0.165	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0375	J	0.0330	0.100	0.589		0.0330	0.100
pH	SU	3.4 - 6.2	4.43		0.01	0.01	4.23		0.01	0.01	4.66		0.01	0.01	4.30		0.01	0.01	4.41		0.01	0.01	4.01		0.01	0.01
Sulfate	mg/L	21.6	0.371	J	0.133	0.400	0.284	J	0.133	0.400	2.26		0.133	0.400	12.0		0.133	0.400	16.4		0.133	0.400	139		1.33	4.00
Total Dissolved Solids	mg/L	295.3	2.38	U	2.38	10.0	87.0		2.38	10.0	10.0		2.38	10.0	9.00	J	2.38	10.0	36.0		2.38	10.0	263		2.38	10.0
Field Parameters																										
Conductivity	µS/cm	--	52.90		0.1	0.1	183.56		0.1	0.1	41.46		0.1	0.1	57.68		0.1	0.1	82.10		0.1	0.1	480.97		0.1	0.1
Dissolved Oxygen	mg/L	--	2.25		0.01	0.01	6.26		0.01	0.01	6.91		0.01	0.01	4.06		0.01	0.01	3.29		0.01	0.01	0.17		0.01	0.01
Temperature	C	--	25.40		0.01	0.01	21.18		0.01	0.01	21.48		0.01	0.01	25.51		0.01	0.01	25.29		0.01	0.01	24.44		0.01	0.01
Turbidity	NTU	--	2.17		0.1	0.1	1.95		0.1	0.1	2.05		0.1	0.1	1.58		0.1	0.1	2.06		0.1	0.1	1.84		0.1	0.1
Depth to Water	ft btoc	--	9.63		0.01	0.01	16.93		0.01	0.01	12.50		0.01	0.01	10.69		0.01	0.01	10.46		0.01	0.01	11.04		0.01	0.01
Groundwater Elevation	ft msl	--	166.78		0.01	0.01	171.02		0.01	0.01	170.02		0.01	0.01	164.06		0.01	0.01	164.92		0.01	0.01	166.24		0.01	0.01
Oxidation Reduction Potential	millivolts	--	70.1		0.1	0.1	80.1		0.1	0.1	91.3		0.1	0.1	73.4		0.1	0.1	91.9		0.1	0.1	111.7		0.1	0.1

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit
ft btoc = feet below top of casing
ft msl = feet above mean sea level

Qualifiers (Qual)
J = Estimated Results
U = Samples reported below their respective MDL
 = Concentration greater than Background Threshold Values
Bold font = Detected constituent
* - Groundwater Elevation data collected on August 24, 2022

Table 1
Summary of Second Semiannual 2022 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	Downgradient Wells																								
			MW-LF-02				MW-LF-03				MW-LF-04				MW-LF-05				MW-LF-06				MW-LF-06-DUP				
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	
Sample ID:																											
Sample Date:																											
CCR Appendix III																											
Boron	µg/L	1000	16.4		4.00	15.0	7.62	J	4.00	15.0	9.88	J	4.00	15.0	10.2	J	4.00	15.0	10.6	J	4.00	15.0	10.4	J	4.00	15.0	
Calcium	mg/L	15.8	4.870		0.030	0.100	1.220		0.030	0.100	1.730		0.030	0.100	2.680		0.030	0.030	2.410		0.030	0.030	2.290		0.030	0.030	
Chloride	mg/L	21.9	30.1		0.335	1.00	3.34		0.0670	0.200	4.87		0.0670	0.200	9.74		0.0670	0.200	8.62		0.0670	0.200	8.58		0.0670	0.200	
Fluoride	mg/L	0.165	0.124		0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	
pH	SU	3.4 - 6.2	3.88		0.01	0.01	4.03		0.01	0.01	4.13		0.01	0.01	4.01		0.01	0.01	4.01		0.01	0.01	4.01		0.01	0.01	
Sulfate	mg/L	21.6	7.34		0.133	0.400	0.491		0.133	0.400	0.682		0.133	0.400	0.656		0.133	0.400	0.592		0.133	0.400	0.571		0.133	0.400	
Total Dissolved Solids	mg/L	295.3	55.0		2.38	10.0	2.38	U	2.38	10.0	14.0		2.38	10.0	32.0		2.38	10.0	17.0		2.38	10.0	14.0		2.38	10.0	
Field Parameters																											
Conductivity	µS/cm	--	163.77		0.1	0.1	38.19		0.1	0.1	49.89		0.1	0.1	76.91		0.1	0.1	60.75		0.1	0.1	60.75		0.1	0.1	
Dissolved Oxygen	mg/L	--	0.50		0.01	0.01	2.66		0.01	0.01	4.63		0.01	0.01	4.45		0.01	0.01	4.10		0.01	0.01	4.10		0.01	0.01	
Temperature	C	--	24.37		0.01	0.01	24.72		0.01	0.01	24.06		0.01	0.01	27.01		0.01	0.01	26.42		0.01	0.01	26.42		0.01	0.01	
Turbidity	NTU	--	0.75		0.1	0.1	0.14		0.1	0.1	2.15		0.1	0.1	0.35		0.1	0.1	0.57		0.1	0.1	0.57		0.1	0.1	
Depth to Water	ft btoc	--	25.87		0.01	0.01	24.64		0.01	0.01	24.48		0.01	0.01	21.14		0.01	0.01	20.45		0.01	0.01	20.45		0.01	0.01	
Groundwater Elevation	ft msl	--	164.21		0.01	0.01	162.55		0.01	0.01	159.72		0.01	0.01	156.81		0.01	0.01	158.12		0.01	0.01	158.12		0.01	0.01	
Oxidation Reduction Potential	millivolts	--	146.4		0.1	0.1	112.3		0.1	0.1	195.4		0.1	0.1	191.6		0.1	0.1	161.9		0.1	0.1	161.9		0.1	0.1	

Notes:

MDL = Method Detection Limit
 QL = Quantification Limit
 mg/L = Milligram per liter
 µg/L = Microgram per liter
 µS/cm = MicroSiemen per centimeter
 SU = Standard Units
 C = Degrees Celsius
 NTU = Nephelometric Turbidity Unit
 ft btoc = feet below top of casing
 ft msl = feet above mean sea level

Qualifiers (Qual)

J = Estimated Results
 U = Samples reported below their respective MDL

Background Threshold Values = Concentration greater than Background Threshold Values

Bold font = Detected constituent

* - Groundwater Elevation data collected on August 24, 2022

Table 2
Summary of Second Semiannual 2022
Alternate Source Demonstration Parameters
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Sample ID: Sample Date: Background Threshold Values	Background Wells																				ASD Support Well			
			MW-LF-01				MW-BG-06				MW-BG-16				AS-LF-01				AS-LF-02				MW-40			
			08/29/2022				08/29/2022				08/29/2022				08/30/2022				08/30/2022				08/30/2022			
Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL			
ASD Support Parameters																										
Calcium	mg/L	15.8	2.040		0.030	0.100	9.630		0.030	0.030	1.890		0.030	0.030	1.810		0.030	0.030	3.620		0.030	0.030	30.100		0.030	0.030
Chloride	mg/L	21.9	9.52		0.0670	0.200	18.0		0.335	1.00	3.09		0.0670	0.200	2.62		0.0670	0.200	5.34		0.0670	0.200	45.9		0.067	0.200
Fluoride	mg/L	0.165	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0375	J	0.0330	0.100	0.589		0.0330	0.100
Sulfate	mg/L	21.6	0.371	J	0.133	0.400	0.284	J	0.133	0.400	2.26		0.133	0.400	12.0		0.133	0.400	16.4		0.133	0.400	139		1.33	4.00
Total Dissolved Solids	mg/L	295.3	2.38	U	2.38	10.0	87.0		2.38	10.0	10.0		2.38	10.0	9.00	J	2.38	10.0	36.0		2.38	10.0	263		2.38	10.0
Alkalinity, Total as CaCO3	mg/L	--	3.20	J	1.45	4.00	1.45	U	1.45	4.00	2.00	J	1.45	4.00	2.20	J	1.45	4.00	3.20	J	1.45	4.00	1.45	U	1.45	4.00
Lithium	ug/L	--	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0
Magnesium	ug/L	--	1010		10.0	15.0	7860		10.0	15.0	1040		10.0	15.0	569		10.0	15.0	2270		10.0	15.0	9050		10.0	15.0
Potassium	ug/L	--	651		80.0	300	1760		80.0	300	1650		80.0	300	1160		80.0	300	2450		80.0	300	4570		80.0	300
Sodium	ug/L	--	2510		80.0	250	3000		80.0	250	1010		80.0	250	3740		80.0	250	2680		80.0	250	16200		80.0	250

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
-- = Not applicable.

Qualifiers (Qual)
J = Estimated Results
U = Samples reported below their respective MDL
 = Concentration greater than Background Threshold Values
Bold font = Detected constituent

Table 2
Summary of Second Semiannual 2022
Alternate Source Demonstration Parameters
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Sample ID: Sample Date:	Downgradient Wells																							
			MW-LF-02				MW-LF-03				MW-LF-04				MW-LF-05				MW-LF-06				MW-LF-06-DUP			
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL
ASD Support Parameters																										
Calcium	mg/L	15.8	4.870		0.030	0.100	1.220		0.030	0.100	1.730		0.030	0.100	2.680		0.030	0.030	2.410		0.030	0.030	2.290		0.030	0.030
Chloride	mg/L	21.9	30.1		0.335	1.00	3.34		0.0670	0.200	4.87		0.0670	0.200	9.74		0.0670	0.200	8.62		0.0670	0.200	8.58		0.0670	0.200
Fluoride	mg/L	0.165	0.124		0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100
Sulfate	mg/L	21.6	7.34		0.133	0.400	0.491		0.133	0.400	0.682		0.133	0.400	0.656		0.133	0.400	0.592		0.133	0.400	0.571		0.133	0.400
Total Dissolved Solids	mg/L	295.3	55.0		2.38	10.0	2.38	U	2.38	10.0	14.0		2.38	10.0	32.0		2.38	10.0	17.0		2.38	10.0	14.0		2.38	10.0
Alkalinity, Total as CaCO3	mg/L	--	1.45	U	1.45	4.00	2.40	J	1.45	4.00	1.60	J	1.45	4.00	1.45	U	1.45	4.00	2.00	J	1.45	4.00	2.20	J	1.45	4.00
Lithium	ug/L	--	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0	2.00	U	2.00	10.0
Magnesium	ug/L	--	3680		10.0	15.0	651		10.0	15.0	1390		10.0	15.0	2060		10.0	15.0	1600		10.0	15.0	1640		10.0	15.0
Potassium	ug/L	--	5260		80.0	300	1100		80.0	300	428		80.0	300	976		80.0	300	281	J	80.0	300	336		80.0	300
Sodium	ug/L	--	6170		80.0	250	1170		80.0	250	1970		80.0	250	3090		80.0	250	2990		80.0	250	3050		80.0	250

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
-- = Not applicable.

Qualifiers (Qual)
J = Estimated Results
U = Samples reported below their respective MDL
 = Concentration greater than Background Threshold Values
Bold font = Detected constituent

Appendix B

March 2023 Alternate Source Demonstration



DOMINION ENERGY SOUTH CAROLINA

COPE STATION CLASS III LANDFILL

ORANGEBURG COUNTY, SOUTH CAROLINA

EPA CCR RULE COMPLIANCE

ALTERNATE SOURCE DEMONSTRATION REPORT

First Semiannual 2023 Detection Monitoring Event

September 15, 2023



Handwritten signature of Nakia W. Addison in blue ink.

Nakia W. Addison, P.E.
Senior Engineer

Handwritten signature of Richard A. Mayer Jr. in blue ink.

Richard A. Mayer Jr., P.G.
Project Hydrogeologist

*TRC Environmental Corporation | Dominion Energy South Carolina
Cope Station Class III Landfill
Alternate Source Demonstration*

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Table of Contents

Executive Summary.....	ii
1. Introduction.....	1-1
1.1 Background	1-1
1.2 Groundwater Monitoring and Statistical Analysis	1-1
1.3 Purpose	1-2
1.4 Site Hydrogeology	1-2
2. Alternate Source Demonstration	2-1
2.1 Chloride at MW-LF-02.....	2-1
3. Evaluation of CCR Well Network	3-1
3.1 Evaluation of Background Monitoring Wells	3-1
3.2 Evaluation of Downgradient Monitoring Wells	3-1
4. Conclusions.....	4-1
5. Certification	5-1
6. References	6-1

List of Figures

Figure 1	Site Location Map
Figure 2	Site Layout Map
Figure 3	Groundwater Potentiometric Map - March 2023
Figure 4	Chloride Isoconcentration Map - March 2023

List of Tables

Table 1	Summary of First Semiannual 2023 Detection Monitoring Program Sampling Event Data
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Executive Summary

Dominion Energy South Carolina (DESC) completed the first semiannual 2023 detection monitoring event in March 2023 for the Cope Generating Station (Station) Class III Industrial Landfill (Unit) pursuant to the *Criteria for Classification of Solid Waste Disposal Facilities and Practices; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, 40 CFR Part 257 (CCR Rule). The Unit constitutes a coal combustion residuals (CCR) Unit per the CCR Rule. Per 40 CFR §257.94, the samples were analyzed for the Appendix III detection monitoring parameters. Upon receipt of the laboratory analytical results, statistical analysis was performed and evaluated for potential statistically significant increases (SSI) above background concentrations.

The following SSI was identified above background concentrations based on direct comparisons made between the statistically derived background threshold value (95 percent upper prediction limit) and the downgradient monitoring results:

- Chloride (MW-LF-02).

The information provided in this report serves as DESC's alternate source demonstration (ASD) prepared in accordance with 40 CFR §257.94(e)(2) and successfully demonstrates that the SSI is not due to a release from the Unit to groundwater, but is most likely due to:

- A potential source located upgradient from the Unit; and/or,
- An existing groundwater monitoring well network that may not be positioned to best represent monitoring of the groundwater quality passing the waste boundary of the Unit.

Therefore, based on the information provided in this ASD report, DESC will continue to conduct semiannual detection monitoring for Appendix III constituents in accordance with 40 CFR §257.94 at the certified groundwater monitoring well system (Certified Monitoring Well Network) for the Unit. TRC is evaluating the current Certified Monitoring Well Network to determine if it satisfies the CCR rule for horizontal and vertical placements for monitoring groundwater at the waste boundary of the Unit. This evaluation began in January 2023 and is anticipated to conclude in October 2023. The review will include the evaluation of monthly groundwater level measurements and 8 independent sampling events for background parameter evaluation of the proposed monitoring well network.

Section 1

Introduction

1.1 Background

Dominion Energy South Carolina (DESC) operates the Cope Generating Station (Station), a coal-fired power plant, to generate electricity. The Station is located at 405 Teamwork Drive in Cope, Orangeburg County, South Carolina as shown on **Figure 1**. The Station began operations in 1996 and operates a single 417-megawatt coal-fired unit. Coal combustion residuals (CCR) are produced as part of the electrical generation operations and currently placed in an on-site landfill put into operation in accordance with an approval issued by SCDHEC on November 12, 2014. The Landfill (Unit) is a Class 3 non-commercial industrial landfill and operates under SCDHEC Solid Waste Permit No. LF-3-00038. The Unit includes a liner system consisting of a minimum 2-foot-thick compacted clay layer (maximum permeability of 1×10^{-7} cm/sec) overlain by a 60-mil high-density polyethylene (HDPE) geomembrane and leachate collection system.

The Unit accepts CCR for disposal in accordance with the federal *Criteria for Classification of Solid Waste Disposal Facilities and Practices; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule* (CCR Rule), effective October 19, 2015, and subsequent Final Rules promulgated by the United States Environmental Protection Agency (USEPA).

1.2 Groundwater Monitoring and Statistical Analysis

In accordance with 40 CFR §257.90 through §257.94, DESC installed a groundwater monitoring system for the Unit, collected samples from the Certified Monitoring Well Network for laboratory analysis for CCR constituents, and performed statistical analysis of the collected samples. The location of the EPA CCR Rule Compliance Monitoring Well Network is presented on **Figure 2**. The Certified Monitoring Well Network consists of 10 wells installed into the subsurface to monitor shallow groundwater as follows:

- Three upgradient/background monitoring wells: MW-LF-01, MW-BG-06, and MW-BG-16
- Five downgradient monitoring wells: MW-LF-02, MW-LF-03, MW-LF-04, MW-LF-05, and MW-LF-06.
- Three wells to support alternate source demonstration activities: MW-40, AS-LF-01, and AS-LF-02.

The first semiannual 2023 detection monitoring event was conducted March 7 – 9, 2023. Per the CCR Rule, the semiannual detection monitoring event samples were analyzed for Appendix III constituents. Pursuant to 40 CFR §257.93(h), statistical analysis of the laboratory analytical data was performed to identify potential statistically significant increases (SSIs) above background for the first semiannual 2023 detection monitoring event. Data from the first semiannual 2023 detection monitoring event is presented in **Table 1**. An SSI was identified for chloride at MW-LF-02.

1.3 Purpose

Pursuant to 40 CFR §257.94(e)(2), DESC may demonstrate that a source other than the Unit caused the SSI identified or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The purpose of this report is to provide written documentation of the successful alternate source demonstration (ASD) for the SSI identified for the first semiannual 2023 detection monitoring event, pursuant to 40 CFR §257.94(e)(2) of the CCR Rule.

1.4 Site Hydrogeology

The Station is located within the Edisto River Subbasin (Ace Basin watershed) of the Coastal Plain physiographic province. Aquifers and confining units in the South Carolina portion of the Coastal Plain are composed of crystalline carbonate rocks, sand, clay, silt, and gravel that contain large volumes of high-quality groundwater (SAWSC 2016). The Unit groundwater monitoring wells are within the surficial aquifer of the Huber-Congaree geologic formation. This formation consists of thinly layered, well-sorted, fine-grained sand with minimal interstitial clay and thin, laterally continuous clay interlayers (SCDNR 2009). Hydraulic conductivity values in the surficial aquifer at the Station range from 9.87×10^{-5} cm/s to 8.61×10^{-3} cm/s with an estimated groundwater flow velocities of between 0.002 to 0.84 feet/day (Nautilus 2021a).

Section 2

Alternate Source Demonstration

Pursuant to 40 CFR §257.94(e)(2), DESC may demonstrate that a source other than the Unit caused the SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. As discussed previously, the first semiannual 2023 detection monitoring event was performed March 7– 9, 2023. Statistical analysis of the first semiannual 2023 detection monitoring data was performed pursuant to 40 CFR §257.93(f) and (g) and in accordance with the Statistical Methods Certification (SCE&G 2017) and the Statistical Analysis Plan (OBG 2017). Based on either increasing trends at 95% confidence levels using Thiel-Sen’s trend test and/or interwell prediction limits statistical analyses, the following SSI was identified:

- Chloride (MW-LF-02).

A discussion for the SSI and associated evidence demonstrating that the SSI was not caused by a release from the Unit is provided in the subsections below.

2.1 Chloride at MW-LF-02

The chloride SSI identified at MW-LF-02 is a result of natural variation in groundwater quality from areas upgradient from the Unit. The following evidence supports this determination:

- Chloride was detected in MW-LF-02 at a concentration of 27.7 milligrams per liter (mg/L) in the March 2023 sample. This concentration exceeds the background threshold value of 21.9 mg/L. Based on review of potentiometric surface mapping (**Figure 3**), shallow groundwater flow in the uppermost aquifer is generally to the west-southwest. The location of MW-LF-02 is hydraulically cross-gradient of the southeastern corner of the Unit, consistent with historical delineation of groundwater flow made at the site. Dissolved solutes in groundwater travel by advection and dispersion. In advection, the movement of dissolved solutes in groundwater is dominated by changes in hydraulic head while movement through dispersion is due to changes in solute concentrations. Given the location of MW-LF-02, advection is unlikely to have carried chloride or other solutes from the Unit. Although dispersion of chloride from the Unit remains a possibility, given the distribution of groundwater flow in the MW-LF-02 area, it is more likely that the source of chloride is from upgradient areas of the Unit.
- To further evaluate the potential source of chloride in the Unit area, an isoconcentration map was prepared for the March 2023 data and presented as **Figure 4**. Monitoring wells AS-LF-01, AS-LF-02, MW-40, and MW-BG-06 are all located upgradient from MW-LF-02 with chloride concentrations ranging from 3.66 mg/L (AS-LF-01) to 43.6 mg/L (MW-40) based on the March 2023 data. The chloride concentration at MW-LF-02 from March 2023 (27.7 mg/L) falls within this range.

Historically, the highest chloride concentrations have been detected at MW-40 with a range of

between 45.8 mg/L (December 2017) to 140 mg/L (September 2018) (Nautilus 2021a). The distribution of chloride in groundwater depicted by the isoconcentration map suggests that the source for chloride at MW-LF-02 is to the south-southeast of the monitoring well and the Unit.

Section 3

Evaluation of CCR Well Network

Pursuant to 40 CFR §257.91(a)(2), the groundwater monitoring network should accurately represent the quality of groundwater passing the waste boundary of the Unit and monitor all potential contaminant pathways. TRC is evaluating the current Certified Monitoring Well Network to determine if it satisfies the CCR rule for horizontal and vertical placements for monitoring groundwater at the waste boundary of the Unit. This evaluation began in January 2023 and is anticipated to conclude in October 2023.

3.1 Evaluation of Background Monitoring Wells

A low area located immediately upgradient of the Unit collects surface water forming a small, ponded area. Background wells AS-LF-01, AS-LF-02, and MW-LF-01 are located hydraulically downgradient of this ponded area and hydraulically upgradient of the Class III landfill. Background wells MW-BG-06 and MW-BG-16 however, are located hydraulically upgradient of this ponded area.

It is assumed that the ponded area is unlined and may function as a potential recharge area to the underlying aquifer. Hydraulic mounding beneath the ponded area may be present which would suggest that the ponded area could be a source of recharge to the uppermost aquifer. The location and screened intervals of background wells AS-LF-01, AS-LF-02, and MW-LF-01 are within the uppermost aquifer and seem appropriate to yield groundwater samples representative of background groundwater quality entering the Unit. Background wells MW-BG-06 and MW-BG-16 are located hydraulically upgradient from both the Unit and the ponded area. While these wells do provide background groundwater quality data from a location that would not be affected by potential leakage from the Unit, it does not consider potential contributions of constituents to groundwater from the ponded area.

3.2 Evaluation of Downgradient Monitoring Wells

According to the *Class III Landfill Run-on and Run-off Control System Plan* (TRC, 2021), the Unit has run-on controls consisting of a perimeter berm and perimeter swales. As constructed, the perimeter berm for the active Phase I of the Unit is elevated between approximately 8 to 18 feet above the surrounding area. Perimeter ditches located on the CCR side of the Unit perimeter berm discharge to an adjacent downgradient lined Wastewater Pond 1. Water from wastewater Pond 1 is pumped back to the station where it goes through a treatment system prior to being available for recirculation as a process water.

Downgradient wells MW-LF-05 and MW-LF-06 are located on the west side (downgradient side) of Wastewater Pond 1 and these wells may not accurately represent the quality of groundwater passing the waste boundary of the Unit. To evaluate this possibility, monitoring wells MW-LF-07 and MW-LF-08 were installed in January 2023, between the Unit and the Wastewater Pond, at the edge of the Unit

waste boundary. Additionally, monitoring wells MW-LF-09 and MW-LF-10 were installed along the northwestern corner of the Unit. The newly installed monitoring wells are currently gauged for water levels monthly to evaluate groundwater flow on the downgradient portion of the Unit. The location of the new monitoring wells is depicted on **Figure 2**.

The four new monitoring wells have been sampled up to 8 times (January 2023 to August 2023) for background data collection in accordance with the CCR Rule in the circumstance that these monitoring wells may be used for compliance in the groundwater monitoring network. The data is currently being evaluated by TRC however, based on preliminary review, the proposed monitoring well network may include:

- Background monitoring wells - MW-LF-01, AS-LF-01, and AS-LF-02.
 - Remove existing CCR network wells MW-BG-06 and MW-BG-16 as they do not appear to provide representative background groundwater quality per CCR Rule §257.91(a)(1)(ii).
- Downgradient monitoring wells – MW-LF-03, MW-LF-04, MW-LF-07, MW-LF-08, and MW-LF-09.
 - Remove MW-LF-02 from the existing CCR well network as this well does not appear to monitor groundwater passing beneath the Unit.
 - Replace existing CCR network wells MW-LF-05 and MW-LF-06 with new wells MW-LF-07, MW-LF-08, and MW-LF-09 that are located at the waste boundary per CCR Rule §257.91(a)(2).

The new network will be certified in accordance with the CCR Rule §257.91(f).

Section 4

Conclusions

The information provided in this report serves as the ASD prepared in accordance with 40 CFR §257.94(e)(2) of the CCR Rule and demonstrates that the chloride SSI at well MW-LF-02 was not due to a release from the Unit to the subsurface, but is most likely due to:

- A potential source located upgradient from the Unit; and/or,
- An existing groundwater monitoring well network that may not be positioned to best represent monitoring of the groundwater quality passing the waste boundary of the Unit.

TRC is evaluating the current Certified Monitoring Well Network to determine if it satisfies the CCR rule for horizontal and vertical placements for monitoring groundwater at the waste boundary of the Unit. This evaluation began in January 2023 and is anticipated to conclude in October 2023. The review will include the evaluation of monthly groundwater level measurements and 8 independent sampling events for background parameter evaluation of the proposed monitoring well network.

Section 5 Certification

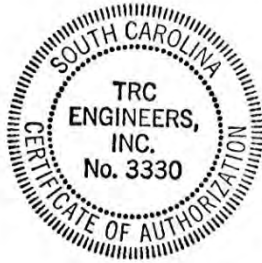
I hereby certify that the alternative source demonstration presented within this document for the DESC Cope Generating Station Coal Ash Disposal Landfill Unit has been prepared to meet the requirements of Title 40 CFR §257.94(e)(2) of the Federal CCR Rule. This document is accurate and has been prepared in accordance with good engineering practices, including the consideration of applicable industry standards, and with the requirements of Title 40 CFR §257.94(e)(2).

Name: Nakia W. Addison, P.E.

Expiration Date: June 30, 2024

Company: TRC Engineers, Inc.

Date: September 15, 2023



(SEAL)

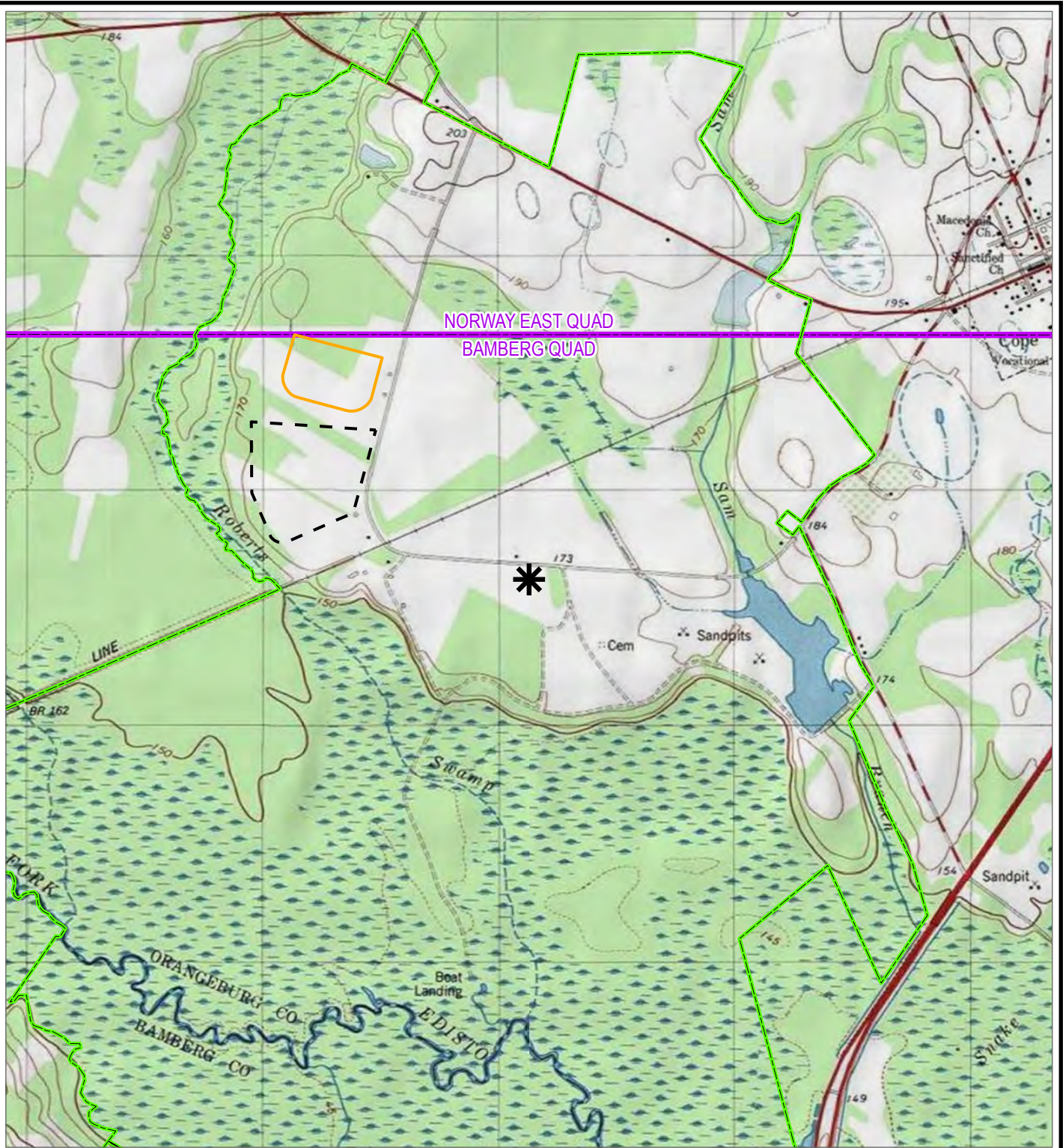
Section 6






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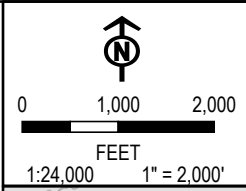
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- TRC Environmental Corporation, (TRC). 2021. Class III Landfill Run-on and Run-off Control System Plan. Cope, South Carolina. October 2021.


Figures

COORDINATE SYSTEM: NAD 1983 STATEPLANE SOUTH CAROLINA FIPS 3900 FEET, MAP ROTATION: 0
 -- SAVED BY: HBEST ON 8/25/2023, 12:34:08 PM. FILE PATH: \\EMPLOYEE\GIS\ARCGIS\PRO\PROJECTS\DOMINIONSOUTH_CAROLINA\7_COPE_SCI\2-APR\2023_FIGURES\2023_FIGURES.APRX. LAYOUT NAME: FIG 1 SLM



-  SITE LOCATION
-  CLASS III LANDFILL
-  CLASS II LANDFILL
-  PROPERTY BOUNDARY
-  7.5' USGS QUADRANGLE BOUNDARY



PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE:		SITE LOCATION MAP	
DRAWN BY:	H. BEST	PROJ. NO.:	416559.0007.0000
CHECKED BY:	A. KAILAS	FIGURE 1	
APPROVED BY:	J. YONTS		
DATE:	AUGUST 2023		
		50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
FILE:		2023_FIGURES	

BASE MAP: USGS COLOR ORTHO IMAGERY
 DATA SOURCES: TRC

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3800 Feet, Map Rotation: 0
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LEGEND

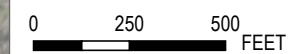
- ◆ CCR BACKGROUND MONITORING WELL
- ◆ CCR DOWNGRAIDENT MONITORING WELL
- ◆ CCR BACKGROUND ASD MONITORING WELL
- ◆ NEW MONITORING WELL INSTALLATION LOCATION
- EVENT PIEZOMETER
- CLASS III LANDFILL
- CLASS II LANDFILL
- CLASS III LANDFILL POND
- PROPERTY BOUNDARY

NOTES:

1. AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.



1:6,000
 1" = 500'



PROJECT: DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE: SITE LAYOUT MAP	
DRAWN BY: H. BEST	PROJ. NO.: 416559.0007.0000
CHECKED BY: A. KAILAS	FIGURE 2
APPROVED BY: J. YONTS	
DATE: AUGUST 2023	
50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
FILE: 2023_Figures.aprx	

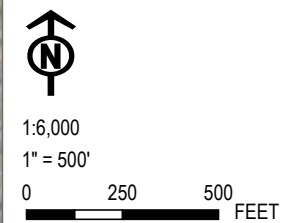
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- LEGEND**
- CCR BACKGROUND MONITORING WELL
 - CCR DOWNGRADIENT MONITORING WELL
 - CCR BACKGROUND ASD MONITORING WELL
 - NEW MONITORING WELL INSTALLATION LOCATION
 - EVENT PIEZOMETER
 - APPROXIMATE GROUNDWATER FLOW DIRECTION
 - CLASS II LANDFILL
 - CLASS III LANDFILL
 - PROPERTY BOUNDARY
 - WATER TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL (2' CONTOUR INTERVALS) - DASHED WHERE INFERRED
- 169.34 WATER ELEVATION (FT. MSL)**

NOTES:

- AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.



PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE: GROUNDWATER POTENTIOMETRIC MAP MARCH 7, 2023			
DRAWN BY:	H. BEST	PROJ. NO.:	416559.0007.0000
CHECKED BY:	A. KAILAS	FIGURE 3	
APPROVED BY:	J. YONTS		
DATE:	AUGUST 2023		
		50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
FILE:	2023_Figures.aprx		

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3900 Feet; Map Rotation: 0
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LEGEND

- ◆ CCR BACKGROUND MONITORING WELL
- ◆ CCR DOWNGRAIENT MONITORING WELL
- ◆ CCR BACKGROUND ASD MONITORING WELL

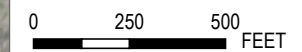
- CLASS III LANDFILL
- CLASS II LANDFILL
- CLASS III LANDFILL POND
- PROPERTY BOUNDARY
- CHLORIDE ISOCONCENTRATION CONTOUR -
 DASHED WHERE INFERRED
 8.05 - CHLORIDE CONCENTRATION (mg/L)

NOTES:

1. AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.



1:6,000
 1" = 500'



PROJECT: DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE: CHLORIDE ISOCONCENTRATION MAP MARCH 7, 2023	
DRAWN BY: H. BEST	PROJ. NO.: 416559.0007.0000
CHECKED BY: A. KAILAS	FIGURE 4
APPROVED BY: J. YONTS	
DATE: AUGUST 2023	
50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
FILE:	2023_Figures.aprx

Tables

Table 1
Summary of First Semiannual 2023 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	Background Wells																				ASD Support Well				
			MW-LF-01				MW-BG-06				MW-BG-16				AS-LF-01				AS-LF-02				MW-40				
			03/07/2023				03/07/2023				03/08/2023				03/09/2023				03/09/2023				03/08/2023				
			Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	
CCR Appendix III																											
Boron	µg/L	200	9.44	J	4.00	15.0	8.89	J	4.00	15.0	8.72	J	4.00	15.0	9.13	J	4.00	15.0	12.2	J	4.00	15.0	41.8		4.00	15.0	
Calcium	µg/L	15,800	2,320	J+	30.0	100	9,510	J+	30.0	100	2,480	J+	30.0	100	3,570		30.0	100	3,280		30.0	100	37,000	J+	30.0	100	
Chloride	mg/L	21.9	7.97		0.0670	0.200	17.8		0.335	1.00	5.20		0.0670	0.200	3.66		0.0670	0.200	8.05		0.0670	0.200	43.6		1.34	4.00	
Fluoride	mg/L	0.225	0.0575	J	0.0330	0.100	0.0806	J	0.0330	0.100	0.0330	U	0.0330	0.100	0.0992	J	0.0330	0.100	0.0815	J	0.0330	0.100	0.886	J	0.0330	0.100	
pH	SU	3.4 - 5.8	4.55		0.01	0.01	4.34		0.01	0.01	4.61		0.01	0.01	4.57		0.01	0.01	4.46		0.01	0.01	4.04		0.01	0.01	
Sulfate	mg/L	21.6	0.196	J	0.133	0.400	0.239	J	0.133	0.400	1.87		0.133	0.400	15.0		0.133	0.400	10.3		0.133	0.400	169		2.66	8.00	
Total Dissolved Solids	mg/L	141.3	2.38	U	2.38	10.0	65.0		2.38	10.0	20.0		2.38	10.0	11.0		2.38	10.0	12.0		2.38	10.0	287		2.38	10.0	
Field Parameters																											
Conductivity	µS/cm	--	43.60		0.1	0.1	171.36		0.1	0.1	52.68		0.1	0.1	57.98		0.1	0.1	72.29		0.1	0.1	523.72		0.1	0.1	
Dissolved Oxygen	mg/L	--	2.45		0.01	0.01	5.82		0.01	0.01	6.37		0.01	0.01	5.70		0.01	0.01	4.80		0.01	0.01	0.28		0.01	0.01	
Temperature	C	--	20.71		0.01	0.01	17.8		0.01	0.01	18.41		0.01	0.01	19.71		0.01	0.01	19.63		0.01	0.01	18.68		0.01	0.01	
Turbidity	NTU	--	2.60		0.1	0.1	0.36		0.1	0.1	0.57		0.1	0.1	0.70		0.1	0.1	1.47		0.1	0.1	0.57		0.1	0.1	
Depth to Water	ft btoc	--	6.37		0.01	0.01	13.65		0.01	0.01	10.13		0.01	0.01	8.71		0.01	0.01	8.49		0.01	0.01	9.03		0.01	0.01	
Groundwater Elevation	ft msl	--	170.04		0.01	0.01	174.30		0.01	0.01	172.39		0.01	0.01	168.64		0.01	0.01	169.34		0.01	0.01	168.25		0.01	0.01	
Oxidation Reduction Potential	millivolts	--	56.6		0.1	0.1	153.0		0.1	0.1	161.2		0.1	0.1	157.6		0.1	0.1	202.9		0.1	0.1	222.7		0.1	0.1	

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit

Qualifiers (Qual)
J = Estimated results
J+ = Estimated results biased high
U = Samples reported below their respective MDL

 = Concentration greater than Background Threshold Values
Bold font = Detected constituent

Table 1
Summary of First Semiannual 2023 Detection Monitoring Program Sampling Event Data
Dominion Energy South Carolina - Cope Station Class III Landfill
Cope, Orangeburg County, South Carolina

Parameter Name	Units	Background Threshold Values	ASD Support Well				Downgradient Wells																				
			MW-40 DUP				MW-LF-02				MW-LF-03				MW-LF-04				MW-LF-05				MW-LF-06				
			03/08/2023				03/07/2023				03/07/2023				03/07/2023				03/07/2023				03/07/2023				
Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL	Result	Qual	MDL	QL				
CCR Appendix III																											
Boron	µg/L	200	38.2		4.00	15.0	16.7		4.00	15.0	8.28	J	4.00	15.0	9.09	J	4.00	15.0	11.2	J	4.00	15.0	9.52	J	4.00	15.0	
Calcium	µg/L	15,800	35,900	J+	30.0	100	5,080	J+	30.0	100	1,510	J+	30.0	100	2,070	J+	30.0	100	2,910	J+	30.0	100	2,190	J+	30.0	100	
Chloride	mg/L	21.9	43.5		1.34	4.00	27.7		0.335	1.00	3.18		0.0670	0.200	4.72		0.0670	0.200	9.28		0.0670	0.200	8.77		0.0670	0.200	
Fluoride	mg/L	0.225	1.09	J	0.0330	0.100	0.224		0.0330	0.100	0.0330	U	0.0330	0.100	0.0330	U	0.0330	0.100	0.0696	J	0.0330	0.100	0.0362	J	0.0330	0.100	
pH	SU	3.4 - 5.8	4.04		0.01	0.01	4.08		0.01	0.01	4.53		0.01	0.01	4.53		0.01	0.01	4.32		0.01	0.01	4.46		0.01	0.01	
Sulfate	mg/L	21.6	177		2.66	8.00	8.32		0.133	0.400	0.613		0.133	0.400	2.46		0.133	0.400	0.489		0.133	0.400	0.596		0.133	0.400	
Total Dissolved Solids	mg/L	141.3	294		2.38	10.0	46.0		2.38	10.0	2.38	U	2.38	10.0	17.0		2.38	10.0	12.0		2.38	10.0	9.00	J	2.38	10.0	
Field Parameters																											
Conductivity	µS/cm	--	523.72		0.1	0.1	151.93		0.1	0.1	37.27		0.1	0.1	60.82		0.1	0.1	75.58		0.1	0.1	59.87		0.1	0.1	
Dissolved Oxygen	mg/L	--	0.28		0.01	0.01	0.25		0.01	0.01	3.29		0.01	0.01	5.15		0.01	0.01	4.55		0.01	0.01	4.10		0.01	0.01	
Temperature	C	--	18.68		0.01	0.01	23.90		0.01	0.01	23.81		0.01	0.01	23.57		0.01	0.01	23.70		0.01	0.01	23.89		0.01	0.01	
Turbidity	NTU	--	0.57		0.1	0.1	0.54		0.1	0.1	0.57		0.1	0.1	12.28		0.1	0.1	1.69		0.1	0.1	2.92		0.1	0.1	
Oxidation Reduction Potential	millivolts	--	222.7		0.1	0.1	400.3		0.1	0.1	73.7		0.1	0.1	136.7		0.1	0.1	137.2		0.1	0.1	50.1		0.1	0.1	

Notes:
MDL = Method Detection Limit
QL = Quantification Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit

Qualifiers (Qual)
J = Estimated results
J+ = Estimated results biased high
U = Samples reported below their respective MDL
 = Concentration greater than Background Threshold Values
Bold font = Detected constituent

Appendix C
First Semiannual Detection Monitoring Program
Event Field Data Sheets, Laboratory Reports, and
Data Validation Forms

COPE STATION

Date(s) Measured: 3-7-2023

Well ID	Well Diameter (inches)	Well Total Depth (ft BTOC)	Screen Length (ft)	Time Measured	Depth to Water (ft below TOC)	Comments
AS-LF-01	2	22.45 ✓	10.00	1121	8.71	
AS-LF-02	2	22.65 ✓	10.00	1023	8.49	
GW-17	2	27.00	10.00	1742	11.05	
MH-15	2	16.75	10.00	1115	14.20	
GW or MW-01	2	04.00	10.00	1028	1.77	
GW or MW-02	2		10.00	1029	2.77	Bladder pump present
GW or MW-03	2	15.27 ✓	10.00	1030	8.69	
GW or MW-04	4		20.00	1327	16.65	Bladder pump present
GW or MW-05	2	30.25 ✓	10.00	1326	15.03	
GW or MW-07	4		20.00	1216	21.31	Bladder pump present
GW or MW-10	2	35.21	10.00	1322	21.00	
GW or MW-11	2		10.00	1755	18.55	
GW or MW-12	2	30.55 ✓	10.00	1011	12.15	
GW or MW-13	2	30.30 ✓	10.00	1342	14.54	
GW or MW-14	4	149.00	20.00	1318	7.18	Bladder pump present
MW-18	2	24.78 ✓	10.00	1055	16.29	
MW-31	2	22.03 ✓	10.00	1146	9.90	
MW-32	2	26.26 ✓	10.00	1107	15.83	
MW-33	2	26.78 ✓	10.00	1151	15.53	
MW-37	2	30.05	10.00	1334	29.99	
MW-40	2	28.74 ✓	10.00	1118	9.03	
MW-41	2	24.34 ✓	10.00	1103	14.88	
MW-42	2	20.10	10.00	1051	15.58	
MW-43	2	19.00	10.00	1045	11.56	
MW-44	2	17.00	10.00	1037	7.12	
MW-45	2	20.00	10.00	1048	10.87	
MW-46	2	22.00	10.00	1100	17.66	
MW-47	2	15.00	10.00	1042	5.25	
MW-BG-06 or MW-06	2	30.33 ✓	10.00	1247	13.65	
MW-BG-16 or MW-16	2	29.28 ✓	10.00	1313	10.13	
MW-LF-01	2	17.96 ✓	10.00	1126	6.37	
MW-LF-02	2	32.40 ✓	10.00	1137	23.57	
MW-LF-03	2	31.45 ✓	10.00	1139	21.85	
MW-LF-04	2	31.25 ✓	10.00	1146	22.21	
MW-LF-05	2	29.15 ✓	10.00	1147	19.50	
MW-LF-06	2	28.22 ✓	10.00	1149	18.77	
MW-LF-07	2	40.71 ✓	10.00	1010	19.11	
MW-LF-08	2	38.50 ✓	10.00	1103	20.62	
MW-LF-09	2	33.16 ✓	10.00	1153	14.32	
MW-LF-10	2	38.84 ✓	10.00	1156	12.77	
PZ-10	2	32.49		1317	28.86	
PZ-17	2	31.51		1250	20.81	
PZ-19	2	16.24 ✓		1134	4.62	
PZ-22	2	6.98 ✓	10.35	1004	0.3	TD: 6.98 Obstruction
PZ-24	2	19.21 ✓		1113	10.47	
PZ-25	2	20.92 ✓		1116	9.12	



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: RPC	DATE: 03/7
	BY: JAH	DATE: 3/16/23

SAMPLE ID: MW-LF-01	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: 1615	DATE: 03/7	SAMPLE	TIME: 1635	DATE: 03/7
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER			PH: 4.55 SU	CONDUCTIVITY: 43.60 umhos/cm	
			ORP: 56.6 mV	DO: 2.45 mg/L	
DEPTH TO WATER: 6.49 T/ PVC			TURBIDITY: 2.60 NTU		
DEPTH TO BOTTOM: 47.87 T/ PVC 17.89			<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
WELL VOLUME: 1.88 <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			TEMPERATURE: 20.71 °C		OTHER: _____
VOLUME REMOVED: 1.0 <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			COLOR: clear		ODOR: none
COLOR: clear			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE COLOR: _____		FILTRATE ODOR: _____
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			QC SAMPLE: <input type="checkbox"/> MS/MSD <input type="checkbox"/> DU-		
			POST TURBIDITY: 1.08 NTU		TIME: 1701
COMMENTS: FBLK-COP-CCR-LF-23101-3 @1645					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1620	100	4.54	42.65	53.3	2.55	1.19	22.08	6.59	INITIAL
1625	100	4.54	43.36	55.3	2.48	1.67	20.95	6.62	↓
1630	100	4.55	43.41	55.4	2.44	2.55	20.65	6.64	↓
1635	100	4.55	43.60	56.6	2.45	2.60	20.71	6.69	1.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 3% TURB: +/- 10% or <= 5 TEMP.: +/-

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____													
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED				
1	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
1	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
1	2 L	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE:	DATE SIGNED: 03/07/23



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: <u>AGM</u>	DATE: <u>3-7-23</u>
	BY: <u>JAV</u>	DATE: <u>3/16/23</u>

SAMPLE ID: MW-LF-02	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: <u>1557</u>	DATE: <u>3-7-23</u>	SAMPLE	TIME: <u>1640</u>	DATE: <u>3-7-23</u>
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER			PH: <u>4.08</u> SU	CONDUCTIVITY: <u>151.93</u> umhos/cm	
			ORP: <u>400.3</u> mV	DO: <u>0.25</u> mg/L	
DEPTH TO WATER: <u>23.68</u> T/ PVC			TURBIDITY: <u>0.54</u> NTU		
DEPTH TO BOTTOM <u>32.40</u> T/ PVC			<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
WELL VOLUME: <u>1.4</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			TEMPERATURE: <u>23.90</u> °C		
VOLUME REMOVED <u>0.9</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			COLOR: <u>clear</u>		
COLOR: <u>clear</u>			ODOR: <u>none</u>		
TURBIDITY: <input type="checkbox"/> NONE <input checked="" type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
DISPOSAL METHOD <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			FILTRATE COLOR: _____		
			FILTRATE ODOR: _____		
			QC SAMPLE: <input type="checkbox"/> MS/MSD <input type="checkbox"/> DUP- _____		
			POST TURBIDITY <u>0.83</u> NTU TIME: <u>1650</u>		
COMMENTS:					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1600	90	4.02	186.59	279.9	1.85	10.55	26.98	23.71	INITIAL
1605	}	4.03	177.30	389.6	0.29	5.13	23.96	23.78	}
1610		4.04	165.38	391.3	0.28	1.13	24.04	23.81	
1615		4.06	160.57	390.2	0.26	3.11	24.13		
1620		4.06	159.46	388.5	0.24	1.98	24.13		
1625		4.07	153.75	392.5	0.26	0.84	24.12		
1630		4.07	156.07	393.6	0.25	1.13	24.05		
1635		4.08	153.01	398.1	0.25	0.53	24.01		
1640		4.08	151.93	400.3	0.25	0.54	23.90		

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____											
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED		
2	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: <u>RPC</u>	DATE: <u>03/7/23</u> BY: <u>JAY</u> DATE: <u>3/16/23</u>

SAMPLE ID: MW-LF-03	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: <u>1525</u>	DATE: <u>03/7</u>	SAMPLE	TIME: <u>1550</u>	DATE: <u>03/7</u>
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER	PH: <u>4.53</u> SU		CONDUCTIVITY: <u>37.27</u> umhos/cm		
DEPTH TO WATER: <u>21.98</u> T/ PVC		ORP: <u>73.7</u> mV		DO: <u>3.29</u> mg/L	
DEPTH TO BOTTOM: 21.40 T/ PVC <u>31.56</u>		TURBIDITY: <u>0.57</u> NTU			
WELL VOLUME: <u>1.58</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS		TEMPERATURE: <u>23.81</u> °C		OTHER: <u>---</u>	
VOLUME REMOVED <u>1.0</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS		COLOR: <u>Clear</u>		ODOR: <u>---</u>	
COLOR: <u>clear</u> ODOR: <u>none</u>		FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		FILTRATE COLOR: <u>clear PC</u> FILTRATE ODOR: <u>---</u>	
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		QC SAMPLE: <input type="checkbox"/> MS/MSD <input type="checkbox"/> DUP- <u>---</u>		DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER	
POST TURBIDITY <u>0.40</u> NTU		TIME: <u>1601</u>			
COMMENTS:					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1530	110	4.53	35.70	71.3	2.99	1.16	26.18	22.18	INITIAL
1535	110	4.52	36.80	72.0	3.26	0.61	24.61	22.29	↓
1540	110	4.52	37.02	72.9	3.01	0.53	24.18	22.39	
1545	110	4.53	37.16	73.6	3.15	0.83	23.70	22.51	
1550	110	4.53	37.27	73.7	3.29	0.57	23.81	22.62	1.0
15PC									

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____									
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED		NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	
2	250 mL	PLASTIC	B	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
2	250 mL	PLASTIC	A	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
1	125 mL	PLASTIC	A	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
				<input type="checkbox"/> Y	<input type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
				<input type="checkbox"/> Y	<input type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N

SHIPPING METHOD:	DATE SHIPPED:	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED: <u>3/7/23</u>



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: <u>AGM</u>	DATE: <u>3.7.23</u>
	BY: <u>JAY</u>	DATE: <u>3/16/23</u>

SAMPLE ID: MW-LF-04	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: <u>15:04</u>	DATE: <u>3.7.23</u>	SAMPLE	TIME: <u>1535</u>	DATE: <u>3.7.23</u>
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER	PH: <u>4.53</u> SU		CONDUCTIVITY: <u>60.82</u> umhos/cm		
DEPTH TO WATER: <u>22.28</u> T/ PVC		ORP: <u>137.2136</u> mV		DO: <u>5.15</u> mg/L	
DEPTH TO BOTTOM: <u>31.25</u> T/ PVC		TURBIDITY: <u>12.28</u> NTU			
WELL VOLUME: <u>1.4</u> LITERS <input type="checkbox"/> <input checked="" type="checkbox"/> GALLONS		TEMPERATURE: <u>23.57</u> °C		OTHER: _____	
VOLUME REMOVED: <u>1.1</u> LITERS <input type="checkbox"/> <input checked="" type="checkbox"/> GALLONS		COLOR: <u>clear</u>		ODOR: <u>none</u>	
COLOR: <u>hazy</u>		ODOR: <u>none</u>		FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
TURBIDITY: <input type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input checked="" type="checkbox"/> MODERATE <input type="checkbox"/> VERY		FILTRATE COLOR: _____		FILTRATE ODOR: _____	
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER		QC SAMPLE: <input type="checkbox"/> MS/MSD <input type="checkbox"/> DUP- _____		POST TURBIDITY: <u>11.3</u> NTU TIME: <u>1543</u>	
COMMENTS: _____					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1505	140	4.57	61.80	127.6	4.24	43.3	26.85	22.31	INITIAL
1510	}	4.56	64.47	125.4	4.80	28.2	24.39	}	}
1515		4.58	64.39	127.5	4.99	20.7	23.68		
1520		4.57	63.88	130.0	5.08	14.9	23.68		
1525		4.55	62.65	132.9	5.15	12.2	23.59		
1530		4.53	61.15	135.4	5.17	11.6	23.49		
1535		4.53	60.82	136.7	5.15	12.28	23.57		

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____											
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED		
2	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: <u>AGM</u>	DATE: <u>3.7.23</u>
	BY: <u>JAN</u>	DATE: <u>3/16/23</u>

SAMPLE ID: MW-LF-05	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: <u>1414</u>	DATE: <u>3.7.23</u>	SAMPLE	TIME: <u>1445</u>	DATE: <u>3.7.23</u>
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER			PH: <u>4.32</u> SU	CONDUCTIVITY: <u>75.58</u> umhos/cm	
DEPTH TO WATER: <u>19.59</u> T/ PVC			ORP: <u>137.2</u> mV	DO: <u>4.55</u> mg/L	
DEPTH TO BOTTOM: <u>29.15</u> T/ PVC			TURBIDITY: <u>1.69</u> NTU		
WELL VOLUME: <u>1.5</u> LITERS <input type="checkbox"/> <input checked="" type="checkbox"/> GALLONS			TEMPERATURE: <u>23.70</u> °C OTHER: _____		
VOLUME REMOVED: <u>1.5</u> LITERS <input type="checkbox"/> <input checked="" type="checkbox"/> GALLONS			COLOR: <u>clear</u> ODOR: <u>none</u>		
COLOR: <u>clear</u> ODOR: <u>none</u>			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE COLOR: _____ FILTRATE ODOR: _____		
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			QC SAMPLE: <input checked="" type="checkbox"/> MS/MSD <input type="checkbox"/> DUP- _____		
			POST TURBIDITY: <u>1.91</u> NTU TIME: <u>1454</u>		
COMMENTS:					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)	
1415	195	4.33	88.21	115.1	4.19	1.84	28.41	19.63	INITIAL	
1420	}	4.31	77.86	113.4	4.54	3.06	24.33	}	}	
1425		4.30	77.11	115.8	4.57	1.79	23.96			
1430		4.29	76.55	125.1	4.58	1.13	23.68			
1435		4.32	76.21	130.2	4.58	1.14	23.70			
1440		4.32	75.81	133.8	4.57	1.73	23.61			
1445		4.32	75.58	137.2	4.55	1.64	23.76			1.5

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____												
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			
2	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
2	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: CS/RC	DATE: 3/7/23
	BY: JAY	DATE: 3/16/23

SAMPLE ID: MW-LF-06	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: 1442	DATE: 3/7/23	SAMPLE	TIME: 1507	DATE: 3/7/23
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER			PH: 4.46 SU	CONDUCTIVITY: 59.87 umhos/cm	
			ORP: 50.1 mV	DO: 4.10 mg/L	
DEPTH TO WATER: 19.88 T/ PVC			TURBIDITY: 2.92 NTU		
DEPTH TO BOTTOM: 28.20 T/ PVC 28.33			<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
WELL VOLUME: 8.14 <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			TEMPERATURE: 23.89 °C OTHER:		
VOLUME REMOVED: 0.75 <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			COLOR: clear ODOR: None		
COLOR: clear ODOR: None			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE COLOR: FILTRATE ODOR:		
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			QC SAMPLE: <input checked="" type="checkbox"/> MS/MSD JY <input checked="" type="checkbox"/> DUP DU- JY		
			POST TURBIDITY: 3.54 NTU TIME: 1515		
COMMENTS:					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1447	160	4.49	58.22	40.4	4.29	26.2	25.49	19.88	INITIAL
1452	160	4.46	59.31	39.9	4.11	4.60	24.27	19.89	}
1457	160	4.46	59.33	44.5	4.08	3.46	24.09	19.90	
1502	160	4.46	59.84	48.3	4.11	3.20	24.11	19.90	
1507	160	4.46	59.87	50.1	4.10	2.92	23.89	19.90	

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____									
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED		NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED	
2	250 mL	PLASTIC	B	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
2	250 mL	PLASTIC	A	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
1	125 mL	PLASTIC	A	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
				<input type="checkbox"/> Y	<input type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N
				<input type="checkbox"/> Y	<input type="checkbox"/> N					<input type="checkbox"/> Y	<input type="checkbox"/> N

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.3.2	BY: <u>JMB</u> DATE: <u>03/08</u>	BY: <u>JAY</u> DATE: <u>3/16/08</u>

SAMPLE ID: <u>MW-06/MW-BG-06</u>	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: <u>1402</u>	DATE: <u>03/08</u>	SAMPLE	TIME: <u>1432</u>	DATE: <u>03/08</u>
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER			PH: <u>4.34</u> SU CONDUCTIVITY: <u>171.36</u> umhos/cm		
DEPTH TO WATER: <u>14.77</u> T/ PVC			ORP: <u>153.0</u> mV DO: <u>5.82</u> mg/L		
DEPTH TO BOTTOM: <u>30.35</u> T/ PVC			TURBIDITY: <u>0.36</u> NTU		
WELL VOLUME: <u>2.57</u> LITERS <input type="checkbox"/> GALLONS <input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
VOLUME REMOVED: <u>0.7</u> LITERS <input type="checkbox"/> GALLONS <input checked="" type="checkbox"/>			TEMPERATURE: <u>17.80</u> °C OTHER: _____		
COLOR: <u>Clear</u> ODOR: <u>None</u>			COLOR: <u>Clear</u> ODOR: <u>None</u>		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			FILTRATE COLOR: _____ FILTRATE ODOR: _____		
			QC SAMPLE: <input type="checkbox"/> MS/MSD <input type="checkbox"/> DUP- _____		
			COMMENTS:		

Time: 1447 Turbidity: 0.50 DTW: 14.80

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1404	130	4.32	164.62	156.7	5.31	2.13	17.66	14.77	INITIAL
1419	130	4.33	173.29	107.4	5.79	0.38	17.54	14.80	
1424	130	4.34	169.50	152.9	5.70	0.44	17.76	14.80	
1429	130	4.33	172.06	153.1	5.85	0.32	17.92	14.80	
1432	130	4.34	171.36	153.0	5.82	0.36	17.80	14.80	

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____													
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED				NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			
1	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.3.2	BY: JMB	DATE: 3/8/23
	BY: JAY	DATE: 3/14/23

SAMPLE ID: MW-16 / MW-BB-16	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: 1305	DATE: 3/8/23	SAMPLE	TIME: 1335	DATE: 3/08
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER	PH: 4.61 SU		CONDUCTIVITY: 52.68 umhos/cm		
	ORP: 161.2 mV		DO: 6.37 mg/L		
DEPTH TO WATER: 10.22 T/ PVC			TURBIDITY: 0.57 NTU		
DEPTH TO BOTTOM: 29.30 T/ PVC			<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
WELL VOLUME: 3.14 <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			TEMPERATURE: 18.41 °C		
VOLUME REMOVED: 0.7 <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			COLOR: Clear		
COLOR: Clear			ODOR: None		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			FILTRATE COLOR: <input checked="" type="checkbox"/>		
			FILTRATE ODOR: <input type="checkbox"/>		
			QC SAMPLE: <input type="checkbox"/> MS/MSD <input type="checkbox"/> DUP-		
COMMENTS:					

Time: 1353 Turbidity: 0.04 DTW: 10.34

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1310	115	7.21	53.17	111.3	6.64	0.58	20.01	10.34	INITIAL
1325	115	4.65	52.68	157.8	6.33	0.22	18.57	10.34	
1330	115	4.64	52.64	159.8	6.29	0.00	18.48	10.34	
1335	115	4.61	52.68	161.2	6.37	0.57	18.41	10.34	0.7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

PH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____													
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED				
2	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
2	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
2	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N					<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____

REVISED 06/2011



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: <u>RPC</u>	DATE: <u>03/09</u>
	BY: <u>JAV</u>	DATE: <u>3/14/23</u>

SAMPLE ID: AS-LF-01	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: <u>1150</u>	DATE: <u>03/09</u>	SAMPLE	TIME: <u>1220</u>	DATE: <u>03/09</u>
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER			PH: <u>4.57</u> SU	CONDUCTIVITY: <u>57.98</u> umhos/cm	
			ORP: <u>157.6</u> mV	DO: <u>5.70</u> mg/L	
DEPTH TO WATER: <u>8.95</u> T/ PVC			TURBIDITY: <u>0.70</u> NTU		
DEPTH TO BOTTOM: <u>22.45</u> T/ PVC			<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
WELL VOLUME: <u>2.23</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			TEMPERATURE: <u>19.71</u> °C		OTHER: _____
VOLUME REMOVED: <u>1.0</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS			COLOR: <u>Clear</u>		ODOR: <u>None</u>
COLOR: <u>Clear</u> ODOR: <u>None</u>			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE COLOR: _____		FILTRATE ODOR: _____
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			QC SAMPLE: <input type="checkbox"/> MS/MSD <input type="checkbox"/> DU-		
			POST TURBIDITY: <u>0.62</u> NTU TIME: <u>1235</u>		
COMMENTS: <u>FBLK-COP-LF-23101 @ 1228</u>					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1155	200	4.61	57.85	145.1	5.86	1.45	23.71	9.20	INITIAL
1200	200	4.58	58.81	152.0	5.84	0.63	19.59	9.20	↓
1205	200	4.58	58.30	155.9	5.84	0.66	19.37	9.20	
1210	200	4.57	58.12	157.1	5.74	0.51	19.41	9.20	
1215	200	4.56	57.98	157.3	5.69	0.80	19.59	9.20	
1220	200	4.57	57.98	157.6	5.70	0.70	19.71	9.20	

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 3% TURB: +/- 10% or <= 5 TEMP.: +/-

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____											
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED		
1	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
1	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
1	2 L	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
				<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: AGM	DATE: 3.9.23
	BY: JAY	DATE: 3/16/23

SAMPLE ID: AS-LF-02	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: 1148	DATE: 3.9.23	SAMPLE	TIME: 1225	DATE: 3.9.23
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER			PH: 4.46 SU	CONDUCTIVITY: 7229 umhos/cm	
			ORP: 202.9 mV	DO: 4.80 mg/L	
DEPTH TO WATER: 8.74 T/ PVC			TURBIDITY: 1.47 NTU		
DEPTH TO BOTTOM: 22.65 T/ PVC			<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
WELL VOLUME: 2.2 LITERS <input type="checkbox"/> GALLONS <input checked="" type="checkbox"/>			TEMPERATURE: 19.63 °C		OTHER:
VOLUME REMOVED: 1.0 LITERS <input type="checkbox"/> GALLONS <input checked="" type="checkbox"/>			COLOR: clear		ODOR: none
COLOR: clear			FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY			FILTRATE COLOR:		FILTRATE ODOR:
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER			QC SAMPLE: <input type="checkbox"/> MS/MSD <input checked="" type="checkbox"/> DU-COP-CCR-LF-231013		
			POST TURBIDITY: 1.97 NTU TIME: 1254		
COMMENTS:					

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)	
1150	120	4.59	107.39	235.6	5.58	2.98	20.0	8.82	INITIAL	
1155	}	4.51	75.89	241.6	5.17	2.35	19.25	}	}	
1200		4.49	74.29	238.6	5.11	1.52	19.39			
1205		4.47	73.44	220.3	4.99	1.29	19.67			
1210		4.47	72.92	214.4	4.95	2.04	19.57			
1215		4.47	72.84	208.6	4.90	1.41	19.55			
1220		4.47	72.82	205.3	4.90	1.75	19.52			
1225		4.46	72.29	202.9	4.86	1.47	19.63			1.0

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 3% TURB: +/- 10% or <= 5 TEMP.: +/-

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F -											
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED		
1	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
1	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
1	2 L	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input checked="" type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N
				<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N					<input type="checkbox"/>	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N

SHIPPING METHOD:	DATE SHIPPED:	AIRBILL NUMBER:
COC NUMBER:	SIGNATURE:	DATE SIGNED:



WATER SAMPLE LOG

PROJECT NAME: Dominion - Cope Station	PREPARED	CHECKED
PROJECT NUMBER: 416559.0007.0000.2.2	BY: <u>CS</u>	DATE: <u>3/18/23</u>
	BY: <u>JAY</u>	DATE: <u>3/16/23</u>

SAMPLE ID: MW-40	WELL DIAMETER: <input checked="" type="checkbox"/> 2" <input type="checkbox"/> 4" <input type="checkbox"/> 6" <input checked="" type="checkbox"/> OTHER
WELL MATERIAL: <input checked="" type="checkbox"/> PVC <input type="checkbox"/> SS <input type="checkbox"/> IRON <input type="checkbox"/> GALVANIZED STEEL <input type="checkbox"/> OTHER	
SAMPLE TYPE: <input checked="" type="checkbox"/> GW <input type="checkbox"/> WW <input type="checkbox"/> SW <input type="checkbox"/> DI <input type="checkbox"/> LEACHATE <input type="checkbox"/> OTHER	

PURGING	TIME: <u>1545</u>	DATE: <u>3/18/23</u>	SAMPLE	TIME: <u>1615</u>	DATE: <u>3/18/22</u>
PURGE METHOD: <input checked="" type="checkbox"/> PUMP PERISTALTIC PUMP <input type="checkbox"/> BAILER	PH: <u>4.04</u> SU		CONDUCTIVITY: <u>523.72</u> umhos/cm		
DEPTH TO WATER: <u>9.26</u> T/ PVC	ORP: <u>222.7</u> mV		DO: <u>0.28</u> mg/L		
DEPTH TO BOTTOM: <u>28.149</u> T/ PVC	TURBIDITY: <u>0.57</u> NTU		<input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY		
WELL VOLUME: <u>3.12</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS	TEMPERATURE: <u>18.68</u> °C		OTHER: _____		
VOLUME REMOVED: <u>0.7</u> <input type="checkbox"/> LITERS <input checked="" type="checkbox"/> GALLONS	COLOR: <u>clear</u>		ODOR: <u>N/A</u>		
COLOR: <u>clear</u> ODOR: <u>N/A</u>	FILTRATE (0.45 um) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		FILTRATE COLOR: _____		
TURBIDITY: <input checked="" type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> VERY	QC SAMPLE: <input type="checkbox"/> MS/MSD <input checked="" type="checkbox"/> DUP- <u>COPE-LF-2310 1</u>		FILTRATE ODOR: _____		
DISPOSAL METHOD: <input type="checkbox"/> GROUND <input type="checkbox"/> DRUM <input checked="" type="checkbox"/> OTHER	POST TURBIDITY: <u>0.84</u> NTU		TIME: <u>1640</u>		
	COMMENTS: <u>DU-COP-LF-2310</u>				

TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (umhos/cm)	ORP (mV)	D.O. (mg/L)	TURBIDITY (NTU)	TEMPERATURE (°C)	WATER LEVEL (FEET)	CUMULATIVE PURGE VOLUME (GALLONS)
1550	100	4.03	557.28	204.5	0.49	1.39	18.99	9.31	INITIAL
1555		4.03	545.38	219.0	0.35	1.02	18.87	9.31	
1600		4.04	541.80	225.4	0.31	0.82	18.81	9.31	
1605		4.04	533.93	222.1	0.29	0.77	18.71	9.31	
1610		4.04	523.73	222.7	0.28	0.57	18.68	9.31	0.7

NOTE: STABILIZATION TEST IS COMPLETE WHEN 3 SUCCESSIVE READINGS ARE WITHIN THE FOLLOWING LIMITS:

pH: +/- 0.1 COND.: +/- 3% ORP: +/- 10 D.O.: +/- 10% TURB: +/- 10% or <= 5 TEMP.: +/- 3%

BOTTLES FILLED		PRESERVATIVE CODES A - NONE B - HNO3 C - H2SO4 D - NaOH E - HCL F - _____												
NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			NUMBER	SIZE	TYPE	PRESERVATIVE	FILTERED			
2	250 mL	PLASTIC	B	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
2	250 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
1	125 mL	PLASTIC	A	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	N
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N
				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N				<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	N

SHIPPING METHOD: _____	DATE SHIPPED: _____	AIRBILL NUMBER: _____
COC NUMBER: _____	SIGNATURE: _____	DATE SIGNED: _____



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: <u>AquaTroll</u>	SAMPLER: <u>RLJB / AM / CS</u>
PROJECT NO.: 416559.0007.0000.2.2	SERIAL #: <u>909268</u>	DATE: <u>03/07/23</u>

PH CALIBRATION CHECK

pH 7 (LOT #): <u>22216893</u> (EXP. DATE): <u>11/23</u>	pH 4 / 10 (LOT #): <u>22250153</u> (EXP. DATE): <u>11/23</u>	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
<u>6.74 / 7.00</u>	<u>4.25 / 4.00</u>	<input checked="" type="checkbox"/> WITHIN RANGE	<u>0855</u>
<u>7.02 / 7.00</u>	<u>4.00 / 4.00</u>	<input checked="" type="checkbox"/> WITHIN RANGE	<u>0900</u>
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): <u>ALC</u> (EXP. DATE):	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
<u>4.528 / 4.49</u>	<u>22.36</u>	<input type="checkbox"/> WITHIN RANGE	
<u>4.483 / 4.49</u>	<u>22.44</u>	<input checked="" type="checkbox"/> WITHIN RANGE	<u>0905</u>
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): <u>21390144</u> (EXP. DATE): <u>11/23</u>	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
<u>239.2 / 228</u>	<u>23.00</u>	<input type="checkbox"/> WITHIN RANGE	
<u>227.9 / 228</u>	<u>23.11</u>	<input checked="" type="checkbox"/> WITHIN RANGE	<u>0915</u>
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
Temp: <u>23.03</u>	<input type="checkbox"/> WITHIN RANGE	<u>0845</u>
Boro: <u>757.06</u>	<input type="checkbox"/> WITHIN RANGE	
calc: <u>8.40</u>	<input type="checkbox"/> WITHIN RANGE	
Act: <u>9.05</u>	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): <u>N/A</u> (EXP. DATE):	(LOT #): <u>N/A</u> (EXP. DATE):		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
<u>0.04 / 0.00</u>	<u>0.01 / 0.00</u>	<input checked="" type="checkbox"/> WITHIN RANGE	<u>0910</u>
<u>0.83 / 1.00</u>	<u>1.00 / 1.00</u>	<input checked="" type="checkbox"/> WITHIN RANGE	
<u>11.6 / 10.00</u>	<u>10.04 / 10</u>	<input checked="" type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION (LOT #): <u>22250153</u> (EXP. DATE): <u>11/23</u>	<input type="checkbox"/> STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input type="checkbox"/> ORP	ORP: +/- 25 mV
<input type="checkbox"/> D.O.	D.O.: VARIES
<input type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/> _____	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
<input type="checkbox"/> _____	

NOTES

PROBLEMS ENCOUNTERED

None

CORRECTIVE ACTIONS

None

SIGNED: DATE: 03/07/23

CHECKED BY: DATE: 3/14/23



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: <u>Aqua Troll</u>	SAMPLER: <u>R JB / AM / CS</u>
PROJECT NO.: 416559.0007.0000.2.2	SERIAL #: <u>851425</u>	DATE: <u>03/7/23</u>

PH CALIBRATION CHECK

pH 7		pH 4 / 10		CAL. RANGE	TIME
(LOT #):	(EXP. DATE):	(LOT #):	(EXP. DATE):		
<u>2216893</u>	<u>11/23</u>	<u>22250153</u>	<u>11/23</u>		
PRE-CAL. READING / STANDARD		PRE-CAL. READING / STANDARD			
<u>6.84 / 7.00</u>		<u>4.15 / 4.00</u>		<input checked="" type="checkbox"/> WITHIN RANGE	<u>0855</u>
<u>7.00 / 7.00</u>		<u>7.00 / 4.00</u>		<input checked="" type="checkbox"/> WITHIN RANGE	<u>0900</u>
/		/		<input type="checkbox"/> WITHIN RANGE	
/		/		<input type="checkbox"/> WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING	TEMPERATURE	CAL. RANGE	TIME
(LOT #):	(°CELSIUS)		
<u>AIC</u>			
PRE-CAL. READING / STANDARD			
<u>4.413 / 4.49</u>	<u>23.10</u>	<input type="checkbox"/> WITHIN RANGE	
<u>4.481 / 4.49</u>	<u>23.83</u>	<input checked="" type="checkbox"/> WITHIN RANGE	<u>0905</u>
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING	TEMPERATURE	CAL. RANGE	TIME
(LOT #):	(°CELSIUS)		
<u>21390144</u>			
PRE-CAL. READING / STANDARD			
<u>224.4 / 228</u>	<u>24.60</u>	<input type="checkbox"/> WITHIN RANGE	
<u>228 / 228</u>	<u>24.30</u>	<input checked="" type="checkbox"/> WITHIN RANGE	<u>0914</u>
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING	CAL. RANGE	TIME
(mg/L)		
<u>Temp: 26.10</u>	<input type="checkbox"/> WITHIN RANGE	<u>0845</u>
<u>Boro: 756.66</u>	<input type="checkbox"/> WITHIN RANGE	
<u>calc: 8.00</u>	<input type="checkbox"/> WITHIN RANGE	
<u>Act: 8.85</u>	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #):	(LOT #):		
<u>N/A</u>	<u>N/A</u>		
PRE-CAL. READING / STANDARD		POST-CAL. READING / STANDARD	
<u>0.04 / 0.00</u>		<u>0.01 / 0.00</u>	
<u>1.23 / 1.00</u>		<u>0.87 / 1.00</u>	
<u>8.88 / 10.00</u>		<u>10.13 / 10.00</u>	
/		/	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION	<input type="checkbox"/> STANDARD SOLUTION (S)
(LOT #): <u>22250153</u>	LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
(EXP. DATE): <u>11/23</u>	
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input type="checkbox"/> ORP	ORP: +/- 25 mV
<input type="checkbox"/> D.O.	D.O.: VARIES
<input type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/> _____	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
<input type="checkbox"/> _____	

NOTES

PROBLEMS ENCOUNTERED

CORRECTIVE ACTIONS

<u>None</u>

<u>None</u>

NA 3-7-23
SIGNED DATE

[Signature] 3/16/23
CHECKED BY DATE



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: <u>Agutroll</u>	SAMPLER: JB / <u>AM</u> / CS
PROJECT NO.: 416559.0007.0000.2.2	SERIAL #: <u>883546</u>	DATE: <u>3-7-23</u>

PH CALIBRATION CHECK CAL

pH 7 (LOT #): <u>2216893</u> (EXP. DATE): <u>11/23</u>	pH 4 / 10 (LOT #): <u>22250153</u> (EXP. DATE): <u>11/23</u>	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
<u>6.82 / 7.00</u>	<u>4.22 / 4.00</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
<u>7.00 / 7.00</u>	<u>4.00 / 4.00</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): <u>N/A</u> (EXP. DATE):	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
<u>4.51 / 4.49</u>	<u>24.18</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
<u>4.49 / 4.49</u>	<u>25.10</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): <u>21390144</u> (EXP. DATE): <u>11/23</u>	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
<u>225 / 228</u>	<u>25.35</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
<u>228 / 228</u>	<u>25.39</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
<u>Temp: 25°C</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
<u>Baro: 755mmHg</u>	<input type="checkbox"/> WITHIN RANGE	
<u>calc: 8.2</u>	<input type="checkbox"/> WITHIN RANGE	
<u>actual: 8.03</u>	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): <u>N/A</u> (EXP. DATE):	(LOT #): <u>N/A</u> (EXP. DATE):		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
<u>1.05 / 0</u>	<u>0 / 0</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
<u>1.20 / 1</u>	<u>0.97 / 1</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
<u>10.24 / 10</u>	<u>9.93 / 10</u>	<input type="checkbox"/> WITHIN RANGE	<u>0846</u>
/	/	<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION (LOT #): <u>22250153</u> (EXP. DATE): <u>11/23</u>	<input type="checkbox"/> STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input type="checkbox"/> ORP	ORP: +/- 25 mV
<input type="checkbox"/> D.O.	D.O.: VARIES
<input type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/> _____	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
<input type="checkbox"/> _____	

NOTES

<u>S/N 1511-411</u>

PROBLEMS ENCOUNTERED

CORRECTIVE ACTIONS

<u>None</u>

<u>None</u>

SIGNED: [Signature] DATE: 3-7-23

CHECKED BY: [Signature] DATE: 3/16/23



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: Aqua Troll	SAMPLER: PL CS / JB / AM
PROJECT NO.: 416559.0002.0000.4.2	SERIAL #: 909268	DATE: 03/08/2023

PH CALIBRATION CHECK

pH 7 (LOT #): 2216893 (EXP. DATE): 11/2023	pH 4 / 10 (LOT #): 22250153 (EXP. DATE): 11/2023	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
6.75 / 7.00	4.24 / 4.00	<input checked="" type="checkbox"/> WITHIN RANGE	0909
7.03 / 7.00	4.01 / 4.00	<input checked="" type="checkbox"/> WITHIN RANGE	0906
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): Auto Cal Solution (EXP. DATE): AC	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
4497.5 / 4490	17.37	<input type="checkbox"/> WITHIN RANGE	
4480.7 / 4490	17.51	<input checked="" type="checkbox"/> WITHIN RANGE	0911
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21390144 (EXP. DATE): 11/2023	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
238.6 / 228	17.93	<input type="checkbox"/> WITHIN RANGE	
228.0 / 228	17.86	<input checked="" type="checkbox"/> WITHIN RANGE	0919
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
Temp: 19.37 Baro: 765.16 Calc:	<input checked="" type="checkbox"/> WITHIN RANGE	0915
Act: 9.81	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): N/A (EXP. DATE):	(LOT #): N/A (EXP. DATE):		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0.00 / 0.00	0.00 / 0.00	<input checked="" type="checkbox"/> WITHIN RANGE	0922
0.90 / 1.00	1.03 / 1.00	<input checked="" type="checkbox"/> WITHIN RANGE	0923
10.87 / 10.00	10.02 / 10.00	<input checked="" type="checkbox"/> WITHIN RANGE	0925
/	/	<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION (LOT #): 22250153 (EXP. DATE): 11/2023	<input type="checkbox"/> STANDARD SOLUTION (S)
LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK	
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input checked="" type="checkbox"/> ORP	ORP: +/- 25 mV
<input checked="" type="checkbox"/> D.O.	D.O.: VARIES
<input checked="" type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/> _____	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
<input type="checkbox"/> _____	

NOTES

PROBLEMS ENCOUNTERED

CORRECTIVE ACTIONS

None

None

SIGNED DATE 03/08/23

CHECKED BY DATE 3/16/23



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: Aquatrail 400	SAMPLER: CS / JB / AM
PROJECT NO.: 416559.0002.0000.4.2	SERIAL #: 851425	DATE: 3/18/23

PH CALIBRATION CHECK

pH 7 (LOT #): 2216893 (EXP. DATE): 11/23	pH 4 / 10 (LOT #): 21320202 (EXP. DATE): 11/23	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
6.94 / 7.00	9.91 / 10.00	<input checked="" type="checkbox"/> WITHIN RANGE	0608
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): Auto Cal Solution (EXP. DATE): AC	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
4518, 514490	22.44	<input checked="" type="checkbox"/> WITHIN RANGE	0605
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 213961144 (EXP. DATE): 11/23	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
229 / 228	22.31	<input checked="" type="checkbox"/> WITHIN RANGE	0600
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
BM Pressure - 1024 mmHg Temp - 21.86°, 100% sat cal - 92.58 Actual 100% cal - 92.43% Oxygen salinity @ 21.86° - 9.04 Actual oxygen sat - 9.01	<input checked="" type="checkbox"/> WITHIN RANGE	610
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): N/A (EXP. DATE):	(LOT #): N/A (EXP. DATE):		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0.15 / 0.00	0.04 / 0.00	<input checked="" type="checkbox"/> WITHIN RANGE	0606
1.18 / 1.00	1.03 / 1.00	<input type="checkbox"/> WITHIN RANGE	0618
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION	<input type="checkbox"/> STANDARD SOLUTION (S)
(LOT #): 22250153 (EXP. DATE): 11/23	LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input checked="" type="checkbox"/> ORP	ORP: +/- 25 mV
<input checked="" type="checkbox"/> D.O.	D.O.: VARIES
<input checked="" type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/>	
<input type="checkbox"/>	

(1) CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER

NOTES

PROBLEMS ENCOUNTERED

CORRECTIVE ACTIONS

None

None

SIGNED: [Signature] DATE: 3/18/23

CHECKED BY: [Signature] DATE: 3/16/23



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: Aquatrol	SAMPLER: CS / JB / AM
PROJECT NO.: 416559.0002.0000.4.2	SERIAL #: 883546	DATE: 3-8-23

PH CALIBRATION CHECK

pH 7 (LOT #): 2216843 (EXP. DATE): 11/23	pH 4 / 10 (LOT #): 22250153 (EXP. DATE): 11/23	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
6.79 / 7.00	4.23 / 4.00	<input type="checkbox"/> WITHIN RANGE	0900
7.00 / 7.00	4.00 / 4.00	<input type="checkbox"/> WITHIN RANGE	0900
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

Post

Post

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): Auto Cal Solution (EXP. DATE): AC	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
4.53 / 4.49	18.45	<input type="checkbox"/> WITHIN RANGE	0900
4.48 / 4.49	18.76	<input type="checkbox"/> WITHIN RANGE	0900
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
Temp: 18.5°C Baro: 765mmHg Calc: 9.4 actual: 9.35	<input type="checkbox"/> WITHIN RANGE	0900
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21390144 (EXP. DATE): 11/23	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
238 / 228	19.17	<input type="checkbox"/> WITHIN RANGE	0900
228 / 228	19.48	<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

Post

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): N/A (EXP. DATE):	(LOT #): N/A (EXP. DATE):		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0.40 / 0	0 / 0	<input type="checkbox"/> WITHIN RANGE	0900
0.90 / 1	0.98 / 1	<input type="checkbox"/> WITHIN RANGE	
11.7 / 10	10.00 / 10	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION	<input type="checkbox"/> STANDARD SOLUTION (S)
(LOT #): 22250153 (EXP. DATE): 11/23	LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input checked="" type="checkbox"/> ORP	ORP: +/- 25 mV
<input checked="" type="checkbox"/> D.O.	D.O.: VARIES
<input checked="" type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/> _____	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
<input type="checkbox"/> _____	

NOTES

S/N 1837-3919

PROBLEMS ENCOUNTERED

CORRECTIVE ACTIONS

None

None

SIGNED DATE 3-8-23

CHECKED BY DATE 3/16/23



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: AQUA TROLL 400	SAMPLER: JB / AM (CS)
PROJECT NO.: 416559.0007.0000.3.2	SERIAL #: 851425	DATE: 3-9-23

PH CALIBRATION CHECK

pH 7 (LOT #): 2216893 (EXP. DATE): 11/23	pH 4/10 (LOT #): 22250153 / 21326202 (EXP. DATE): 11/23 / 12/23	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
7.07 / 7.00	10.09 / 10.00	<input checked="" type="checkbox"/> WITHIN RANGE	0830
1	4.05 / 4.00	<input checked="" type="checkbox"/> WITHIN RANGE	0835
7.01 / 7.00	9.98 / 10.00	<input checked="" type="checkbox"/> WITHIN RANGE	0835
1	4.02 / 4.00	<input checked="" type="checkbox"/> WITHIN RANGE	0835

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): 22250153 (EXP. DATE): 11/23	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
1 228.0		<input type="checkbox"/> WITHIN RANGE	
1 228.0		<input type="checkbox"/> WITHIN RANGE	
4446.4 / 4490.0	15.12	<input checked="" type="checkbox"/> WITHIN RANGE	0837
4488.8 / 4490.0	15.21	<input type="checkbox"/> WITHIN RANGE	0839

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21390144 (EXP. DATE): 11/23	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
242.6 / 228.0	15.68	<input type="checkbox"/> WITHIN RANGE	0840
227.7 / 228.0	15.30	<input checked="" type="checkbox"/> WITHIN RANGE	0842
1		<input type="checkbox"/> WITHIN RANGE	
1		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
Baro: 1019.3mb Temp: 14.94° Act: 10.41 Calc: 10.78	<input checked="" type="checkbox"/> WITHIN RANGE	0855
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): N/A (EXP. DATE):	(LOT #): N/A (EXP. DATE):		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0.30 / 10.00	0.00 / 0.00	<input checked="" type="checkbox"/> WITHIN RANGE	0854
2.04 / 11.00	1.04 / 11.00	<input checked="" type="checkbox"/> WITHIN RANGE	0858
8.89 / 10.00	9.89 / 10.00	<input checked="" type="checkbox"/> WITHIN RANGE	0857
1	1	<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION (LOT #): 22250153 (EXP. DATE): 11/23	<input type="checkbox"/> STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH (M)	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input type="checkbox"/> ORP	ORP: +/- 25 mV
<input type="checkbox"/> D.O.	D.O.: VARIES
<input type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/> _____	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
<input type="checkbox"/> _____	

NOTES

PROBLEMS ENCOUNTERED

CORRECTIVE ACTIONS

None	None

SIGNED: Carver DATE: 3/9/23

CHECKED BY: [Signature] DATE: 3/16/23



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: AQUA TROLL 400	SAMPLER: JB / AM / CS
PROJECT NO.: 416559.0007.0000.3.2	SERIAL #: 883546	DATE: 3-9-23

PH CALIBRATION CHECK

pH 7 (LOT #): 2216893 (EXP. DATE): 11/23	pH 4 / 10 (LOT #): 22253153 (EXP. DATE): 11/23 11/23	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
6.79 / 7.00	4.26 / 4.00	<input type="checkbox"/> WITHIN RANGE	0822
7.00 / 7.00	4.00 / 4.00	<input type="checkbox"/> WITHIN RANGE	0822
/	/	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): A/C (EXP. DATE):	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
4.56 / 4.49	15.68	<input type="checkbox"/> WITHIN RANGE	0822
4.49 / 4.49	15.91	<input type="checkbox"/> WITHIN RANGE	0822
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 21390144 (EXP. DATE): 11/23	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
230 / 228	17.76	<input type="checkbox"/> WITHIN RANGE	0922
228 / 228	17.82	<input type="checkbox"/> WITHIN RANGE	0822
/		<input type="checkbox"/> WITHIN RANGE	
/		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
Temp: 16°C Baro: 765mmHg Actual: 9.92 Calc: 9.8	<input type="checkbox"/> WITHIN RANGE	0822
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	
	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): N/A (EXP. DATE):	(LOT #): N/A (EXP. DATE):		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0.25 / 0.00	0.00 / 0.00	<input type="checkbox"/> WITHIN RANGE	0822
0.76 / 1.00	0.87 / 1.00	<input type="checkbox"/> WITHIN RANGE	
11.3 / 10.00	10.00 / 10.00	<input type="checkbox"/> WITHIN RANGE	
/	/	<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION (LOT #): 22250153 (EXP. DATE): 11/23	<input type="checkbox"/> STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS <input checked="" type="checkbox"/> pH <input checked="" type="checkbox"/> COND <input type="checkbox"/> ORP <input type="checkbox"/> D.O. <input type="checkbox"/> TURB	CALIBRATION RANGES ⁽¹⁾ pH: +/- 0.2 S.U. COND: +/- 1% OF CAL. STANDARD ORP: +/- 25 mV D.O.: VARIES TURB: +/- 5% OF CAL. STANDARD <small>⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER</small>

NOTES

S/N 1837-3919

PROBLEMS ENCOUNTERED

CORRECTIVE ACTIONS

None	None

3-9-23
 SIGNED _____ DATE _____

3/14/23
 CHECKED BY _____ DATE _____

April 18, 2023

Kelly Hicks
Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, Virginia 23219

Re: CCR Groundwater Monitoring - Level 1 Package
Work Order: 613559

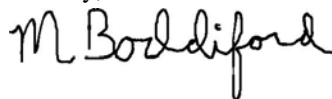
Dear Kelly Hicks:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 09, 2023. This revised data report has been prepared and reviewed in accordance with GEL's standard operating procedures. The client requested a revised report to remove the Preliminary Data watermark on the metals and GChem fractions.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1648.

Sincerely,



Meredith Boddiford
Project Manager

Purchase Order: 50149867
Chain of Custody: 228132
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.	4
Laboratory Certifications.....	8
Metals Analysis.....	10
Case Narrative.....	11
Sample Data Summary.....	15
Quality Control Summary.....	26
General Chem Analysis.....	38
Case Narrative.....	39
Sample Data Summary.....	44
Quality Control Summary.....	55

Case Narrative

The client requested a revised report to remove the Preliminary Data watermark on the metals and GChem fractions.

**Receipt Narrative
for
Dominion Energy (50149867)
SDG: 613559**

April 18, 2023

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on March 09, 2023 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

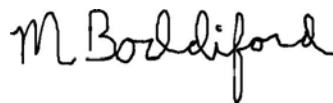
Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
613559001	MW-LF-01-2023Q1
613559002	MW-LF-02-2023Q1
613559003	MW-LF-03-2023Q1
613559004	MW-LF-04-2023Q1
613559005	MW-LF-05-2023Q1
613559006	MW-LF-06-2023Q1
613559007	MW-BG-06-2023Q1
613559008	MW-BG-16-2023Q1
613559009	MW-40-2023Q1
613559010	DU-COP-LF-23101

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry and Metals.

A handwritten signature in black ink that reads "M Boddiford". The signature is written in a cursive style with a large, looped initial "M".

Meredith Boddiford
Project Manager

Chain of Custody and Supporting Documentation

GEL **Laboratories LLC**
 Chemistry | Radiochemistry | Radiobiology | Specialty Analytics
 Chain of Custody and Analytical Request
 GEL Project Manager: Meredith Bodiford
 Phone # 803-258-1528
 Fax # _____
 GEL Work Order Number: 228132
 GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military (hhmm))	QC Code (a)	Field Filtered (b)	Sample Matrix (c)	Should this sample be considered:	Sample Analysis Requested (d) (Fill in the number of containers for each test)				Comments		
							TDS SM2540C	Cl, FL, SO4 EPA 300.0	Total Metals B Ca Ni	Preservative Type (e)			
MW-LF-01-2023Q1	3/7/23	1635	N	N	GW	(3) Known or possible hazards (Yes, please supply isotope info.)	3	X	X	X		Note: extra sample is required for sample specific QC	
MW-LF-02-2023Q1	3/7/23	1640	N	N	GW		3	X	X	X			
MW-LF-03-2023Q1	3/7/23	1550	N	N	GW		3	X	X	X			
MW-LF-04-2023Q1	3/7/23	1535	N	N	GW		3	X	X	X			
MW-LF-05-2023Q1	3/7/23	1445	N	N	GW		6	X	X	X			
FBLK-COP-LF-23101			FB	N	AQ			X	X	X			see attached work order for details
MW-LF-06-2023Q1	3/7/23	1507	N	N	GW		3	X	X	X			
MW-BG-06-2023Q1	3/8/23	1432	N	N	GW		3	X	X	X			
MW-BG-16-2023Q1	3/8/23	1335	N	N	GW		3	X	X	X			
DU-COP-LF-23101	3/8/23	-	FD	N	GW		3	X	X	X			

Chain of Custody Signatures

Relinquished By (Signed) _____ Date _____ Time _____
 Received by (signed) _____ Date _____ Time _____
 1. John Sadley 03/09/23 0840
 2. _____
 3. _____

QC Codes: N = Normal Sample, TH = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike-Sample, MSD = Matrix Spike-Duplicate Sample, G = Grab, C = Composite
 Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, P=Patrol, N=Nasal
 Sample Analysis Requested: Analytical method requested (i.e. 8260B, 8010B/476A) and number of containers provided for each (i.e. 8260B - 3, 60102/74704 - 1).
 Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sulfuric Acid, AA = Ascorbic Acid, IX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

For sample shipping and delivery details, see Sample Receipt & Review form (SRR)

Chain of Custody Number = Client Determined

QC Codes: N = Normal Sample, TH = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike-Sample, MSD = Matrix Spike-Duplicate Sample, G = Grab, C = Composite
 Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, P=Patrol, N=Nasal
 Sample Analysis Requested: Analytical method requested (i.e. 8260B, 8010B/476A) and number of containers provided for each (i.e. 8260B - 3, 60102/74704 - 1).
 Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sulfuric Acid, AA = Ascorbic Acid, IX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank

Additional Remarks: _____
 For Lab Receiving Use Only: Custody Seal Intact? [] Yes [] No Cooler Temp: _____ °C
 Sample Collection Time Zone: [X] Eastern [] Pacific [] Central [] Mountain [] Other: _____

Reinforced By (Signed) _____ Date _____ Time _____
 Received by (signed) _____ Date _____ Time _____
 1. John Sadley 03/09/23 0840
 2. _____
 3. _____

Characteristics Hazards
 FL = Flammable/Ignitable
 CO = Corrosive
 RE = Reactive
 TSCA Regulated
 PCB = Polychlorinated biphenyls

Listed Waste
 LW = Listed Waste (F, K, P and U-listed wastes.)
 Waste code(s): _____

Other
 OT = Other / Unknown
 (i.e. High/low pH, asbestos, beryllium, irritants, other misc. health hazards, etc.)
 Description: _____

Please provide any additional details below regarding handling and/or disposal concerns. (i.e.: Origin of sample(s), type of site collected from, odd matrices, etc.)

GEL Laboratories LLC
 Chemistry | Radiochemistry | Radiobiology | Specialty Analytics
 Chain of Custody and Analytical Request
 GEL Work Order Number: 228132
 Phone # 803-258-1528
 Fax #
 GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Sample ID	Date Collected (mm-dd-yy)	*Time Collected (Military) (hh:mm)	QC Code, (e)	Field Sample Matrix (e)	Radionuclide (F) Yes, please supply isotopic info)	Should this sample be considered: (7) Known or possible hazards	Total number of containers	TDS SM2540C	Cl, Fl, SO4 EPA 300.0	Total Metals B, Ca EPA 200.8	Preservative Type (6)	Comments
AS-LE-01-2023Q1			N	N	N							Note: extra sample is required for sample specific QC
AS-LE-02-2023Q1			N	N	N							
MW-40-2023Q1	3/8/23	1415	N	N	N		3	X	X	X		
EBLK-COP-LE-23-103			FB	N	AC							see attached work order for details

Chain of Custody Signatures

Relinquished By (Signed) _____ Date _____ Time _____
 Received by (signed) _____ Date _____ Time _____

1. *Thur* 03/12/23 0840
 2. _____
 3. _____

TAT Requested: Normal: Rush: Specify: _____
 Fax Results: Yes No
 Select Deliverable: C of A QC Summary Level 1 Level 2 Level 3 Level 4
 Additional Remarks:
 For Lab Receiving Use Only: Custody Seal Intact? Yes No Cooler Temp: _____ °C
 Sample Collection Time Zone: Eastern Pacific Central Mountain Other:
 > For sample shipping and delivery details, see Sample Receipt & Review form (SRR).

- Chain of Custody Number = Client Determined
 - QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 - Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 - Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Filler, U=Urine, F=Feenl, N=Nasal
 - Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7-470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7-470A - 1).
 - Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, IX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank
 - KNOWN OR POSSIBLE HAZARDS**
 Characteristic Hazards: Flammable/ignitable
 Corrosive
 Reactive
 TSCA Regulated
 PCB = Polychlorinated biphenyls
 Listed Waste: F, K, P and U-listed wastes)
 Waste code(s): _____
 Other: _____
 OT = Other / Unknown
 (i.e.: High/low pH, asbestos, beryllium, irritants, other misc. health hazards, etc.)
 Description: _____
- Please provide any additional details below regarding handling and/or disposal concerns. (i.e.: Origin of sample(s), type of site collected from, odd matrices, etc.)

SAMPLE RECEIPT & REVIEW FORM

Client: DMNN		SDG/AR/COC/Work Order: 614084	
Received By: Anna Johnson		Date Received: 03.9.23	
Enter one tracking number per line below.		IR temperature gun # _____ Daily Calibration performed? Y/N	
Enter courier if applicable and no tracking available.		Uncorrected temperature readings are to the 0.1 degree with final recorded temperatures rounded to the 0.5 degree. Provide individual container details when a cooler requiring 0 <= 60C is identified as out of specification.	
cooler # COPE Station LF CCR		Uncorrected Temp: 0.5	IR Correction Factor: +/- 0 Final Recorded Temp: 0.5 Within 0.0-6.0C? Y
		Uncorrected Temp:	IR Correction Factor: +/- Final Recorded Temp: Within 0.0-6.0C? Y/N
		Uncorrected Temp:	IR Correction Factor: +/- Final Recorded Temp: Within 0.0-6.0C? Y/N
		Uncorrected Temp:	IR Correction Factor: +/- Final Recorded Temp: Within 0.0-6.0C? Y/N
		Uncorrected Temp:	IR Correction Factor: +/- Final Recorded Temp: Within 0.0-6.0C? Y/N
		Uncorrected Temp:	IR Correction Factor: +/- Final Recorded Temp: Within 0.0-6.0C? Y/N
		Uncorrected Temp:	IR Correction Factor: +/- Final Recorded Temp: Within 0.0-6.0C? Y/N
Suspected Hazard Information		Yes	No
*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.			
A) Shipped as a DOT Hazardous?			/
B) Did the client designate the samples are to be received as radioactive?			/
C) Did the RSO classify the samples as radioactive?			/
D) Did the client designate samples are hazardous?			/
E) Did the RSO identify possible hazards?			/
Sample Receipt Criteria		Yes	NA
1 Shipping containers received intact and sealed?		/	
2 Chain of custody documents included with shipment?		/	
3 Sample containers intact and sealed?		/	
4 Samples requiring cold preservation were unpacked directly into cold storage?		/	
5 Samples requiring chemical preservation at proper pH?		/	
6 Do any samples require Volatile Analysis?			/
7 Samples received within holding time?		/	
8 Sample ID's on COC match ID's on bottles?		/	
9 Date & time on COC match date & time on bottles?		/	
10 Number of containers received match number indicated on COC?		/	X
11 Are sample containers identifiable as GEL provided by use of GEL labels?		/	
12 COC form is properly signed in relinquished/received sections?		/	
Comments (Use Continuation Form if needed): and coc does not list Anions but recieved containers for Anions... AD 3/14/23			

PM (or PMA) review: Initials **mcg** Date **3/14/23** Page **1** of **1**

Laboratory Certifications

List of current GEL Certifications as of 18 April 2023

State	Certification
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122023-4
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
Dominion Energy
SDG #: 613559

Product: Determination of Metals by ICP-MS
Analytical Method: EPA 200.8 SC_NPDES
Analytical Procedure: GL-MA-E-014 REV# 35
Analytical Batch: 2398200

Preparation Method: EPA 200.2
Preparation Procedure: GL-MA-E-016 REV# 18
Preparation Batch: 2398198

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
613559001	MW-LF-01-2023Q1
613559002	MW-LF-02-2023Q1
613559003	MW-LF-03-2023Q1
613559004	MW-LF-04-2023Q1
613559005	MW-LF-05-2023Q1
613559006	MW-LF-06-2023Q1
613559007	MW-BG-06-2023Q1
613559008	MW-BG-16-2023Q1
613559009	MW-40-2023Q1
613559010	DU-COP-LF-23101
1205345302	Method Blank (MB)ICP-MS
1205345303	Laboratory Control Sample (LCS)
1205345306	613559005(MW-LF-05-2023Q1L) Serial Dilution (SD)
1205345304	613559005(MW-LF-05-2023Q1D) Sample Duplicate (DUP)
1205345305	613559005(MW-LF-05-2023Q1S) Matrix Spike (MS)
1205348122	613559005(MW-LF-05-2023Q1PS) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Calibration Information

ICSA/ICSAB Statement

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Quality Control (QC) Information

Matrix Spike (MS/MSD) Recovery Statement

The percent recoveries (%R) obtained from the MS/MSD analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The MS/MSD (See Below) did not meet the recommended quality control acceptance criteria for percent recoveries for the following applicable analyte. The post spike recovery was within the required control limits. This verifies the absence of a matrix interference in the post-spike digested sample. The recovery may be attributed to possible sample matrix interference and/or non-homogeneity.

Sample	Analyte	Value
1205345305 (MW-LF-05-2023Q1MS)	Calcium	132* (75%-125%)

Miscellaneous Information

Additional Comments

All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

DMNN001 Dominion Energy (50149867)

Client SDG: 613559 GEL Work Order: 613559

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- N Metals--The Matrix spike sample recovery is not within specified control limits
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Alan Stanley

Date: 17 MAR 2023

Title: Team Leader

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559001

BASIS: As Received

DATE COLLECTED 07-MAR-23

CLIENT ID: MW-LF-01-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	9.44	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/16/23 23:33	230316-1	2398200
7440-70-2	Calcium	2320	ug/L	N	30.0	100	100	1	MS	PRB	03/16/23 23:33	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559002

BASIS: As Received

DATE COLLECTED 07-MAR-23

CLIENT ID: MW-LF-02-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	16.7	ug/L		4.00	15.0	15.0	1	MS	PRB	03/16/23 23:36	230316-1	2398200
7440-70-2	Calcium	5080	ug/L	N	30.0	100	100	1	MS	PRB	03/16/23 23:36	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559003

BASIS: As Received

DATE COLLECTED 07-MAR-23

CLIENT ID: MW-LF-03-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	8.28	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/16/23 23:40	230316-1	2398200
7440-70-2	Calcium	1510	ug/L	N	30.0	100	100	1	MS	PRB	03/16/23 23:40	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559004

BASIS: As Received

DATE COLLECTED 07-MAR-23

CLIENT ID: MW-LF-04-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	9.09	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/16/23 23:43	230316-1	2398200
7440-70-2	Calcium	2070	ug/L	N	30.0	100	100	1	MS	PRB	03/16/23 23:43	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID: 613559005

BASIS: As Received

DATE COLLECTED: 07-MAR-23

CLIENT ID: MW-LF-05-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	11.2	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/16/23 23:53	230316-1	2398200
7440-70-2	Calcium	2910	ug/L	N	30.0	100	100	1	MS	PRB	03/16/23 23:53	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559006

BASIS: As Received

DATE COLLECTED 07-MAR-23

CLIENT ID: MW-LF-06-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	9.52	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/17/23 00:17	230316-1	2398200
7440-70-2	Calcium	2190	ug/L	N	30.0	100	100	1	MS	PRB	03/17/23 00:17	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559007

BASIS: As Received

DATE COLLECTED 08-MAR-23

CLIENT ID: MW-BG-06-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	8.89	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/17/23 00:20	230316-1	2398200
7440-70-2	Calcium	9510	ug/L	N	30.0	100	100	1	MS	PRB	03/17/23 00:20	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559008

BASIS: As Received

DATE COLLECTED 08-MAR-23

CLIENT ID: MW-BG-16-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	8.72	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/17/23 00:24	230316-1	2398200
7440-70-2	Calcium	2480	ug/L	N	30.0	100	100	1	MS	PRB	03/17/23 00:24	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559009

BASIS: As Received

DATE COLLECTED 08-MAR-23

CLIENT ID: MW-40-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	41.8	ug/L		4.00	15.0	15.0	1	MS	PRB	03/17/23 00:27	230316-1	2398200
7440-70-2	Calcium	37000	ug/L	N	30.0	100	100	1	MS	PRB	03/17/23 00:27	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613559

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613559010

BASIS: As Received

DATE COLLECTED 08-MAR-23

CLIENT ID: DU-COP-LF-23101

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	38.2	ug/L		4.00	15.0	15.0	1	MS	PRB	03/17/23 00:30	230316-1	2398200
7440-70-2	Calcium	35900	ug/L	N	30.0	100	100	1	MS	PRB	03/17/23 00:30	230316-1	2398200

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2398200	2398198	EPA 200.2	50	mL	50	mL	03/14/23	CD3

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

Quality Control Summary

METALS

-2a-

Initial and Continuing Calibration Verification

SDG No: 613559

Contract: DMNN00101

Lab Code: GEL

Instrument ID: ICPMS15

Sample ID	Analyte	Result	Units	True Value	Units	% Recovery	Acceptance Window (%R)	M*	Analysis Date/Time	Run Number
ICV01	Boron	97.6	ug/L	100	ug/L	97.6	90.0 - 110.0	MS	16-MAR-23 22:53	230316-1
	Calcium	4940	ug/L	5000	ug/L	98.8	90.0 - 110.0	MS	16-MAR-23 22:53	230316-1
CCV01	Boron	94.4	ug/L	100	ug/L	94.4	90.0 - 110.0	MS	16-MAR-23 23:10	230316-1
	Calcium	4940	ug/L	5000	ug/L	98.8	90.0 - 110.0	MS	16-MAR-23 23:10	230316-1
CCV02	Boron	95.9	ug/L	100	ug/L	95.9	90.0 - 110.0	MS	16-MAR-23 23:20	230316-1
	Calcium	4980	ug/L	5000	ug/L	99.5	90.0 - 110.0	MS	16-MAR-23 23:20	230316-1
CCV03	Boron	96.8	ug/L	100	ug/L	96.8	90.0 - 110.0	MS	16-MAR-23 23:47	230316-1
	Calcium	5000	ug/L	5000	ug/L	100.1	90.0 - 110.0	MS	16-MAR-23 23:47	230316-1
CCV04	Boron	97.7	ug/L	100	ug/L	97.7	90.0 - 110.0	MS	17-MAR-23 00:10	230316-1
	Calcium	5010	ug/L	5000	ug/L	100.2	90.0 - 110.0	MS	17-MAR-23 00:10	230316-1
CCV05	Boron	97.2	ug/L	100	ug/L	97.2	90.0 - 110.0	MS	17-MAR-23 00:44	230316-1
	Calcium	5020	ug/L	5000	ug/L	100.4	90.0 - 110.0	MS	17-MAR-23 00:44	230316-1

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-2b-
CRDL Standard for ICP & ICPMS

SDG No: 613559

Contract: DMNN00101

Lab Code: GEL

Instrument ID: ICPMS15

<i>Sample ID</i>	<i>Analyte</i>	<i>Result</i>	<i>Units</i>	<i>True Value</i>	<i>Units</i>	<i>% Recovery</i>	<i>Advisory Limits (%R)</i>	<i>M*</i>	<i>Analysis Date/Time</i>	<i>Run Number</i>
CRDL01	Boron	15.1	ug/L	15	ug/L	100.6	70.0 - 130.0	MS	16-MAR-23 22:59	230316-1
	Calcium	231	ug/L	200	ug/L	115.4	70.0 - 130.0	MS	16-MAR-23 22:59	230316-1
CRDL02	Boron	15.7	ug/L	15	ug/L	104.6	70.0 - 130.0	MS	17-MAR-23 00:34	230316-1
	Calcium	225	ug/L	200	ug/L	112.6	70.0 - 130.0	MS	17-MAR-23 00:34	230316-1

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

Metals
-3a-
Initial and Continuing Calibration Blank Summary

SDG No.: 613559

Contract: DMNN00101

Lab Code: GEL

<u>Sample ID</u>	<u>Analyte</u>	<u>Result ug/L</u>	<u>Acceptance</u>	<u>Conc Qual</u>	<u>MDL</u>	<u>RDL</u>	<u>Matrix</u>	<u>M*</u>	<u>Analysis Date/Time</u>	<u>Run</u>
ICB01	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-MAR-23 22:56	230316-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-MAR-23 22:56	230316-1
CCB01	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-MAR-23 23:13	230316-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-MAR-23 23:13	230316-1
CCB02	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-MAR-23 23:23	230316-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-MAR-23 23:23	230316-1
CCB03	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-MAR-23 23:50	230316-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-MAR-23 23:50	230316-1
CCB04	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	17-MAR-23 00:13	230316-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	17-MAR-23 00:13	230316-1
CCB05	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	17-MAR-23 00:47	230316-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	17-MAR-23 00:47	230316-1

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 613559
Contract: DMNN00101
Matrix: GW

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1205345302	Calcium	30.0	ug/L	+/-50	U	MS	30.0	100
	Boron	4.00	ug/L	+/-7.5	U	MS	4.00	15.0

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS

-4-

Interference Check Sample

SDG No: 613559

Contract: DMNN00101

Lab Code: GEL

Instrument: ICPMS15

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>True Value</u>	<u>Units</u>	<u>% Recovery</u>	<u>Acceptance Window (%R)</u>	<u>Analysis Date/Time</u>	<u>Run Number</u>
ICSA01	Calcium	95500	ug/L	100000	ug/L	95.5	80.0 - 120.0	16-MAR-23 23:03	230316-1
	Boron	4.27	ug/L					16-MAR-23 23:03	230316-1
ICSAB01	Boron	21.1	ug/L	22.06	ug/L	95.8	80.0 - 120.0	16-MAR-23 23:06	230316-1
	Calcium	94100	ug/L	100000	ug/L	94.1	80.0 - 120.0	16-MAR-23 23:06	230316-1
ICSA02	Boron	4.2	ug/L					17-MAR-23 00:37	230316-1
	Calcium	93900	ug/L	100000	ug/L	93.9	80.0 - 120.0	17-MAR-23 00:37	230316-1
ICSAB02	Boron	22.4	ug/L	22.06	ug/L	102	80.0 - 120.0	17-MAR-23 00:40	230316-1
	Calcium	95400	ug/L	100000	ug/L	95.5	80.0 - 120.0	17-MAR-23 00:40	230316-1

METALS

-5a-

Matrix Spike Summary

SDG NO. 613559 Client ID: MW-LF-05-2023Q1S

Contract: DMNN00101 Level: Low

Matrix: GROUND WATER % Solids:

Sample ID: 613559005 Spike ID: 1205345305

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Boron	ug/L	75-125	119		11.2	B	100	108		MS
Calcium	ug/L	75-125	5550		2910		2000	132	N	MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS

-5a-

Spike Summary

SDG NO. 613559 Client ID: MW-LF-05-2023Q1PS

Contract: DMNN00101 Level: Low

Matrix: GROUND WATER % Solids:

Sample ID: 613559005 Spike ID: 1205348122

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Calcium	ug/L	75-125	4920		2910		2000	100		MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

Metals
-6-
Duplicate Sample Summary

SDG No.: 613559

Lab Code: GEL

Contract: DMNN00101

Client ID: MW-LF-05-2023Q1D

Matrix: GROUND WATER

Level: Low

Sample ID: 613559005

Duplicate ID: 1205345304

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Boron	ug/L	+/-30	11.2 B		11.2 B		.313		MS
Calcium	ug/L	+/-20%	2910		3080		5.49		MS

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 613559

Contract: DMNN00101

Aqueous LCS Source: Enviromental Express

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1205345303	Boron	ug/L	100	91.9		91.9	85-115	MS
	Calcium	ug/L	2000	2130		106	85-115	MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 613559 Client ID: MW-LF-05-2023Q1L

Contract: DMNN00101

Matrix: LIQUID Level: Low

Sample ID: 613559005 Serial Dilution ID: 1205345306

<u>Analyte</u>	<u>Initial Value</u> <u>ug/L</u>	<u>C</u>	<u>Serial Value</u> <u>ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Boron	11.2	B	23	B	105.606			MS
Calcium	2910		2880		.961			MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-13-
SAMPLE PREPARATION SUMMARY

SDG No: 613559

Method Type: MS

Contract: DMNN00101

Lab Code: GEL

<u>Sample ID</u>	<u>Client ID</u>	<u>Sample Type</u>	<u>Matrix</u>	<u>Prep Date</u>	<u>Initial Sample Size</u>	<u>Final Sample Volume</u>	<u>Percent Solids</u>
Batch Number	2398198						
1205345302	MB for batch 2398198	MB	G	14-MAR-23	50mL	50mL	
1205345303	LCS for batch 2398198	LCS	G	14-MAR-23	50mL	50mL	
1205345305	MW-LF-05-2023Q1S	MS	G	14-MAR-23	50mL	50mL	
1205345304	MW-LF-05-2023Q1D	DUP	G	14-MAR-23	50mL	50mL	
613559001	MW-LF-01-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559002	MW-LF-02-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559003	MW-LF-03-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559004	MW-LF-04-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559005	MW-LF-05-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559006	MW-LF-06-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559007	MW-BG-06-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559008	MW-BG-16-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559009	MW-40-2023Q1	SAMPLE	G	14-MAR-23	50mL	50mL	
613559010	DU-COP-LF-23101	SAMPLE	G	14-MAR-23	50mL	50mL	

EPA

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
Dominion Energy
SDG #: 613559**

Product: Ion Chromatography

Analytical Method: EPA 300.0

Analytical Procedure: GL-GC-E-086 REV# 30

Analytical Batch: 2398514

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
613559001	MW-LF-01-2023Q1
613559002	MW-LF-02-2023Q1
613559003	MW-LF-03-2023Q1
613559004	MW-LF-04-2023Q1
613559005	MW-LF-05-2023Q1
613559006	MW-LF-06-2023Q1
613559007	MW-BG-06-2023Q1
613559008	MW-BG-16-2023Q1
613559009	MW-40-2023Q1
613559010	DU-COP-LF-23101
1205345842	Method Blank (MB)
1205345843	Laboratory Control Sample (LCS)
1205345844	613559005(MW-LF-05-2023Q1) Sample Duplicate (DUP)
1205345845	613559005(MW-LF-05-2023Q1) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Chloride	1205345845 (MW-LF-05-2023Q1PS)	120* (90%-110%)

Technical Information

Sample Dilutions

The following samples 613559002 (MW-LF-02-2023Q1), 613559007 (MW-BG-06-2023Q1), 613559009 (MW-40-2023Q1) and 613559010 (DU-COP-LF-23101) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	613559			
	002	007	009	010
Chloride	5X	5X	20X	20X
Sulfate	1X	1X	20X	20X

Miscellaneous Information

Manual Integrations

Samples 613559003 (MW-LF-03-2023Q1) and 613559006 (MW-LF-06-2023Q1) were manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Product: Solids, Total Dissolved
Analytical Method: SM 2540C
Analytical Procedure: GL-GC-E-001 REV# 20
Analytical Batch: 2398128

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
613559001	MW-LF-01-2023Q1
613559002	MW-LF-02-2023Q1
613559003	MW-LF-03-2023Q1
613559004	MW-LF-04-2023Q1
613559005	MW-LF-05-2023Q1
613559006	MW-LF-06-2023Q1
613559007	MW-BG-06-2023Q1
613559008	MW-BG-16-2023Q1
613559009	MW-40-2023Q1
613559010	DU-COP-LF-23101
1205345140	Method Blank (MB)
1205345141	Laboratory Control Sample (LCS)
1205345142	613553011(NonSDG) Sample Duplicate (DUP)
1205345143	613559005(MW-LF-05-2023Q1) Sample Duplicate (DUP)
1205345144	614004001(NonSDG) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Total Dissolved Solids	1205345142 (Non SDG 613553011DUP)	5.59* (0%-5%)

Miscellaneous Information

Additional Comments

All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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Qualifier Definition Report for

DMNN001 Dominion Energy (50149867)

Client SDG: 613559 GEL Work Order: 613559


The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Aubrey Kingsbury

Date: 22 MAR 2023

Title: Team Leader

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
 Address : 120 Tredegar Street
 Richmond, Virginia 23219
 Contact: Kelly Hicks
 Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-01-2023Q1	Project: DMNN00101
Sample ID: 613559001	Client ID: DMNN001
Matrix: GW	
Collect Date: 07-MAR-23 16:35	
Receive Date: 09-MAR-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		7.97	0.0670	0.200	mg/L		1	HXC1	03/14/23	1719	2398514	1
Fluoride	J	0.0575	0.0330	0.100	mg/L		1					
Sulfate	J	0.196	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-02-2023Q1 Project: DMNN00101
Sample ID: 613559002 Client ID: DMNN001
Matrix: GW
Collect Date: 07-MAR-23 16:40
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride		0.224	0.0330	0.100	mg/L		1	HXC1	03/14/23	1749	2398514	1
Sulfate		8.32	0.133	0.400	mg/L		1					
Chloride		27.7	0.335	1.00	mg/L		5	HXC1	03/15/23	0335	2398514	2
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		46.0	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	3

The following Analytical Methods were performed:

Method	Description	Analyst	Comments
1	EPA 300.0		
2	EPA 300.0		
3	SM 2540C		

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-03-2023Q1 Project: DMNN00101
Sample ID: 613559003 Client ID: DMNN001
Matrix: GW
Collect Date: 07-MAR-23 15:50
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		3.18	0.0670	0.200	mg/L		1	HXC1	03/14/23	1820	2398514	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate		0.613	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-04-2023Q1 Project: DMNN00101
Sample ID: 613559004 Client ID: DMNN001
Matrix: GW
Collect Date: 07-MAR-23 15:35
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		4.72	0.0670	0.200	mg/L		1	HXC1	03/14/23	1851	2398514	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate		2.46	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		17.0	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
 Address : 120 Tredegar Street
 Richmond, Virginia 23219
 Contact: Kelly Hicks
 Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-05-2023Q1	Project: DMNN00101
Sample ID: 613559005	Client ID: DMNN001
Matrix: GW	
Collect Date: 07-MAR-23 14:45	
Receive Date: 09-MAR-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		9.28	0.0670	0.200	mg/L		1	HXC1	03/14/23	1922	2398514	1
Fluoride	J	0.0696	0.0330	0.100	mg/L		1					
Sulfate		0.489	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		12.0	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-06-2023Q1 Project: DMNN00101
Sample ID: 613559006 Client ID: DMNN001
Matrix: GW
Collect Date: 07-MAR-23 15:07
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		8.77	0.0670	0.200	mg/L		1	HXC1	03/14/23	1952	2398514	1
Fluoride	J	0.0362	0.0330	0.100	mg/L		1					
Sulfate		0.596	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	J	9.00	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
 Address : 120 Tredegar Street
 Richmond, Virginia 23219
 Contact: Kelly Hicks
 Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-BG-06-2023Q1	Project: DMNN00101
Sample ID: 613559007	Client ID: DMNN001
Matrix: GW	
Collect Date: 08-MAR-23 14:32	
Receive Date: 09-MAR-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride	J	0.0806	0.0330	0.100	mg/L		1	HXC1	03/14/23	2023	2398514	1
Sulfate	J	0.239	0.133	0.400	mg/L		1					
Chloride		17.8	0.335	1.00	mg/L		5	HXC1	03/15/23	0406	2398514	2
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		65.0	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-BG-16-2023Q1 Project: DMNN00101
Sample ID: 613559008 Client ID: DMNN001
Matrix: GW
Collect Date: 08-MAR-23 13:35
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		5.20	0.0670	0.200	mg/L		1	HXC1	03/14/23	2054	2398514	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate		1.87	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		20.0	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-40-2023Q1 Project: DMNN00101
Sample ID: 613559009 Client ID: DMNN001
Matrix: GW
Collect Date: 08-MAR-23 14:15
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride		0.886	0.0330	0.100	mg/L		1	HXC1	03/14/23	2125	2398514	1
Chloride		43.6	1.34	4.00	mg/L		20	HXC1	03/15/23	0436	2398514	2
Sulfate		169	2.66	8.00	mg/L		20					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		287	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: DU-COP-LF-23101

Project: DMNN00101

Sample ID: 613559010

Client ID: DMNN001

Matrix: GW

Collect Date: 08-MAR-23 12:00

Receive Date: 09-MAR-23

Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		43.5	1.34	4.00	mg/L		20	HXC1	03/15/23	0640	2398514	1
Sulfate		177	2.66	8.00	mg/L		20					
Fluoride		1.09	0.0330	0.100	mg/L		1	HXC1	03/14/23	2156	2398514	2
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		294	2.38	10.0	mg/L			CH6	03/14/23	1344	2398128	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: March 22, 2023

Page 1 of 3

Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, Virginia

Contact: Kelly Hicks

Workorder: 613559

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	2398514										
QC1205345844	613559005	DUP									
Chloride		9.28		9.31	mg/L	0.225		(0%-20%)	HXC1	03/15/23	01:31
Fluoride	J	0.0696	J	0.0627	mg/L	10.4	^	(+/-0.100)			
Sulfate		0.489		0.404	mg/L	18.9	^	(+/-0.400)			
QC1205345843	LCS										
Chloride	5.00			4.83	mg/L			96.5 (90%-110%)		03/15/23	01:01
Fluoride	2.50			2.48	mg/L			99 (90%-110%)			
Sulfate	10.0			9.94	mg/L			99.4 (90%-110%)			
QC1205345842	MB										
Chloride			U	ND	mg/L					03/15/23	00:30
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1205345845	613559005	PS									
Chloride	5.00	9.28		15.3	mg/L			120* (90%-110%)		03/15/23	02:02
Fluoride	2.50	J 0.0696		2.64	mg/L			103 (90%-110%)			
Sulfate	10.0	0.489		10.3	mg/L			98.1 (90%-110%)			

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QC Summary

Workorder: 613559

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	2398128										
QC1205345142	613553011	DUP									
Total Dissolved Solids		139		147	mg/L	5.59*		(0%-5%)	CH6	03/14/23	13:44
QC1205345143	613559005	DUP									
Total Dissolved Solids		12.0		13.0	mg/L	8 ^		(+/-10.0)		03/14/23	13:44
QC1205345144	614004001	DUP									
Total Dissolved Solids		124		129	mg/L	3.95		(0%-5%)		03/14/23	13:44
QC1205345141	LCS										
Total Dissolved Solids	300			301	mg/L		100	(95%-105%)		03/14/23	13:44
QC1205345140	MB										
Total Dissolved Solids			U	ND	mg/L					03/14/23	13:44

Notes:

The Qualifiers in this report are defined as follows:

- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- J Value is estimated
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- H Analytical holding time was exceeded
- < Result is less than value reported
- > Result is greater than value reported
- h Preparation or preservation holding time was exceeded
- R Sample results are rejected
- Z Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.
- d 5-day BOD--The 2:1 depletion requirement was not met for this sample
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- N1 See case narrative

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 613559

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
R											
B											
e											
J											

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

March 22, 2023

Kelly Hicks
Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, Virginia 23219

Re: CCR Groundwater Monitoring - Level 1 Package
Work Order: 613711

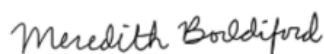
Dear Kelly Hicks:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on March 09, 2023. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1648.

Sincerely,



Meredith Boddiford
Project Manager

Purchase Order: 50149867
Chain of Custody: 228132
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.	3
Laboratory Certifications.....	7
Metals Analysis.....	9
Case Narrative.....	10
Sample Data Summary.....	13
Quality Control Summary.....	17
General Chem Analysis.....	29
Case Narrative.....	30
Sample Data Summary.....	34
Quality Control Summary.....	38

Case Narrative

**Receipt Narrative
for
Dominion Energy (50149867)
SDG: 613711**

March 22, 2023

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on March 09, 2023 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
613711001	FBLK-COP-LF-23101
613711002	AS-LF-01-2023Q1
613711003	AS-LF-02-2023Q1

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry and Metals.

Meredith Boddiford

Meredith Boddiford
Project Manager

Chain of Custody and Supporting Documentation

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (a)	Field Filtered (b)	Sample Matrix (c)	Radioactive (If yes, please supply isotopic info.)	Should this sample be considered:	Sample Analysis Requested (5) (Fill in the number of containers for each test)				Comments		
								(7) Known or possible Hazards	Total number of containers	TDS	Cl, FL, SO4		EPA 300.0	Total Metals B, Ca
MAW-LF-01-2023Q1			N	N	GW	N								
MW-LF-02-2023Q1			N	N	GW	N								
MAW-LF-03-2023Q1			N	N	GW	N								
MW-LF-04-2023Q1			N	N	GW	N								
MAW-LF-05-2023Q1			N	N	GW	N								
FBLK-COP-LF-23101	3-9-23	1228	FB	N	AQ	N	3	X	X	X				see attached work order for details
MAW-LF-06-2023Q1			N	N	GW	N								
MW-BG-06-2023Q1			N	N	GW	N								
MW-BG-16-2023Q1			N	N	GW	N								
DU-COP-LF-22301			FD	N	GW	N								

Chain of Custody Signatures

Relinquished By (Signed)	Date	Time	Received by (Signed)	Date	Time
Thulu	3/9/23	1530	[Signature]	3/9/23	1530

Relinquished By (Signed) Date Time Received by (Signed) Date Time
 Select Deliverable: C of A QC Summary Level 1 Level 2 Level 3 Level 4
 Additional Remarks:
 For Lab Receiving Use Only: Custody Seal Intact? Yes No Cooler Temp: _____ °C
 Sample Collection Time Zone: Eastern Pacific Central Mountain Other:

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Urine, F=Feecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate. If no preservative is added = leave field blank
 7.) **KNOWN OR POSSIBLE HAZARDS**
 Characteristic Hazards: FL = Flammable/Ignitable, CO = Corrosive, RE = Reactive
 Listed Waste: LW = Listed Waste (F, K, P and U-listed wastes), Waste code(s):
 Other: OT = Other / Unknown (i.e.: High/low pH, asbestos, beryllium, irritants, other misc. health hazards, etc.)
 RCRA Metals: As = Arsenic, Ba = Barium, Cd = Cadmium, Cr = Chromium, Hg = Mercury, Pb = Lead, Se = Selenium, Ag = Silver, MR = Misc. RCRA metals
 TSCA Regulated: PCB = Polychlorinated biphenyls
 Please provide any additional details below regarding handling and/or disposal concerns. (i.e.: Origin of sample(s), type of site collected from, odd matrices, etc.)

GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military (hhmm))	QC Code (a)	Field Filtered (b)	Sample Matrix (c)	Radioactive (FF) Yes, please supply isotopic info.)	(7) Known or possible Hazards considered:	Total number of containers	Sample Analysis Requested (6) (Fill in the number of containers for each test)	Preservative Type (6)	Comments
AS-01-2023Q1	3-9-23	1220	N	N	GW	N	TDS SM2540C Cl, FL, SO4 EPA 300.0 Total Metals B, Ca EPA 200.8	3			Note: extra sample is required for sample specific QC
AS-02-2023Q1	3-9-23	1225	N	N	GW	N		3			
AW-03-2023Q1			N	N	GW	N					
HBK-COP-LF-23102			FB	N	AQ	N					see attached work order for details

Chain of Custody Signatures

Relinquished by (Signed)	Date	Received by (Signed)	Date	Time
<i>[Signature]</i>	3/9/23	<i>[Signature]</i>	3/9/23	1530

TAT Requested: Normal: Rush: Specify: _____
 Fax Results: Yes No
 Select Deliverable: C of A QC Summary Level 1 Level 2 Level 3 Level 4
 Additional Remarks:
 For Lab Receiving Use Only: Custody Seal Intact? Yes No Cooler Temp: _____ °C
 Sample Collection Time Zone: Eastern Pacific Central Mountain Other:

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW=Drinking Water, GW=Groundwater, SW=Surface Water, WW=Waste Water, W=Water, ML=Misc Liquid, SO=Soil, SD=Sediment, SL=Sludge, SS=Solid Waste, O=Oil, F=Filter, P=Wipe, U=Urine, F=Fecal, N=Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8260B, 6010B, 7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, HX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank
 7.) **KNOWN OR POSSIBLE HAZARDS**
 Characteristic Hazards: FL = Flammable/Ignitable, CO = Corrosive, RE = Reactive
 Listed Waste: LW = Listed Waste (F, K, P and U-listed wastes), Waste code(s):
 TSCA Regulated: Ag=Silver, Cr=Chromium, MIR=Misc. RCRA metals biphenyls
 Other: OT= Other / Unknown (i.e.: High/low pH, asbestos, beryllium, irritants, other misc. health hazards, etc.)
 Description:
 Please provide any additional details below regarding handling and/or disposal concerns. (i.e.: Origin of sample(s), type of site collected from, odd matrices, etc.)

SAMPLE RECEIPT & REVIEW FORM *MPB*

Client: <i>DMN</i>		SDG/AR/COC/Work Order: <i>613711 613719 613708 613705</i>	
Received By:		Date Received: <i>03-09-2023</i>	
Enter one tracking number per line below.		IR temperature gun # <i>1222</i> Daily Calibration performed? Y/N	
Enter courier if applicable and no tracking available.		Uncorrected temperature readings are to the 0.1 degree with final recorded temperatures rounded to the 0.5 degree. Provide individual container details when a cooler requiring 0 <= 6°C is identified as out of specification.	
<i>cooler 1</i>	Uncorrected Temp: <i>44</i>	IR Correction Factor: +/- <i>0</i>	Final Recorded Temp: <i>4.5</i> Within 0.0-6.0C? <i>Y/N</i>
<i>cooler 2</i>	Uncorrected Temp: <i>32</i>	IR Correction Factor: +/- <i>0</i>	Final Recorded Temp: <i>3.0</i> Within 0.0-6.0C? <i>Y/N</i>
<i>cooler 3</i>	Uncorrected Temp: <i>38</i>	IR Correction Factor: +/- <i>0</i>	Final Recorded Temp: <i>4.5</i> Within 0.0-6.0C? <i>Y/N</i>
	Uncorrected Temp:	IR Correction Factor: +/-	Final Recorded Temp: Within 0.0-6.0C? Y/N
	Uncorrected Temp:	IR Correction Factor: +/-	Final Recorded Temp: Within 0.0-6.0C? Y/N
	Uncorrected Temp:	IR Correction Factor: +/-	Final Recorded Temp: Within 0.0-6.0C? Y/N
Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
A) Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: UN#: If UN2910, Is the Radioactive Shipment Survey Compliant? Yes ___ No ___
B) Did the client designate the samples are to be received as radioactive?		<input checked="" type="checkbox"/>	COC notation or radioactive stickers on containers equal client designation.
C) Did the RSO classify the samples as radioactive?		<input checked="" type="checkbox"/>	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <i>2</i> CPM/mR/Hr Classified as: Rad 1 Rad 2 Rad 3
D) Did the client designate samples are hazardous?		<input checked="" type="checkbox"/>	COC notation or hazard labels on containers equal client designation.
E) Did the RSO identify possible hazards?		<input checked="" type="checkbox"/>	If D or E is yes, select Hazards below. PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			Circle Applicable: Client contacted and provided COC COC created upon receipt
3 Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
4 Samples requiring cold preservation were unpacked directly into cold storage?	<input checked="" type="checkbox"/>			Uncorrected Temp: Correction Factor: +/- Final Recorded Temp: Within 0.0-6.0C? Y/N NA Response = Samples are for radiochemistry testing only
5 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's and Containers Affected: If Preservative added, Log:
6 Do any samples require Volatile Analysis?			<input checked="" type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer) Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No) Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___ Sample ID's and containers affected:
7 Samples received within holding time?	<input checked="" type="checkbox"/>			ID's and tests affected:
8 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			ID's and containers affected:
9 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
10 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Circle Applicable: No container count on COC Other (describe)
11 Are sample containers identifiable as GEL provided by use of GEL labels?	<input checked="" type="checkbox"/>			
12 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials *AM* Date *3/9/23* Page *1* of *1*

Laboratory Certifications

List of current GEL Certifications as of 22 March 2023

State	Certification
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2019020
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122023-4
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-22-20
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
Dominion Energy
SDG #: 613711

Product: Determination of Metals by ICP-MS

Analytical Method: EPA 200.8 SC_NPDES

Analytical Procedure: GL-MA-E-014 REV# 35

Analytical Batch: 2396486

Preparation Method: EPA 200.2

Preparation Procedure: GL-MA-E-016 REV# 18

Preparation Batch: 2396485

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
613711001	FBLK-COP-LF-23101
613711002	AS-LF-01-2023Q1
613711003	AS-LF-02-2023Q1
1205341600	Method Blank (MB) ICP-MS
1205341601	Laboratory Control Sample (LCS)
1205341604	613711002(AS-LF-01-2023Q1L) Serial Dilution (SD)
1205341602	613711002(AS-LF-01-2023Q1D) Sample Duplicate (DUP)
1205341603	613711002(AS-LF-01-2023Q1S) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Calibration Information

ICSA/ICSAB Statement

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Miscellaneous Information

Additional Comments

All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

DMNN001 Dominion Energy (50149867)

Client SDG: 613711 GEL Work Order: 613711

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Edmund Frampton

Date: 14 MAR 2023

Title: Group Leader

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613711

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613711001

BASIS: As Received

DATE COLLECTED 09-MAR-23

CLIENT ID: FBLK-COP-LF-23101

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: AQ

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	4.00	ug/L	U	4.00	15.0	15.0	1	MS	PRB	03/12/23 17:31	230312-1	2396486
7440-70-2	Calcium	30.0	ug/L	U	30.0	100	100	1	MS	PRB	03/12/23 17:31	230312-1	2396486

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2396486	2396485	EPA 200.2	50	mL	50	mL	03/10/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613711

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID: 613711002

BASIS: As Received

DATE COLLECTED: 09-MAR-23

CLIENT ID: AS-LF-01-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	9.13	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/12/23 17:34	230312-1	2396486
7440-70-2	Calcium	3570	ug/L		30.0	100	100	1	MS	PRB	03/12/23 17:34	230312-1	2396486

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2396486	2396485	EPA 200.2	50	mL	50	mL	03/10/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 613711

CONTRACT: DMNN00101

METHOD TYPE: EPA

SAMPLE ID:613711003

BASIS: As Received

DATE COLLECTED 09-MAR-23

CLIENT ID: AS-LF-02-2023Q1

LEVEL: Low

DATE RECEIVED: 09-MAR-23

MATRIX: GW

%SOLIDS: 0

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	12.2	ug/L	J	4.00	15.0	15.0	1	MS	PRB	03/12/23 17:59	230312-1	2396486
7440-70-2	Calcium	3280	ug/L		30.0	100	100	1	MS	PRB	03/12/23 17:59	230312-1	2396486

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2396486	2396485	EPA 200.2	50	mL	50	mL	03/10/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

Quality Control Summary

METALS

-2a-

Initial and Continuing Calibration Verification

SDG No: 613711

Contract: DMNN00101

Lab Code: GEL

Instrument ID: ICPMS15

Sample ID	Analyte	Result	Units	True Value	Units	% Recovery	Acceptance Window (%R)	M*	Analysis Date/Time	Run Number
ICV01	Boron	98.7	ug/L	100	ug/L	98.7	90.0 - 110.0	MS	12-MAR-23 12:27	230312-1
	Calcium	5000	ug/L	5000	ug/L	99.9	90.0 - 110.0	MS	12-MAR-23 12:27	230312-1
CCV01	Boron	101	ug/L	100	ug/L	100.6	90.0 - 110.0	MS	12-MAR-23 12:44	230312-1
	Calcium	5050	ug/L	5000	ug/L	101.1	90.0 - 110.0	MS	12-MAR-23 12:44	230312-1
CCV02	Boron	99.5	ug/L	100	ug/L	99.5	90.0 - 110.0	MS	12-MAR-23 12:55	230312-1
	Calcium	5090	ug/L	5000	ug/L	101.7	90.0 - 110.0	MS	12-MAR-23 12:55	230312-1
CCV03	Boron	99.3	ug/L	100	ug/L	99.3	90.0 - 110.0	MS	12-MAR-23 17:17	230312-1
	Calcium	4950	ug/L	5000	ug/L	99	90.0 - 110.0	MS	12-MAR-23 17:17	230312-1
CCV04	Boron	96.8	ug/L	100	ug/L	96.8	90.0 - 110.0	MS	12-MAR-23 17:52	230312-1
	Calcium	5070	ug/L	5000	ug/L	101.3	90.0 - 110.0	MS	12-MAR-23 17:52	230312-1
CCV05	Boron	99.2	ug/L	100	ug/L	99.2	90.0 - 110.0	MS	12-MAR-23 18:13	230312-1
	Calcium	5050	ug/L	5000	ug/L	101	90.0 - 110.0	MS	12-MAR-23 18:13	230312-1

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-2b-
CRDL Standard for ICP & ICPMS

SDG No: 613711

Contract: DMNN00101

Lab Code: GEL

Instrument ID: ICPMS15

<i>Sample ID</i>	<i>Analyte</i>	<i>Result</i>	<i>Units</i>	<i>True Value</i>	<i>Units</i>	<i>% Recovery</i>	<i>Advisory Limits (%R)</i>	<i>M*</i>	<i>Analysis Date/Time</i>	<i>Run Number</i>
CRDL01	Boron	14.1	ug/L	15	ug/L	94.2	70.0 - 130.0	MS	12-MAR-23 12:34	230312-1
	Calcium	228	ug/L	200	ug/L	114	70.0 - 130.0	MS	12-MAR-23 12:34	230312-1
CRDL02	Boron	15.6	ug/L	15	ug/L	104.2	70.0 - 130.0	MS	12-MAR-23 17:06	230312-1
	Calcium	230	ug/L	200	ug/L	114.9	70.0 - 130.0	MS	12-MAR-23 17:06	230312-1
CRDL03	Boron	11.6	ug/L	15	ug/L	77.3	70.0 - 130.0	MS	12-MAR-23 18:02	230312-1
	Calcium	215	ug/L	200	ug/L	107.7	70.0 - 130.0	MS	12-MAR-23 18:02	230312-1

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

Metals
-3a-
Initial and Continuing Calibration Blank Summary

SDG No.: 613711

Contract: DMNN00101

Lab Code: GEL

<u>Sample ID</u>	<u>Analyte</u>	<u>Result ug/L</u>	<u>Acceptance</u>	<u>Conc Qual</u>	<u>MDL</u>	<u>RDL</u>	<u>Matrix</u>	<u>M*</u>	<u>Analysis Date/Time</u>	<u>Run</u>
ICB01	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	12-MAR-23 12:30	230312-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	12-MAR-23 12:30	230312-1
CCB01	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	12-MAR-23 12:48	230312-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	12-MAR-23 12:48	230312-1
CCB02	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	12-MAR-23 12:58	230312-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	12-MAR-23 12:58	230312-1
CCB03	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	12-MAR-23 17:20	230312-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	12-MAR-23 17:20	230312-1
CCB04	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	12-MAR-23 17:55	230312-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	12-MAR-23 17:55	230312-1
CCB05	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	12-MAR-23 18:16	230312-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	12-MAR-23 18:16	230312-1

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 613711
Contract: DMNN00101
Matrix: AQ

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1205341600	Calcium	30.0	ug/L	+/-50	U	MS	30.0	100
	Boron	4.00	ug/L	+/-7.5	U	MS	4.00	15.0

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS

-4-

Interference Check Sample

SDG No: 613711

Contract: DMNN00101

Lab Code: GEL

Instrument: ICPMS15

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>True Value</u>	<u>Units</u>	<u>% Recovery</u>	<u>Acceptance Window (%R)</u>	<u>Analysis Date/Time</u>	<u>Run Number</u>
ICSA01	Calcium	95400	ug/L	100000	ug/L	95.4	80.0 - 120.0	12-MAR-23 12:37	230312-1
	Boron	2.14	ug/L					12-MAR-23 12:37	230312-1
ICSAB01	Boron	20.6	ug/L	22.06	ug/L	93.1	80.0 - 120.0	12-MAR-23 12:41	230312-1
	Calcium	96600	ug/L	100000	ug/L	96.6	80.0 - 120.0	12-MAR-23 12:41	230312-1
ICSA02	Boron	0.315	ug/L					12-MAR-23 14:17	230312-1
	Calcium	95700	ug/L	100000	ug/L	95.7	80.0 - 120.0	12-MAR-23 14:17	230312-1
ICSAB02	Boron	19.1	ug/L	22.06	ug/L	86.4	80.0 - 120.0	12-MAR-23 14:20	230312-1
	Calcium	97100	ug/L	100000	ug/L	97.1	80.0 - 120.0	12-MAR-23 14:20	230312-1
ICSA03	Boron	0.164	ug/L					12-MAR-23 15:47	230312-1
	Calcium	97100	ug/L	100000	ug/L	97.1	80.0 - 120.0	12-MAR-23 15:47	230312-1
ICSAB03	Boron	19.1	ug/L	22.06	ug/L	86.4	80.0 - 120.0	12-MAR-23 15:51	230312-1
	Calcium	94300	ug/L	100000	ug/L	94.3	80.0 - 120.0	12-MAR-23 15:51	230312-1
ICSA04	Boron	2.56	ug/L					12-MAR-23 17:10	230312-1
	Calcium	96300	ug/L	100000	ug/L	96.3	80.0 - 120.0	12-MAR-23 17:10	230312-1
ICSAB04	Boron	20.5	ug/L	22.06	ug/L	92.9	80.0 - 120.0	12-MAR-23 17:13	230312-1
	Calcium	97100	ug/L	100000	ug/L	97.1	80.0 - 120.0	12-MAR-23 17:13	230312-1
ICSA05	Boron	0.357	ug/L					12-MAR-23 18:06	230312-1
	Calcium	97300	ug/L	100000	ug/L	97.4	80.0 - 120.0	12-MAR-23 18:06	230312-1
ICSAB05	Boron	19.6	ug/L	22.06	ug/L	88.8	80.0 - 120.0	12-MAR-23 18:09	230312-1

METALS

-4-

Interference Check Sample

SDG No: 613711

Contract: DMNN00101

Lab Code: GEL

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>True Value</u>	<u>Units</u>	<u>% Recovery</u>	<u>Acceptance Window (%R)</u>	<u>Analysis Date/Time</u>	<u>Run Number</u>
	Calcium	96900	ug/L	100000	ug/L	96.9	80.0 - 120.0	12-MAR-23 18:09	230312-1

METALS

-5a-

Matrix Spike Summary

SDG NO. 613711 Client ID: AS-LF-01-2023Q1S

Contract: DMNN00101 Level: Low

Matrix: GROUND WATER % Solids:

Sample ID: 613711002 Spike ID: 1205341603

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Boron	ug/L	75-125	114		9.13	B	100	105		MS
Calcium	ug/L	75-125	5600		3570		2000	102		MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

Metals
-6-
Duplicate Sample Summary

SDG No.: 613711

Lab Code: GEL

Contract: DMNN00101

Client ID: AS-LF-01-2023Q1D

Matrix: GROUND WATER

Level: Low

Sample ID: 613711002

Duplicate ID: 1205341602

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Boron	ug/L	+/-30	9.13	B	10.3	B	11.9		MS
Calcium	ug/L	+/-20%	3570		3600		.929		MS

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 613711

Contract: DMNN00101

Aqueous LCS Source: Enviromental Express

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1205341601	Boron	ug/L	100	90.4		90.4	85-115	MS
	Calcium	ug/L	2000	2110		105	85-115	MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 613711 Client ID: AS-LF-01-2023Q1L

Contract: DMNN00101

Matrix: LIQUID Level: Low

Sample ID: 613711002 Serial Dilution ID: 1205341604

<u>Analyte</u>	<u>Initial Value</u> <u>ug/L</u>	<u>C</u>	<u>Serial Value</u> <u>ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Boron	9.13	B	20	U	71.912			MS
Calcium	3570		3220		9.914			MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-13-
SAMPLE PREPARATION SUMMARY

SDG No: 613711

Method Type: MS

Contract: DMNN00101

Lab Code: GEL

<u>Sample ID</u>	<u>Client ID</u>	<u>Sample Type</u>	<u>Matrix</u>	<u>Prep Date</u>	<u>Initial Sample Size</u>	<u>Final Sample Volume</u>	<u>Percent Solids</u>
Batch Number 2396485							
1205341600	MB for batch 2396485	MB	G	10-MAR-23	50mL	50mL	
1205341601	LCS for batch 2396485	LCS	G	10-MAR-23	50mL	50mL	
1205341603	AS-LF-01-2023Q1S	MS	G	10-MAR-23	50mL	50mL	
1205341602	AS-LF-01-2023Q1D	DUP	G	10-MAR-23	50mL	50mL	
613711001	FBLK-COP-LF-23101	SAMPLE	G	10-MAR-23	50mL	50mL	
613711002	AS-LF-01-2023Q1	SAMPLE	G	10-MAR-23	50mL	50mL	
613711003	AS-LF-02-2023Q1	SAMPLE	G	10-MAR-23	50mL	50mL	

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
Dominion Energy
SDG #: 613711**

Product: Ion Chromatography

Analytical Method: EPA 300.0

Analytical Procedure: GL-GC-E-086 REV# 30

Analytical Batch: 2397050

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
613711001	FBLK-COP-LF-23101
613711002	AS-LF-01-2023Q1
613711003	AS-LF-02-2023Q1
1205342728	Method Blank (MB)
1205342729	Laboratory Control Sample (LCS)
1205342730	613515004(MW-LF-09-2023Q1-3) Sample Duplicate (DUP)
1205342731	613515004(MW-LF-09-2023Q1-3) Post Spike (PS)
1205342732	613536004(MW-33-2023Q1) Sample Duplicate (DUP)
1205342733	613536004(MW-33-2023Q1) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Miscellaneous Information

Additional Comments

All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Product: Solids, Total Dissolved

Analytical Method: SM 2540C

Analytical Procedure: GL-GC-E-001 REV# 20

Analytical Batch: 2397276

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
613711001	FBLK-COP-LF-23101
613711002	AS-LF-01-2023Q1
613711003	AS-LF-02-2023Q1
1205343128	Method Blank (MB)
1205343129	Laboratory Control Sample (LCS)
1205343130	613547002(NonSDG) Sample Duplicate (DUP)
1205343131	613643009(NonSDG) Sample Duplicate (DUP)
1205343132	613651001(NonSDG) Sample Duplicate (DUP)
1205343133	613711002(AS-LF-01-2023Q1) Sample Duplicate (DUP)
1205343134	613745007(NonSDG) Sample Duplicate (DUP)
1205343135	613851006(NonSDG) Sample Duplicate (DUP)
1205343136	613895005(NonSDG) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Total Dissolved Solids	1205343131 (Non SDG 613643009DUP)	9.61* (0%-5%)
	1205343136 (Non SDG 613895005DUP)	6.55* (0%-5%)

Miscellaneous Information

Additional Comments

Sample filtration took > 10 minutes; therefore as prescribed in the method, a reduced aliquot was used. 1205343131 (Non SDG 613643009DUP). All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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Qualifier Definition Report for

DMNN001 Dominion Energy (50149867)

Client SDG: 613711 GEL Work Order: 613711


The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Aubrey Kingsbury

Date: 22 MAR 2023

Title: Team Leader

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: FBLK-COP-LF-23101 Project: DMNN00101
Sample ID: 613711001 Client ID: DMNN001
Matrix: AQ
Collect Date: 09-MAR-23 12:28
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride	U	ND	0.0670	0.200	mg/L		1	LXA2	03/11/23	0820	2397050	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate	U	ND	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	03/13/23	1423	2397276	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
 Address : 120 Tredegar Street
 Richmond, Virginia 23219
 Contact: Kelly Hicks
 Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: AS-LF-01-2023Q1	Project: DMNN00101
Sample ID: 613711002	Client ID: DMNN001
Matrix: GW	
Collect Date: 09-MAR-23 12:20	
Receive Date: 09-MAR-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		3.66	0.0670	0.200	mg/L		1	LXA2	03/11/23	0850	2397050	1
Fluoride	J	0.0992	0.0330	0.100	mg/L		1					
Sulfate		15.0	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		11.0	2.38	10.0	mg/L			CH6	03/13/23	1423	2397276	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: March 22, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: AS-LF-02-2023Q1 Project: DMNN00101
Sample ID: 613711003 Client ID: DMNN001
Matrix: GW
Collect Date: 09-MAR-23 12:25
Receive Date: 09-MAR-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		8.05	0.0670	0.200	mg/L		1	LXA2	03/11/23	0920	2397050	1
Fluoride	J	0.0815	0.0330	0.100	mg/L		1					
Sulfate		10.3	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		12.0	2.38	10.0	mg/L			CH6	03/13/23	1423	2397276	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: March 22, 2023

Page 1 of 4

Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, Virginia

Contact: Kelly Hicks

Workorder: 613711

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	2397050										
QC1205342730	613515004	DUP									
Chloride		2.84		2.84	mg/L	0.254		(0%-20%)	LXA2	03/11/23	00:52
Fluoride	J	0.0483	J	0.0414	mg/L	15.4	^	(+/-0.100)			
Sulfate	J	0.393		0.480	mg/L	19.9	^	(+/-0.400)			
QC1205342732	613536004	DUP									
Chloride		3.97		3.96	mg/L	0.351		(0%-20%)		03/11/23	05:21
Fluoride	J	0.0523	J	0.0472	mg/L	10.3	^	(+/-0.100)			
Sulfate	J	0.390		0.556	mg/L	35.2	^	(+/-0.400)			
QC1205342729	LCS										
Chloride	5.00			4.70	mg/L			94 (90%-110%)		03/10/23	19:54
Fluoride	2.50			2.55	mg/L			102 (90%-110%)			
Sulfate	10.0			9.72	mg/L			97.2 (90%-110%)			
QC1205342728	MB										
Chloride			U	ND	mg/L					03/10/23	19:24
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1205342731	613515004	PS									
Chloride	5.00	2.84		7.99	mg/L			103 (90%-110%)		03/11/23	01:22

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QC Summary

Workorder: 613711

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	2397050										
Fluoride	2.50	J	0.0483	2.64	mg/L		104	(90%-110%)	LXA2	03/11/23	01:22
Sulfate	10.0	J	0.393	10.2	mg/L		98.5	(90%-110%)			
QC1205342733	613536004	PS									
Chloride	5.00		3.97	9.32	mg/L		107	(90%-110%)		03/11/23	05:51
Fluoride	2.50	J	0.0523	2.69	mg/L		106	(90%-110%)			
Sulfate	10.0	J	0.390	10.3	mg/L		98.9	(90%-110%)			
Solids Analysis											
Batch	2397276										
QC1205343130	613547002	DUP									
Total Dissolved Solids			334	335	mg/L	0.299		(0%-5%)	CH6	03/13/23	14:23
QC1205343131	613643009	DUP									
Total Dissolved Solids			1090	1200	mg/L	9.61 *		(0%-5%)		03/13/23	14:23
QC1205343132	613651001	DUP									
Total Dissolved Solids			364	357	mg/L	1.94		(0%-5%)		03/13/23	14:23
QC1205343133	613711002	DUP									
Total Dissolved Solids			11.0	12.0	mg/L	8.7 ^		(+/-10.0)		03/13/23	14:23
QC1205343134	613745007	DUP									
Total Dissolved Solids		U	ND	U	ND	mg/L	N/A			03/13/23	14:23
QC1205343135	613851006	DUP									
Total Dissolved Solids			29.0	28.0	mg/L	3.51 ^		(+/-10.0)		03/13/23	14:23
QC1205343136	613895005	DUP									
Total Dissolved Solids			192	205	mg/L	6.55 *		(0%-5%)		03/13/23	14:23

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QC Summary

Workorder: 613711

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch		2397276									
QC1205343129		LCS									
Total Dissolved Solids	300			300	mg/L		100	(95%-105%)	CH6	03/13/23	14:23
QC1205343128		MB									
Total Dissolved Solids			U	ND	mg/L					03/13/23	14:23

Notes:

The Qualifiers in this report are defined as follows:

- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.
- J Value is estimated
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- H Analytical holding time was exceeded
- < Result is less than value reported
- > Result is greater than value reported
- h Preparation or preservation holding time was exceeded
- R Sample results are rejected
- Z Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.
- d 5-day BOD--The 2:1 depletion requirement was not met for this sample
- ^ RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- E General Chemistry--Concentration of the target analyte exceeds the instrument calibration range
- Q One or more quality control criteria have not been met. Refer to the applicable narrative or DER.
- NI See case narrative
- R Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.
- B The target analyte was detected in the associated blank.
- e 5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes
- J See case narrative for an explanation

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QC Summary

Workorder: 613711

Page 4 of 4

<u>Parmname</u>	<u>NOM</u>	<u>Sample Qual</u>	<u>QC</u>	<u>Units</u>	<u>RPD%</u>	<u>REC%</u>	<u>Range</u>	<u>Anlst</u>	<u>Date</u>	<u>Time</u>
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N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the samples collected as part of:

**Cope Power Station Groundwater Sampling
Samples Collected between: 3/7/2023 and 3/9/2023**

This review was performed with guidance from the associated US EPA data validation guidelines and in accordance with the Quality Assurance Program Plan. These validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the US EPA, SW-846, and Standard Methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the US EPA, SW-846, and Standard Methods utilized by the laboratory. This QA review was performed on the data associated with Job Number:

613559

The findings offered in this report are based on a review of holding times and preservation, method blank results, field blank results, filter blank results, equipment blank results, tubing blank results, matrix spike/matrix spike duplicate recoveries and precision, laboratory control sample/laboratory control sample duplicate recoveries and precision, laboratory and field duplicate precision, total and dissolved results comparisons, and/or positive results between the method detection limit and quantitation limit.

The following results were qualified based on the data verification effort:

Sample	Location	Sample Type	Method	Anayte	T/D	Result	Qual	Reason Code(s)	MDL	QL	Uncertainty	Unit
MW-LF-01-2023Q1	MW-LF-01	N	EPA 200.8	Boron	T	9.44	J	RL	4.00	15.0		ug/L
MW-LF-01-2023Q1	MW-LF-01	N	EPA 200.8	Calcium	T	2320	J+	M	30.0	100		ug/L
MW-LF-01-2023Q1	MW-LF-01	N	EPA 300.0	Fluoride	N	0.0575	J	RL	0.0330	0.100		mg/L
MW-LF-01-2023Q1	MW-LF-01	N	EPA 300.0	Sulfate	N	0.196	J	RL	0.133	0.400		mg/L
MW-LF-02-2023Q1	MW-LF-02	N	EPA 200.8	Calcium	T	5080	J+	M	30.0	100		ug/L
MW-LF-03-2023Q1	MW-LF-03	N	EPA 200.8	Boron	T	8.28	J	RL	4.00	15.0		ug/L
MW-LF-03-2023Q1	MW-LF-03	N	EPA 200.8	Calcium	T	1510	J+	M	30.0	100		ug/L
MW-LF-04-2023Q1	MW-LF-04	N	EPA 200.8	Boron	T	9.09	J	RL	4.00	15.0		ug/L
MW-LF-04-2023Q1	MW-LF-04	N	EPA 200.8	Calcium	T	2070	J+	M	30.0	100		ug/L
MW-LF-05-2023Q1	MW-LF-05	N	EPA 200.8	Boron	T	11.2	J	RL	4.00	15.0		ug/L
MW-LF-05-2023Q1	MW-LF-05	N	EPA 200.8	Calcium	T	2910	J+	M	30.0	100		ug/L
MW-LF-05-2023Q1	MW-LF-05	N	EPA 300.0	Fluoride	N	0.0696	J	RL	0.0330	0.100		mg/L
MW-LF-06-2023Q1	MW-LF-06	N	EPA 200.8	Boron	T	9.52	J	RL	4.00	15.0		ug/L
MW-LF-06-2023Q1	MW-LF-06	N	EPA 200.8	Calcium	T	2190	J+	M	30.0	100		ug/L
MW-LF-06-2023Q1	MW-LF-06	N	EPA 300.0	Fluoride	N	0.0362	J	RL	0.0330	0.100		mg/L
MW-LF-06-2023Q1	MW-LF-06	N	SM 2540C	Total Dissolved Solids	N	9.00	J	RL	2.38	10.0		mg/L
MW-BG-06-2023Q1	MW-06	N	EPA 200.8	Boron	T	8.89	J	RL	4.00	15.0		ug/L
MW-BG-06-2023Q1	MW-06	N	EPA 200.8	Calcium	T	9510	J+	M	30.0	100		ug/L
MW-BG-06-2023Q1	MW-06	N	EPA 300.0	Fluoride	N	0.0806	J	RL	0.0330	0.100		mg/L
MW-BG-06-2023Q1	MW-06	N	EPA 300.0	Sulfate	N	0.239	J	RL	0.133	0.400		mg/L
MW-BG-16-2023Q1	MW-BG-16	N	EPA 200.8	Boron	T	8.72	J	RL	4.00	15.0		ug/L
MW-BG-16-2023Q1	MW-BG-16	N	EPA 200.8	Calcium	T	2480	J+	M	30.0	100		ug/L
MW-40-2023Q1	MW-40	N	EPA 200.8	Calcium	T	37000	J+	M	30.0	100		ug/L
MW-40-2023Q1	MW-40	N	EPA 300.0	Fluoride	N	0.886	J	FD	0.0330	0.100		mg/L
DU-COP-LF-23101_03082023	MW-40	FD	EPA 200.8	Calcium	T	35900	J+	M	30.0	100		ug/L
DU-COP-LF-23101_03082023	MW-40	FD	EPA 300.0	Fluoride	N	1.09	J	FD	0.0330	0.100		mg/L

Data Qualifiers

U	The analyte was not detected above the level of the sample reporting limit.
J	Quantitation is approximate due to limitations identified during data validation.
J+	The result is an estimated quantity; the result may be biased high.
J-	The result is an estimated quantity; the result may be biased low.
UJ	The analyte was not detected; the reporting limit is approximate and may be inaccurate or imprecise.
R	Unreliable positive result; analyte may or may not be present in sample.
Reason Codes and Explanations	
BE	Equipment blank contamination.
BF	Field blank contamination.
BL	Laboratory blank contamination.
BN	Negative laboratory blank contamination.
FD	Field duplicate imprecision.
FG	Total versus Dissolved Imprecision.
H	Holding time exceeded.
L	LCS and LCSD recoveries outside of acceptance limits
LD	Laboratory duplicate imprecision.
LP	LCS/LCSD imprecision.
M	MS and MSD recoveries outside of acceptance limits
MP	MS/MSD imprecision.
Q	Chemical Preservation issue.
RL	Reported Results between the MDL and QL.
S	Radium-226+228 flagged due to reporting protocol for combined results
T	Temperature preservation issue.
X	Percent solids < 50%.
Y	Chemical yield outside of acceptance limits
ZZ	Other

Lab Sample ID	613559001
Sys Sample Code	MW-LF-01-2023Q1
Sample Name	MW-LF-01-2023Q1
Sample Date	3/7/2023 4:35:00 PM
Location	COP-MW-LF-01 / MW-LF-01
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	9.44	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	2320	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	7.97				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0575	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.196	J	RL		0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Lab Sample ID	613559002
Sys Sample Code	MW-LF-02-2023Q1
Sample Name	MW-LF-02-2023Q1
Sample Date	3/7/2023 4:40:00 PM
Location	COP-MW-LF-02 / MW-LF-02
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	16.7				4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	5080	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Fluoride	16984-48-8	N	mg/L	0.224				0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	8.32				0.133	0.133	0.400	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	27.7				0.335	0.335	1.00	Y	Yes	5	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	46.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613559003
Sys Sample Code	MW-LF-03-2023Q1
Sample Name	MW-LF-03-2023Q1
Sample Date	3/7/2023 3:50:00 PM
Location	COP-MW-LF-03 / MW-LF-03
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	8.28	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	1510	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	3.18				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.613				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Lab Sample ID	613559004
Sys Sample Code	MW-LF-04-2023Q1
Sample Name	MW-LF-04-2023Q1
Sample Date	3/7/2023 3:35:00 PM
Location	COP-MW-LF-04 / MW-LF-04
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	9.09	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	2070	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	4.72				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	2.46				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	17.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613559005
Sys Sample Code	MW-LF-05-2023Q1
Sample Name	MW-LF-05-2023Q1
Sample Date	3/7/2023 2:45:00 PM
Location	COP-MW-LF-05 / MW-LF-05
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	11.2	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	2910	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	9.28				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0696	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.489				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	12.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613559006
Sys Sample Code	MW-LF-06-2023Q1
Sample Name	MW-LF-06-2023Q1
Sample Date	3/7/2023 3:07:00 PM
Location	COP-MW-LF-06 / MW-LF-06
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	9.52	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	2190	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	8.77				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0362	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.596				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	9.00	J	RL		2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613559007
Sys Sample Code	MW-BG-06-2023Q1
Sample Name	MW-BG-06-2023Q1
Sample Date	3/8/2023 2:32:00 PM
Location	COP-MW-06 / MW-06
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	8.89	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	9510	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Fluoride	16984-48-8	N	mg/L	0.0806	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.239	J	RL		0.133	0.133	0.400	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	17.8				0.335	0.335	1.00	Y	Yes	5	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	65.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613559008
Sys Sample Code	MW-BG-16-2023Q1
Sample Name	MW-BG-16-2023Q1
Sample Date	3/8/2023 1:35:00 PM
Location	COP-MW-BG-16 / MW-BG-16
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	8.72	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	2480	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	5.20				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	1.87				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	20.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613559009
Sys Sample Code	MW-40-2023Q1
Sample Name	MW-40-2023Q1
Sample Date	3/8/2023 2:15:00 PM
Location	COP-MW-40 / MW-40
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	41.8				4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	37000	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Fluoride	16984-48-8	N	mg/L	0.886	J	FD		0.0330	0.0330	0.100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	43.6				1.34	1.34	4.00	Y	Yes	20	NA
	Sulfate	14808-79-8	N	mg/L	169				2.66	2.66	8.00	Y	Yes	20	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	287				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613559010
Sys Sample Code	DU-COP-LF-23101_03082023
Sample Name	DU-COP-LF-23101
Sample Date	3/8/2023 12:00:00 PM
Location	COP-MW-40 / MW-40
Sample Type	FD
Matrix	GW
Parent Sample	MW-40-2023Q1

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	38.2				4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	35900	J+	M		30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Fluoride	16984-48-8	N	mg/L	1.09	J	FD		0.0330	0.0330	0.100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	43.5				1.34	1.34	4.00	Y	Yes	20	NA
	Sulfate	14808-79-8	N	mg/L	177				2.66	2.66	8.00	Y	Yes	20	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	294				2.38	2.38	10.0	Y	Yes	1	NA

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the samples collected as part of:

**Cope Power Station Groundwater Sampling
Samples Collected between: 3/7/2023 and 3/9/2023**

This review was performed with guidance from the associated US EPA data validation guidelines and in accordance with the Quality Assurance Program Plan. These validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the US EPA, SW-846, and Standard Methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the US EPA, SW-846, and Standard Methods utilized by the laboratory. This QA review was performed on the data associated with Job Number:

613711

The findings offered in this report are based on a review of holding times and preservation, method blank results, field blank results, filter blank results, equipment blank results, tubing blank results, matrix spike/matrix spike duplicate recoveries and precision, laboratory control sample/laboratory control sample duplicate recoveries and precision, laboratory and field duplicate precision, total and dissolved results comparisons, and/or positive results between the method detection limit and quantitation limit.

The following results were qualified based on the data verification effort:

Sample	Location	Sample Type	Method	Analyte	T/D	Result	Qual	Reason Code(s)	MDL	QL	Uncertainty	Unit
AS-LF-01-2023Q1-3	MW-AS-01	N	EPA 200.8	Boron	T	9.13	J	RL	4.00	15.0		ug/L
AS-LF-01-2023Q1-3	MW-AS-01	N	EPA 300.0	Fluoride	N	0.0992	J	RL	0.0330	0.100		mg/L
AS-LF-02-2023Q1-3	MW-AS-02	N	EPA 200.8	Boron	T	12.2	J	RL	4.00	15.0		ug/L
AS-LF-02-2023Q1-3	MW-AS-02	N	EPA 300.0	Fluoride	N	0.0815	J	RL	0.0330	0.100		mg/L

Data Qualifiers

U	The analyte was not detected above the level of the sample reporting limit.
J	Quantitation is approximate due to limitations identified during data validation.
J+	The result is an estimated quantity; the result may be biased high.
J-	The result is an estimated quantity; the result may be biased low.
UJ	The analyte was not detected; the reporting limit is approximate and may be inaccurate or imprecise.
R	Unreliable positive result; analyte may or may not be present in sample.

Reason Codes and Explanations

BE	Equipment blank contamination.
BF	Field blank contamination.
BL	Laboratory blank contamination.
BN	Negative laboratory blank contamination.
FD	Field duplicate imprecision.
FG	Total versus Dissolved Imprecision.
H	Holding time exceeded.
L	LCS and LCSD recoveries outside of acceptance limits
LD	Laboratory duplicate imprecision.
LP	LCS/LCSD imprecision.
M	MS and MSD recoveries outside of acceptance limits
MP	MS/MSD imprecision.
Q	Chemical Preservation issue.

RL	Reported Results between the MDL and QL.
S	Radium-226+228 flagged due to reporting protocol for combined results
T	Temperature preservation issue.
X	Percent solids < 50%.
Y	Chemical yield outside of acceptance limits
ZZ	Other

Lab Sample ID	613711001
Sys Sample Code	FBLK-COP-LF-23101
Sample Name	FBLK-COP-LF-23101
Sample Date	3/9/2023 12:28:00 PM
Location	COP-FB / Field Blank
Sample Type	FB
Matrix	AQ
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L		U			4.00	4.00	15.0	N	Yes	1	NA
	Calcium	7440-70-2	T	ug/L		U			30.0	30.0	100	N	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L		U			0.0670	0.0670	0.200	N	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L		U			0.133	0.133	0.400	N	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Lab Sample ID	613711002
Sys Sample Code	AS-LF-01-2023Q1-3
Sample Name	AS-LF-01-2023Q1
Sample Date	3/9/2023 12:20:00 PM
Location	COP-MW-AS-01 / MW-AS-01
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	9.13	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	3570				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	3.66				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0992	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	15.0				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	11.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	613711003
Sys Sample Code	AS-LF-02-2023Q1-3
Sample Name	AS-LF-02-2023Q1
Sample Date	3/9/2023 12:25:00 PM
Location	COP-MW-AS-02 / MW-AS-02
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	12.2	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	3280				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	8.05				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0815	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	10.3				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	12.0				2.38	2.38	10.0	Y	Yes	1	NA

Appendix D
Second Semiannual Detection Monitoring
Program Event Field Data Sheets, Laboratory
Reports, and Data Validation Forms

Dominion Groundwater Level Measurement Log For Cope Generating Station

Program: CCR	Project Number: 416559.7.0
Date: 2023-10-02	Sampler Name(s): Jason Yonts
Notes:	

Well ID	Time	Depth to GW (btoc, ft)	Depth to Bottom (btoc, ft)	Notes
COP-AS-LF-01	11:17	9.32	22.45	
COP-AS-LF-02	11:20	9.14	22.67	
COP-MW-LF-01	11:22	8.24	17.96	
COP-PZ-19	11:26	7.82		
COP-MW-LF-10	11:29	14.47		
COP-MW-LF-09	11:31	15.72	33.28	
COP-MW-13	11:36	16.10		
COP-PZ-22	11:42	7.88		
COP-MW-BG-16	11:48	11.56		
COP-MW-BG-06	11:52	15.75		
COP-MW-33	12:16	16.69		
COP-MW-LF-06	12:19	19.82		
COP-MW-LF-05	12:23	20.53		
COP-MW-LF-04	12:24	23.47	31.26	
COP-MW-LF-03	12:25	23.00	31.43	
COP-MW-31	12:27	11.52		
COP-MW-LF-02	12:28	24.33		
COP-MW-32	12:32	16.86		
COP-MW-41	12:34	15.92		
COP-MW-18	12:36	17.09		
COP-PZ-24	13:26	12.14		
COP-PZ-25	13:28	10.36		
COP-MW-40	13:34	9.74	28.12	
COP-MW-LF-07	15:02	20.07	40.61	
COP-MW-LF-08	15:58	21.60	38.44	

WATER SAMPLE LOG: AS-LF-01-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Sam Thorsland DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-AS-01		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 9.28	TOTAL DEPTH TO WATER (FT): 22.45	TOTAL WATER COLUMN (FT): 13.17
TOP OF SCREEN (FT): 10	BOTTOM OF SCREEN (FT): 20	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 15:17	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 17

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 17
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
15:20	190	4.43	46.43	210.1	4.31	1.74	25.93	9.41	
15:35	190	4.42	48.83	228.8	4.4	0.65	25.24	9.42	
15:40	190	4.42	44.06	231.3	4.4	0.85	25.16	9.42	
15:45	190	4.41	44.35	234.2	4.37	0.73	25.24	9.42	
15:50	190	4.42	44.7	236.7	4.35	0.9	25.23	9.42	

SAMPLE	
TIME: 15:50	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 6270	TIME POST SAMPLE: 16:02
WATER LEVEL POST-SAMPLE: 9.42	FLOW RATE POST-SAMPLE (ML/MIN): 190
TURBIDITY POST-SAMPLE (NTU): 0.53	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK	FBLK-COP-LF-23401	16:00	FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		NO

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
0130801H	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: AS-LF-02-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Sam Thorsland DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-AS-02		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 9.09	TOTAL DEPTH TO WATER (FT): 22.67	TOTAL WATER COLUMN (FT): 13.58
TOP OF SCREEN (FT): 12.67	BOTTOM OF SCREEN (FT): 22.67	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 16:07	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 18

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 18
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
16:10	200	4.39	69.92	235.4	3.11	1.3	25.53	9.16	
16:25	200	4.4	71.99	225.7	3.17	0.66	24.21	9.17	
16:30	200	4.38	72.03	224.7	3.21	0.72	24.38	9.17	
16:35	200	4.39	72.54	223.9	3.21	0.96	24.34	9.17	
16:40	200	4.41	73.14	223.5	3.22	0.57	24.28	9.17	

SAMPLE	
TIME: 16:40	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 6600	TIME POST SAMPLE: 16:47
WATER LEVEL POST-SAMPLE: 9.17	FLOW RATE POST-SAMPLE (ML/MIN): 200
TURBIDITY POST-SAMPLE (NTU): 0.64	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		NO

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
0130801H	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: MW-LF-01-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Sam Thorsland DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-LF-01		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 8.22	TOTAL DEPTH TO WATER (FT): 17.96	TOTAL WATER COLUMN (FT): 9.74
TOP OF SCREEN (FT): 7.96	BOTTOM OF SCREEN (FT): 17.96	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 16:53	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 13

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 13
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
17:00	200	4.29	76.08	240	1.5	0.63	26.88	8.29	
17:15	200	4.32	70	248	1.28	0.63	26.88	8.36	
17:20	200	4.32	67.52	251.2	1.34	0.83	26.88	8.36	
17:25	200	4.32	67.15	254.1	1.34	0.63	26.98	8.36	
17:30	200	4.34	66.53	256.8	1.35	0.37	27.2	8.36	

SAMPLE	
TIME: 17:30	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 7400	TIME POST SAMPLE: 17:40
WATER LEVEL POST-SAMPLE: 8.36	FLOW RATE POST-SAMPLE (ML/MIN): 200
TURBIDITY POST-SAMPLE (NTU): 0.27	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		NO

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
0130801H	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: MW-LF-03-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Jason Yonts DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-LF-03		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 22.97	TOTAL DEPTH TO WATER (FT): 31.43	TOTAL WATER COLUMN (FT): 8.46
TOP OF SCREEN (FT): 18	BOTTOM OF SCREEN (FT): 28	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 17:40	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 25

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 25
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
17:46	150	4.61	37.63	127.1	2.92	1.89	26.96	23.21	
17:51	150	4.62	38.41	130.4	2.75	1.38	25.55	23.4	
17:56	125	4.63	38.48	134.2	2.69	0.383	25.59	23.51	
18:01	100	4.64	38.43	135.1	2.72	0.25	25.78	23.59	
18:06	100	4.64	38.48	133.1	2.74	0.31	25.96	23.67	
18:11	100	4.64	38.42	134.8	2.72	0.16	26.01	23.72	

SAMPLE	
TIME: 18:11	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 3100	TIME POST SAMPLE: 18:19
WATER LEVEL POST-SAMPLE: 23.86	FLOW RATE POST-SAMPLE (ML/MIN): 100
TURBIDITY POST-SAMPLE (NTU): 0.24	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		NO

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: MW-LF-04-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Jason Yonts DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-LF-04		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 23.35	TOTAL DEPTH TO WATER (FT): 31.26	TOTAL WATER COLUMN (FT): 7.91
TOP OF SCREEN (FT): 18	BOTTOM OF SCREEN (FT): 28	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 16:57	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 26

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 26
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
17:11	200	4.63	42.16	129.4	5.35	8.51	25.48	23.41	
17:16	200	4.6	42.36	130.6	5.65	4.59	25.51	23.41	
17:01	150	4.61	44.13	123.1	4.26	85.3	28.45	23.39	
17:06	150	4.6	44.78	128.2	4.93	32.8	25.78	23.38	
17:21	200	4.62	42.26	132.1	5.28	3.81	25.31	23.41	
17:26	200	4.62	42.13	132.2	5.39	2.64	25.32	23.41	

SAMPLE	
TIME: 17:26	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 5800	TIME POST SAMPLE: 17:33
WATER LEVEL POST-SAMPLE: 23.41	FLOW RATE POST-SAMPLE (ML/MIN): 200
TURBIDITY POST-SAMPLE (NTU): 1.96	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		NO

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: MW-LF-07-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Jason Yonts DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-LF-07		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 20.07	TOTAL DEPTH TO WATER (FT): 40.61	TOTAL WATER COLUMN (FT): 20.54
TOP OF SCREEN (FT): 30.2	BOTTOM OF SCREEN (FT): 40.2	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 15:03	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 35

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 35
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
15:06	200	6.03	128.14	142.4	4.85	1.71	28.96	20.19	
15:11	150	6.53	145.09	122.8	2.35	0.61	26.42	20.18	
15:16	150	6.52	141.74	115.9	2.18	0.54	26.42	20.18	
15:21	150	6.53	140.03	112.1	2.14	0.67	26.36	20.18	
15:26	150	6.53	139.11	109.2	2.07	0.27	26.44	20.19	
15:31	150	6.52	139.15	108	2.07	0.21	26.31	20.19	
15:36	150	6.52	138.94	107.9	2.05	0.25	26.33	20.18	

SAMPLE	
TIME: 15:36	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 4950	TIME POST SAMPLE: 15:46
WATER LEVEL POST-SAMPLE: 20.18	FLOW RATE POST-SAMPLE (ML/MIN): 150
TURBIDITY POST-SAMPLE (NTU): 0.15	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE	DU-COP-LF-23401	15:36
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD	NO	

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: MW-LF-08-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Jason Yonts DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-LF-08		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 21.6	TOTAL DEPTH TO WATER (FT): 38.44	TOTAL WATER COLUMN (FT): 16.84
TOP OF SCREEN (FT): 27.9	BOTTOM OF SCREEN (FT): 37.9	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 15:58	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 33

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 33
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
16:11	200	6.05	95.23	89.5	4.26	10.9	25.25	21.63	
16:16	200	5.93	88.28	94.8	5.09	4.51	25.07	21.63	
16:21	200	5.33	73.34	114.3	5.45	1.01	25.52	20.63	
16:26	200	5.21	72.05	118.1	5.45	0.95	25.64	20.63	
16:31	200	5.03	69.17	124.3	5.46	1.94	25.41	20.63	
16:36	200	5.01	68.82	124.9	5.41	1.85	25.43	20.63	
16:41	200	5	68.35	125.7	5.34	1.12	25.41	20.63	
16:01	200	6.2	104.65	88.1	3.02	152	27.75	21.63	
16:06	200	6.14	101.57	84.9	2.97	13.6	25.91	21.64	

SAMPLE	
TIME: 16:50	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 10400	TIME POST SAMPLE: 16:50
WATER LEVEL POST-SAMPLE: 20.63	FLOW RATE POST-SAMPLE (ML/MIN): 200
TURBIDITY POST-SAMPLE (NTU): 0.21	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		NO

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: MW-LF-09-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Jason Yonts DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-LF-09		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 15.69	TOTAL DEPTH TO WATER (FT): 33.28	TOTAL WATER COLUMN (FT): 17.59
TOP OF SCREEN (FT): 19.85	BOTTOM OF SCREEN (FT): 29.85	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 13:54	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 25

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 25
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
14:16	250	4.68	27.99	233.3	7.42	0.24	23.16	15.69	
14:21	250	4.71	26.71	232	7.36	0.18	23.25	15.69	
14:26	250	4.72	26.38	228.8	7.37	0.21	23.2	15.69	
14:31	250	4.73	26.14	226.7	7.29	0.27	23.36	15.69	
14:36	250	4.74	26.22	225	7.29	0.15	23.34	15.69	

SAMPLE	
TIME: 14:36	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 10500	TIME POST SAMPLE: 14:45
WATER LEVEL POST-SAMPLE: 15.69	FLOW RATE POST-SAMPLE (ML/MIN): 250
TURBIDITY POST-SAMPLE (NTU): 0	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		YES

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED

WATER SAMPLE LOG: MW-40-2023Q4

COPE GENERATING STATION

PREPARED BY	CHECKED BY
BY: Sam Thorsland DATE: 2023-10-02	BY: David Szynal DATE: 2023-10-09

WELL ID: COP-MW-40		
TASK CODE: COP-GW-2023-10	WELL TYPE: Monitoring Well	WELL DIAMETER (IN.): 2
INITIAL DEPTH TO WATER (FT): 9.72	TOTAL DEPTH TO WATER (FT): 28.12	TOTAL WATER COLUMN (FT): 18.4
TOP OF SCREEN (FT): 18.12	BOTTOM OF SCREEN (FT): 28.12	METHOD OF PURGING: Low Flow
PUMP TYPE: Peristaltic	PUMP START TIME: 14:23	PUMP INTAKE DEPTH/SAMPLE DEPTH (FT): 23

PURGING	
METHOD: Low Flow	MEASURE POINT: Top of Casing
PUMP TYPE: Peristaltic	PUMP INTAKE/SAMPLE DEPTH (FT) : 23
PURGE AND STABILIZATION NOTES:	

PURGE MEASURES									
TIME	PURGE RATE (ML/MIN)	PH (SU)	CONDUCTIVITY (US/CM)	ORP (MV)	DO (MG/L)	TURBIDITY (NTU)	TEMPERATURE (C)	WATER LEVEL	COMMENTS
14:25	150	3.92	561.03	146.5	0.4	7.84	24.7	9.75	
14:40	150	3.96	542.12	191.3	0.18	0.72	24.31	9.75	
14:45	150	3.96	519.25	197.9	0.17	0.63	24.31	9.75	
14:50	150	3.94	504	204.1	0.16	0.86	24.15	9.75	
14:55	150	3.95	496.03	207.1	0.16	0.75	24.15	9.75	
14:58	150	3.95	490.07	209.7	0.16	0.16	24.2	9.75	

SAMPLE	
TIME: 14:58	METHOD OF SAMPLING: Low Flow
TOTAL VOL. PURGED (ML): 5250	TIME POST SAMPLE: 15:12
WATER LEVEL POST-SAMPLE: 9.75	FLOW RATE POST-SAMPLE (ML/MIN): 150
TURBIDITY POST-SAMPLE (NTU): 0.47	COLOR POST SAMPLE: Clear
ODOR POST-SAMPLE: None	STABILITY REACHED: Y
SAMPLE COMMENTS:	

SAMPLE QA					
TYPE	ID	TIME	TYPE	ID	TIME
FIELD BLANK			FIELD DUPLICATE		
EQUIPMENT BLANK			FILTER BLANK		
EQUIPMENT BLANK			FILTER BLANK LOT:		
TUBING BLANK LOT:			MS/MSD		NO

BOTTLES				
BOTTLE LOT NUMBER	BOTTLE COUNT	SIZE (ML)	TYPE	PRESERVATIVE
0130801H	1	250	HDPE	HNO3
	1	250	HDPE	UNPRESERVED
	1	125	HDPE	UNPRESERVED



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: Aqua Troll 400	SAMPLER: JY 151
PROJECT NO.: 416559.0007.0000.2.2	SERIAL #: 850978	DATE: 10/2/23

PH CALIBRATION CHECK

pH 7 (LOT #): 22290139 (EXP. DATE): 04/2024	pH 4 / 10 (LOT #): 22110130 (EXP. DATE): 04/2024	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
6.62 / 7.00	9.65 / 10.0	<input checked="" type="checkbox"/> WITHIN RANGE	1358
7.00 / 7.00	10.01 / 10.0	<input checked="" type="checkbox"/> WITHIN RANGE	1400
	4.55 / 4.00	<input type="checkbox"/> WITHIN RANGE	1403
	3.99 / 4.00	<input checked="" type="checkbox"/> WITHIN RANGE	1406

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): Autocal (EXP. DATE): Autocal	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
44302 / 4490	23.37	<input type="checkbox"/> WITHIN RANGE	1406
44900 / 4490	23.42	<input checked="" type="checkbox"/> WITHIN RANGE	1407
		<input type="checkbox"/> WITHIN RANGE	
		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 24002258 (EXP. DATE): 06/2024	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
231.0 / 228	23.83	<input type="checkbox"/> WITHIN RANGE	1408
228.0 / 228	23.89	<input checked="" type="checkbox"/> WITHIN RANGE	1409
		<input type="checkbox"/> WITHIN RANGE	
		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
Baro: 762.07 mmHg	<input checked="" type="checkbox"/> WITHIN RANGE	1355
Temp: 23.48 °C	<input checked="" type="checkbox"/> WITHIN RANGE	1355
Act: 8.52 mg/L	<input checked="" type="checkbox"/> WITHIN RANGE	1355
Calc: 8.50 mg/L	<input checked="" type="checkbox"/> WITHIN RANGE	1355

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): n/a (EXP. DATE): n/a	(LOT #): n/a (EXP. DATE): n/a		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
0.03 / 0.00	0.01 / 0.00	<input checked="" type="checkbox"/> WITHIN RANGE	1412
0.92 / 1.00	1.04 / 1.00	<input checked="" type="checkbox"/> WITHIN RANGE	1413
8.97 / 10.0	10.07 / 10.0	<input checked="" type="checkbox"/> WITHIN RANGE	1414
		<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION	<input type="checkbox"/> STANDARD SOLUTION (S)
(LOT #): 24000044	LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
(EXP. DATE): 05/2024	
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input type="checkbox"/> ORP	ORP: +/- 25 mV
<input type="checkbox"/> D.O.	D.O.: VARIES
<input type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER

NOTES

PROBLEMS ENCOUNTERED

None

CORRECTIVE ACTIONS

None

SIGNED: Summit Thurland DATE: 10/2/23

CHECKED BY: [Signature] DATE: 10/9/23



WATER QUALITY METER CALIBRATION LOG

PROJECT NAME: Dominion - Cope Station	MODEL: Aqua TROLL 400	SAMPLER: JY ST
PROJECT NO.: 416559.0007.0000.2.2	SERIAL #: 851425	DATE: 10/2/23

PH CALIBRATION CHECK

pH 7 (LOT #): 22290139 (EXP. DATE): 04/2024	pH 4 / 10 (LOT #): 22110130 (EXP. DATE): 04/2024	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD	PRE-CAL. READING / STANDARD		
7.01 / 7.00		<input checked="" type="checkbox"/> WITHIN RANGE	1401
9.96 / 10.00		<input checked="" type="checkbox"/> WITHIN RANGE	1403
4.05 / 4.00		<input checked="" type="checkbox"/> WITHIN RANGE	1405
		<input type="checkbox"/> WITHIN RANGE	

SPECIFIC CONDUCTIVITY CALIBRATION CHECK

CAL. READING (LOT #): Autocal (EXP. DATE): Autocal	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
4480.7 / 4.47	22.84	<input checked="" type="checkbox"/> WITHIN RANGE	1407
		<input type="checkbox"/> WITHIN RANGE	
		<input type="checkbox"/> WITHIN RANGE	
		<input type="checkbox"/> WITHIN RANGE	

ORP CALIBRATION CHECK

CAL. READING (LOT #): 24002258 (EXP. DATE): 06/2024	TEMPERATURE (°CELSIUS)	CAL. RANGE	TIME
PRE-CAL. READING / STANDARD			
231.6 / 228.0	22.95	<input type="checkbox"/> WITHIN RANGE	
228.4 / 228.0	22.96	<input checked="" type="checkbox"/> WITHIN RANGE	1409
		<input type="checkbox"/> WITHIN RANGE	
		<input type="checkbox"/> WITHIN RANGE	

D.O. CALIBRATION CHECK

CALIBRATION READING (mg/L)	CAL. RANGE	TIME
Baro: 761.98 mmHg	<input checked="" type="checkbox"/> WITHIN RANGE	1359
Temp: 22.78 °C	<input type="checkbox"/> WITHIN RANGE	
Act: 8.63 mg/L	<input type="checkbox"/> WITHIN RANGE	
Calc: 8.6 mg/L	<input type="checkbox"/> WITHIN RANGE	

TURBIDITY CALIBRATION CHECK

CALIBRATION READING (NTU)		CAL. RANGE	TIME
(LOT #): n/a (EXP. DATE): n/a	(LOT #): n/a (EXP. DATE): n/a		
PRE-CAL. READING / STANDARD	POST-CAL. READING / STANDARD		
-0.01 / 0.00		<input checked="" type="checkbox"/> WITHIN RANGE	1356
0.99 / 1.00		<input checked="" type="checkbox"/> WITHIN RANGE	1357
10.12 / 10.00		<input checked="" type="checkbox"/> WITHIN RANGE	1357
		<input type="checkbox"/> WITHIN RANGE	

COMMENTS

<input checked="" type="checkbox"/> AUTOCAL SOLUTION (LOT #): 24000044 (EXP. DATE): 05/2024	<input type="checkbox"/> STANDARD SOLUTION (S) LIST LOT NUMBERS AND EXPIRATION DATES UNDER CALIBRATION CHECK
CALIBRATED PARAMETERS	CALIBRATION RANGES ⁽¹⁾
<input checked="" type="checkbox"/> pH	pH: +/- 0.2 S.U.
<input checked="" type="checkbox"/> COND	COND: +/- 1% OF CAL. STANDARD
<input type="checkbox"/> ORP	ORP: +/- 25 mV
<input type="checkbox"/> D.O.	D.O.: VARIES
<input type="checkbox"/> TURB	TURB: +/- 5% OF CAL. STANDARD
<input type="checkbox"/> _____	⁽¹⁾ CALIBRATION RANGES ARE SPECIFIC TO THE MODEL OF THE WATER QUALITY METER
<input type="checkbox"/> _____	

NOTES

PROBLEMS ENCOUNTERED

None	None

CORRECTIVE ACTIONS

None	None

SIGNED: [Signature] 10/2/23 DATE

CHECKED BY: [Signature] 10/9/23 DATE

October 18, 2023

Kelly Hicks
Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, Virginia 23219

Re: CCR Groundwater Monitoring - Level 1 Package
Work Order: 639970

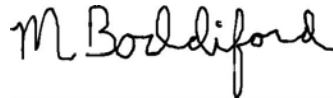
Dear Kelly Hicks:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on October 05, 2023. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Test results for NELAP or ISO 17025 accredited tests are verified to meet the requirements of those standards, with any exceptions noted. The results reported relate only to the items tested and to the sample as received by the laboratory. These results may not be reproduced except as full reports without approval by the laboratory. Copies of GEL's accreditations and certifications can be found on our website at www.gel.com.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1648.

Sincerely,



Meredith Boddiford
Project Manager

Purchase Order: 50149867
Enclosures



Table of Contents

Case Narrative.....	1
Chain of Custody and Supporting Documentation.	4
Laboratory Certifications.....	7
Metals Analysis.....	9
Case Narrative.....	10
Sample Data Summary.....	14
Quality Control Summary.....	25
General Chem Analysis.....	36
Case Narrative.....	37
Sample Data Summary.....	43
Quality Control Summary.....	54

Case Narrative

**Receipt Narrative
for
Dominion Energy (50149867)
SDG: 639970**

October 18, 2023

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on October 05, 2023 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

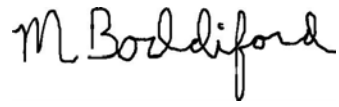
Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
639970001	MW-LF-01-2023Q4
639970002	MW-LF-03-2023Q4
639970003	MW-LF-04-2023Q4
639970004	MW-LF-07-2023Q4
639970005	MW-LF-08-2023Q4
639970006	MW-LF-09-2023Q4
639970007	AS-LF-01-2023Q4
639970008	AS-LF-02-2023Q4
639970009	DU-COP-LF-23401
639970010	FBLK-COP-LF-23401

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: General Chemistry and Metals.

A handwritten signature in black ink that reads "M Boddiford". The signature is written in a cursive style with a large, looped initial "M".

Meredith Boddiford
Project Manager

Chain of Custody and Supporting Documentation

GEL Laboratories LLC
 Chemistry | Radiochemistry | Radiobiassay | Specialty Analytics
 Chain of Custody and Analytical Request
 GEL Work Order Number: 232222
 GEL Project Manager: Meredith Boddiford
 Phone # 803-258-1528
 Fax #
 GEL Laboratories, LLC
 2040 Savage Road
 Charleston, SC 29407
 Phone: (843) 556-8171
 Fax: (843) 766-1178

Sample ID	*Date Collected (mm-dd-yy)	*Time Collected (Military) (hhmm)	QC Code (2)	Field Filtered (3)	Sample Matrix (6)	Should this sample be considered:		Total number of containers	Sample Analysis Requested (5) (Fill in the number of containers for each test)				Comments	
						Yes, please supply isotopic info.)	(7) Known or possible Hazards		TDS	Cl, FL, SO4	EPA 300.0	Total EPA 200.8		Z
MW-LF-01-2023Q4	10/2/23	1730	N	N	GW	N		3	X	X				
MW-LF-03-2023Q4	10/2/23	1811	N	N	GW	N		3	X	X				
MW-LF-04-2023Q4	10/2/23	1720	N	N	GW	N		3	X	X				
MW-LF-07-2023Q4	10/2/23	1536	N	N	GW	N		3	X	X				
MW-LF-08-2023Q4	10/2/23	1641	N	N	GW	N		3	X	X				
MW-LF-09-2023Q4	10/2/23	1456	N	N	GW	N		6	X	X				see attached work order for details
AS-LF-01-2023Q4	10/2/23	1550	N	N	GW	N		3	X	X				
AS-LF-02-2023Q4	10/2/23	1640	N	N	GW	N		3	X	X				
DULCOP-LF-23401	10/2/23	-	FD	N	GW	N		3	X	X				
FBLK-COP-LF-23401	10/2/23	1600	FB	N	AQ	N		3	X	X				

Chain of Custody Signatures

Relinquished By (Signed) _____ Date _____ Time _____
 Received by (signed) *J. Yontis* Date *10/5/23* Time *820*

2. _____
 3. _____

For sample shipping and delivery details, see Sample Receipt & Review form (SRR.)

TAT Requested: Normal: Rush: Specify: _____
 Fax Results: Yes No
 Select Deliverable: C of A QC Summary Level 1 Level 2 Level 3 Level 4
 Additional Remarks:
 For Lab Receiving Use Only: Custody Seal Intact? Yes No Cooler Temp: **3** °C
 Sample Collection Time Zone: Eastern Pacific Central Mountain Other:

1.) Chain of Custody Number = Client Determined
 2.) QC Codes: N = Normal Sample, TB = Trip Blank, FD = Field Duplicate, EB = Equipment Blank, MS = Matrix Spike Sample, MSD = Matrix Spike Duplicate Sample, G = Grab, C = Composite
 3.) Field Filtered: For liquid matrices, indicate with a - Y - for yes the sample was field filtered or - N - for sample was not field filtered.
 4.) Matrix Codes: DW - Drinking Water, GW - Groundwater, SW - Surface Water, WW - Waste Water, W - Water, ML - Misc Liquid, SO - Soil, SD - Sediment, SL - Sludge, SS - Solid Waste, O - Oil, F - Filter, P - Wipe, U - Urine, F - Fecal, N - Nasal
 5.) Sample Analysis Requested: Analytical method requested (i.e. 8250B, 6010B/7470A) and number of containers provided for each (i.e. 8260B - 3, 6010B/7470A - 1).
 6.) Preservative Type: HA = Hydrochloric Acid, NI = Nitric Acid, SH = Sodium Hydroxide, SA = Sulfuric Acid, AA = Ascorbic Acid, IIX = Hexane, ST = Sodium Thiosulfate, If no preservative is added = leave field blank

KNOWN OR POSSIBLE HAZARDS	Characteristic Hazards	Listed Waste	Other
RCRA Metals As = Arsenic Ba = Barium Cd = Cadmium Cr = Chromium Pb = Lead	FL = Flammable/Ignitable CO = Corrosive RE = Reactive TSCA Regulated PCB = Polychlorinated biphenyls	LW = Listed Waste (F, K, P and U-listed wastes.) Waste code(s):	OT = Other / Unknown (i.e.: High/low pH, asbestos, beryllium, irritants, other misc. health hazards, etc.) Description:

Please provide any additional details below regarding handling and/or disposal concerns. (i.e.: Origin of sample(s), type of site collected from, odd matrices, etc.)

SAMPLE RECEIPT & REVIEW FORM

Client: DMNN SDG/AR/COC/Work Order: 639970

Received By: QG Date Received: 10/4/23

Carrier and Tracking Number: _____
 Circle Applicable: FedEx Express, FedEx Ground, UPS, Field Services, Courier, Other

Suspected Hazard Information: Yes No *If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

A) Shipped as a DOT Hazardous? _____ Hazard/Class Shipped: _____ UN#: _____
 If UN2910, Is the Radioactive Shipment Survey Compliant? Yes ___ No ___

B) Did the client designate the samples are to be received as radioactive? _____ COC notation or radioactive stickers on containers equal client designation.

C) Did the RSO classify the samples as radioactive? _____ Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 00 CPM / mR/Hr
 Classified as: Rad 1 Rad 2 Rad 3

D) Did the client designate samples are hazardous? _____ COC notation or hazard labels on containers equal client designation.

E) Did the RSO identify possible hazards? _____ If D or E is yes, select Hazards below.
 PCB's Flammable Foreign Soil RCRA Asbestos Beryllium Other:

Sample Receipt Criteria	Yes	NA	N	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Client contacted and provided COC COC created upon receipt
3 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Preservation Method: <u>Wet Ice</u> Ice Packs Dry ice None Other: *all temperatures are recorded in Celsius TEMP: <u>3°C</u>
4 Daily check performed and passed on IR temperature gun?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Temperature Device Serial #: <u>IR1-23</u> Secondary Temperature Device Serial # (If Applicable):
5 Sample containers intact and sealed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
6 Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sample ID's and Containers Affected: If Preservation added, Lot#:
7 Do any samples require Volatile Analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If Yes, are Encores or Soil Kits present for solids? Yes ___ No ___ NA ___ (If yes, take to VOA Freezer)
				Do liquid VOA vials contain acid preservation? Yes ___ No ___ NA ___ (If unknown, select No)
				Are liquid VOA vials free of headspace? Yes ___ No ___ NA ___
8 Samples received within holding time?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and tests affected:
9 Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ID's and containers affected:
10 Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No dates on containers No times on containers COC missing info Other (describe)
11 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: No container count on COC Other (describe)
12 Are sample containers identifiable as GEL provided by use of GEL labels?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
13 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Circle Applicable: Not relinquished Other (describe)

Comments (Use Continuation Form if needed): _____

PM (or PMA) review: Initials MG Date 10/10/23 Page 1 of 1

MB

Laboratory Certifications

List of current GEL Certifications as of 18 October 2023

State	Certification
Alabama	42200
Alaska	17-018
Alaska Drinking Water	SC00012
Arkansas	88-00651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	KY90129
Kentucky Wastewater	KY90129
Louisiana Drinking Water	LA024
Louisiana NELAP	03046 (AI33904)
Maine	2023019
Maryland	270
Massachusetts	M-SC012
Massachusetts PFAS Approv	Letter
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122024-04
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	2022-160
Pennsylvania NELAP	68-00485
Puerto Rico	SC00012
S. Carolina Radiochem	10120002
Sanitation Districts of L	9255651
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-23-21
Utah NELAP	SC000122022-37
Vermont	VT87156
Virginia NELAP	460202
Washington	C780

Metals Analysis

Case Narrative

Metals
Technical Case Narrative
Dominion Energy
SDG #: 639970

Product: Determination of Metals by ICP-MS
Analytical Method: EPA 200.8 SC_NPDES
Analytical Procedure: GL-MA-E-014 REV# 36
Analytical Batch: 2504258

Preparation Method: EPA 200.2
Preparation Procedure: GL-MA-E-016 REV# 18
Preparation Batch: 2504257

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
639970001	MW-LF-01-2023Q4
639970002	MW-LF-03-2023Q4
639970003	MW-LF-04-2023Q4
639970004	MW-LF-07-2023Q4
639970005	MW-LF-08-2023Q4
639970006	MW-LF-09-2023Q4
639970007	AS-LF-01-2023Q4
639970008	AS-LF-02-2023Q4
639970009	DU-COP-LF-23401
639970010	FBLK-COP-LF-23401
1205538507	Method Blank (MB)ICP-MS
1205538508	Laboratory Control Sample (LCS)
1205538511	639970006(MW-LF-09-2023Q4L) Serial Dilution (SD)
1205538509	639970006(MW-LF-09-2023Q4D) Sample Duplicate (DUP)
1205538510	639970006(MW-LF-09-2023Q4S) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Calibration Information

ICSA/ICSAB Statement

For the ICP-MS analysis, the ICSA solution contains analyte concentrations which are verified trace impurities indigenous to the purchased standard.

Miscellaneous Information

Additional Comments

All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

DMNN001 Dominion Energy (50149867)

Client SDG: 639970 GEL Work Order: 639970

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- B Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Alan Stanley

Date: 18 OCT 2023

Title: Analyst II/Team Leader

Sample Data Summary

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970 **CONTRACT:** DMNN00101 **METHOD TYPE:** EPA

SAMPLE ID: 639970001 **LEVEL:** Low **DATE COLLECTED:** 02-OCT-23

CLIENT ID: MW-LF-01-2023Q4 **%SOLIDS:** 0 **DATE RECEIVED:** 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	10.7	ug/L	J	4.00	15.0	15.0	1	MS	PRB	10/16/23 11:52	231016-1	2504258
7440-70-2	Calcium	2450	ug/L		30.0	100	100	1	MS	PRB	10/16/23 11:52	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970 **CONTRACT:** DMNN00101 **METHOD TYPE:** EPA

SAMPLE ID: 639970002 **LEVEL:** Low **DATE COLLECTED:** 02-OCT-23
CLIENT ID: MW-LF-03-2023Q4 **%SOLIDS:** 0 **DATE RECEIVED:** 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	9.83	ug/L	J	4.00	15.0	15.0	1	MS	PRB	10/16/23 11:55	231016-1	2504258
7440-70-2	Calcium	1370	ug/L		30.0	100	100	1	MS	PRB	10/16/23 11:55	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970 **CONTRACT:** DMNN00101 **METHOD TYPE:** EPA

SAMPLE ID: 639970003 **LEVEL:** Low **DATE COLLECTED:** 02-OCT-23

CLIENT ID: MW-LF-04-2023Q4 **%SOLIDS:** 0 **DATE RECEIVED:** 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	11.6	ug/L	J	4.00	15.0	15.0	1	MS	PRB	10/16/23 11:59	231016-1	2504258
7440-70-2	Calcium	1340	ug/L		30.0	100	100	1	MS	PRB	10/16/23 11:59	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS **EPA 200.8 SC_NPDES**

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970 **CONTRACT:** DMNN00101 **METHOD TYPE:** EPA

SAMPLE ID: 639970004 **LEVEL:** Low **DATE COLLECTED:** 02-OCT-23

CLIENT ID: MW-LF-07-2023Q4 **%SOLIDS:** 0 **DATE RECEIVED:** 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	9.80	ug/L	J	4.00	15.0	15.0	1	MS	PRB	10/16/23 12:03	231016-1	2504258
7440-70-2	Calcium	21300	ug/L		30.0	100	100	1	MS	PRB	10/16/23 12:03	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970

CONTRACT: DMNN00101

METHOD TYPE:

EPA

SAMPLE ID: 639970005

LEVEL: Low

DATE COLLECTED: 02-OCT-23

CLIENT ID: MW-LF-08-2023Q4

%SOLIDS: 0

DATE RECEIVED: 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	11.0	ug/L	J	4.00	15.0	15.0	1	MS	PRB	10/16/23 12:06	231016-1	2504258
7440-70-2	Calcium	5160	ug/L		30.0	100	100	1	MS	PRB	10/16/23 12:06	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970

CONTRACT: DMNN00101

METHOD TYPE:

EPA

SAMPLE ID: 639970006

LEVEL: Low

DATE COLLECTED: 02-OCT-23

CLIENT ID: MW-LF-09-2023Q4

%SOLIDS: 0

DATE RECEIVED: 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	8.75	ug/L	J	4.00	15.0	15.0	1	MS	PRB	10/16/23 12:17	231016-1	2504258
7440-70-2	Calcium	698	ug/L		30.0	100	100	1	MS	PRB	10/16/23 12:17	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970 **CONTRACT:** DMNN00101 **METHOD TYPE:** EPA

SAMPLE ID: 639970007 **LEVEL:** Low **DATE COLLECTED:** 02-OCT-23

CLIENT ID: AS-LF-01-2023Q4 **%SOLIDS:** 0 **DATE RECEIVED:** 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	19.7	ug/L		4.00	15.0	15.0	1	MS	PRB	10/16/23 12:41	231016-1	2504258
7440-70-2	Calcium	1780	ug/L		30.0	100	100	1	MS	PRB	10/16/23 12:41	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS

-1-

INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970

CONTRACT: DMNN00101 METHOD TYPE: EPA

SAMPLE ID: 639970008

LEVEL: Low

DATE COLLECTED: 02-OCT-23

CLIENT ID: AS-LF-02-2023Q4

%SOLIDS: 0

DATE RECEIVED: 05-OCT-23

MATRIX: GW

BASIS: As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	29.2	ug/L		4.00	15.0	15.0	1	MS	PRB	10/16/23 12:45	231016-1	2504258
7440-70-2	Calcium	3830	ug/L		30.0	100	100	1	MS	PRB	10/16/23 12:45	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970 **CONTRACT:** DMNN00101 **METHOD TYPE:** EPA

SAMPLE ID: 639970009 **LEVEL:** Low **DATE COLLECTED:** 02-OCT-23
CLIENT ID: DU-COP-LF-23401 **%SOLIDS:** 0 **DATE RECEIVED:** 05-OCT-23

MATRIX: GW **BASIS:** As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	9.47	ug/L	J	4.00	15.0	15.0	1	MS	PRB	10/16/23 12:48	231016-1	2504258
7440-70-2	Calcium	21600	ug/L		30.0	100	100	1	MS	PRB	10/16/23 12:48	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS
-1-
INORGANICS ANALYSIS DATA PACKAGE

SDG No: 639970 **CONTRACT: DMNN00101** **METHOD TYPE: EPA**

SAMPLE ID: 639970010 **LEVEL:** Low **DATE COLLECTED:** 02-OCT-23
CLIENT ID: FBLK-COP-LF-23401 **%SOLIDS:** 0 **DATE RECEIVED:** 05-OCT-23

MATRIX: AQ**BASIS:** As Received

CAS	Analyte	Result	Units	Qual	MDL	PQL	CRDL	DF	M*	Analyst	Run Date	Analytical Run	Analytical Batch
7440-42-8	Boron	4.00	ug/L	U	4.00	15.0	15.0	1	MS	PRB	10/16/23 12:52	231016-1	2504258
7440-70-2	Calcium	30.0	ug/L	U	30.0	100	100	1	MS	PRB	10/16/23 12:52	231016-1	2504258

Prep Information:

Analytical Batch	Prep Batch	Prep Method	Initial wt./vol.	Units	Final wt./vol.	Units	Date	Analyst
2504258	2504257	EPA 200.2	50	mL	50	mL	10/06/23	JD2

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

Quality Control Summary

METALS

-2a-

Initial and Continuing Calibration Verification

SDG No: 639970

Contract: DMNN00101

Lab Code: GEL

Instrument ID: ICPMS15

Sample ID	Analyte	Result	Units	True Value	Units	% Recovery	Acceptance Window (%R)	M*	Analysis Date/Time	Run Number
ICV01	Boron	97.7	ug/L	100	ug/L	97.7	90.0 - 110.0	MS	16-OCT-23 11:10	231016-1
	Calcium	5090	ug/L	5000	ug/L	101.7	90.0 - 110.0	MS	16-OCT-23 11:10	231016-1
CCV01	Boron	98.6	ug/L	100	ug/L	98.6	90.0 - 110.0	MS	16-OCT-23 11:27	231016-1
	Calcium	5150	ug/L	5000	ug/L	103.1	90.0 - 110.0	MS	16-OCT-23 11:27	231016-1
CCV02	Boron	99.4	ug/L	100	ug/L	99.4	90.0 - 110.0	MS	16-OCT-23 11:38	231016-1
	Calcium	5120	ug/L	5000	ug/L	102.4	90.0 - 110.0	MS	16-OCT-23 11:38	231016-1
CCV03	Boron	98.7	ug/L	100	ug/L	98.7	90.0 - 110.0	MS	16-OCT-23 12:10	231016-1
	Calcium	5070	ug/L	5000	ug/L	101.4	90.0 - 110.0	MS	16-OCT-23 12:10	231016-1
CCV04	Boron	96	ug/L	100	ug/L	96	90.0 - 110.0	MS	16-OCT-23 12:34	231016-1
	Calcium	5110	ug/L	5000	ug/L	102.2	90.0 - 110.0	MS	16-OCT-23 12:34	231016-1
CCV05	Boron	97.2	ug/L	100	ug/L	97.2	90.0 - 110.0	MS	16-OCT-23 13:06	231016-1
	Calcium	5120	ug/L	5000	ug/L	102.4	90.0 - 110.0	MS	16-OCT-23 13:06	231016-1

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-2b-
CRDL Standard for ICP & ICPMS

SDG No: 639970

Contract: DMNN00101

Lab Code: GEL

Instrument ID: ICPMS15

<i>Sample ID</i>	<i>Analyte</i>	<i>Result</i>	<i>Units</i>	<i>True Value</i>	<i>Units</i>	<i>% Recovery</i>	<i>Advisory Limits (%R)</i>	<i>M*</i>	<i>Analysis Date/Time</i>	<i>Run Number</i>
CRDL01	Boron	15.7	ug/L	15	ug/L	104.3	70.0 - 130.0	MS	16-OCT-23 11:17	231016-1
	Calcium	231	ug/L	200	ug/L	115.5	70.0 - 130.0	MS	16-OCT-23 11:17	231016-1
CRDL02	Boron	16.6	ug/L	15	ug/L	110.7	70.0 - 130.0	MS	16-OCT-23 12:55	231016-1
	Calcium	207	ug/L	200	ug/L	103.6	70.0 - 130.0	MS	16-OCT-23 12:55	231016-1

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

Metals
-3a-
Initial and Continuing Calibration Blank Summary

SDG No.: 639970

Contract: DMNN00101

Lab Code: GEL

<u>Sample ID</u>	<u>Analyte</u>	<u>Result ug/L</u>	<u>Acceptance</u>	<u>Conc Qual</u>	<u>MDL</u>	<u>RDL</u>	<u>Matrix</u>	<u>M*</u>	<u>Analysis Date/Time</u>	<u>Run</u>
ICB01	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-OCT-23 11:13	231016-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-OCT-23 11:13	231016-1
CCB01	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-OCT-23 11:31	231016-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-OCT-23 11:31	231016-1
CCB02	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-OCT-23 11:41	231016-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-OCT-23 11:41	231016-1
CCB03	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-OCT-23 12:13	231016-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-OCT-23 12:13	231016-1
CCB04	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-OCT-23 12:38	231016-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-OCT-23 12:38	231016-1
CCB05	Boron	4.0	+/-7.5	U	4.0	15.0	LIQ	MS	16-OCT-23 13:10	231016-1
	Calcium	30.0	+/-50	U	30.0	100	LIQ	MS	16-OCT-23 13:10	231016-1

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-3b-
PREPARATION BLANK SUMMARY

SDG NO. 639970
Contract: DMNN00101
Matrix: GW

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Acceptance Window</u>	<u>Conc Qual</u>	<u>M*</u>	<u>MDL</u>	<u>RDL</u>
1205538507	Calcium	30.0	ug/L	+/-50	U	MS	30.0	100
	Boron	4.00	ug/L	+/-7.5	U	MS	4.00	15.0

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS

-4-

Interference Check Sample

SDG No: 639970

Contract: DMNN00101

Lab Code: GEL

Instrument: ICPMS15

<u>Sample ID</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>True Value</u>	<u>Units</u>	<u>% Recovery</u>	<u>Acceptance Window (%R)</u>	<u>Analysis Date/Time</u>	<u>Run Number</u>
ICSA01	Boron	3.82	ug/L					16-OCT-23 11:20	231016-1
	Calcium	94100	ug/L	100000	ug/L	94.1	80.0 - 120.0	16-OCT-23 11:20	231016-1
ICSAB01	Boron	21.8	ug/L	20	ug/L	109	80.0 - 120.0	16-OCT-23 11:24	231016-1
	Calcium	95600	ug/L	100000	ug/L	95.6	80.0 - 120.0	16-OCT-23 11:24	231016-1
ICSA02	Boron	4.59	ug/L					16-OCT-23 12:59	231016-1
	Calcium	94600	ug/L	100000	ug/L	94.6	80.0 - 120.0	16-OCT-23 12:59	231016-1
ICSAB02	Boron	22.8	ug/L	20	ug/L	114	80.0 - 120.0	16-OCT-23 13:03	231016-1
	Calcium	95400	ug/L	100000	ug/L	95.4	80.0 - 120.0	16-OCT-23 13:03	231016-1

METALS

-5a-

Matrix Spike Summary

SDG NO. 639970 Client ID: MW-LF-09-2023Q4S

Contract: DMNN00101 Level: Low

Matrix: GROUND WATER % Solids:

Sample ID: 639970006 Spike ID: 1205538510

<u>Analyte</u>	<u>Units</u>	<u>Acceptance Limit</u>	<u>Spiked Result</u>	<u>C</u>	<u>Sample Result</u>	<u>C</u>	<u>Spike Added</u>	<u>% Recovery</u>	<u>Qual</u>	<u>M*</u>
Boron	ug/L	75-125	101		8.75	B	100	92.1		MS
Calcium	ug/L	75-125	2830		698		2000	106		MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

Metals
-6-
Duplicate Sample Summary

SDG No.: 639970

Lab Code: GEL

Contract: DMNN00101

Client ID: MW-LF-09-2023Q4D

Matrix: GROUND WATER

Level: Low

Sample ID: 639970006

Duplicate ID: 1205538509

Percent Solids for Dup: N/A

Analyte	Units	Acceptance Limit	Sample Result	C	Duplicate Result	C	RPD	Qual	M*
Boron	ug/L	+/-30	8.75	B	9.47	B	7.91		MS
Calcium	ug/L	+/-20%	698		674		3.49		MS

***Analytical Methods:**

MS EPA 200.8 SC_NPDES

METALS

-7-

Laboratory Control Sample Summary

SDG NO. 639970

Contract: DMNN00101

Aqueous LCS Source: Enviromental Express

Solid LCS Source:

<u>Sample ID</u>	<u>Analyte</u>	<u>Units</u>	<u>True Value</u>	<u>Result</u>	<u>C</u>	<u>% Recovery</u>	<u>Acceptance Limit</u>	<u>M*</u>
1205538508	Boron	ug/L	100	103		103	85-115	MS
	Calcium	ug/L	2000	2150		107	85-115	MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS

-9-

Serial Dilution Sample Summary

SDG NO. 639970

Client ID: MW-LF-09-2023Q4L

Contract: DMNN00101

Matrix: LIQUID

Level: Low

Sample ID: 639970006

Serial Dilution ID: 1205538511

<u>Analyte</u>	<u>Initial Value</u> <u>ug/L</u>	<u>C</u>	<u>Serial Value</u> <u>ug/L</u>	<u>C</u>	<u>% Difference</u>	<u>Qual</u>	<u>Acceptance Limit</u>	<u>M*</u>
Boron	8.75	B	20	U	67.314			MS
Calcium	698		894		27.988			MS

*Analytical Methods:

MS EPA 200.8 SC_NPDES

METALS
-13-
SAMPLE PREPARATION SUMMARY

SDG No: 639970

Method Type: MS

Contract: DMNN00101

Lab Code: GEL

<u>Sample ID</u>	<u>Client ID</u>	<u>Sample Type</u>	<u>Matrix</u>	<u>Prep Date</u>	<u>Initial Sample Size</u>	<u>Final Sample Volume</u>	<u>Percent Solids</u>
Batch Number 2504257							
1205538507	MB for batch 2504257	MB	G	06-OCT-23	50mL	50mL	
1205538508	LCS for batch 2504257	LCS	G	06-OCT-23	50mL	50mL	
1205538510	MW-LF-09-2023Q4S	MS	G	06-OCT-23	50mL	50mL	
1205538509	MW-LF-09-2023Q4D	DUP	G	06-OCT-23	50mL	50mL	
639970001	MW-LF-01-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970002	MW-LF-03-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970003	MW-LF-04-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970004	MW-LF-07-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970005	MW-LF-08-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970006	MW-LF-09-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970007	AS-LF-01-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970008	AS-LF-02-2023Q4	SAMPLE	G	06-OCT-23	50mL	50mL	
639970009	DU-COP-LF-23401	SAMPLE	G	06-OCT-23	50mL	50mL	
639970010	FBLK-COP-LF-23401	SAMPLE	G	06-OCT-23	50mL	50mL	

EPA

General Chem Analysis

Case Narrative

**General Chemistry
Technical Case Narrative
Dominion Energy
SDG #: 639970**

Product: Ion Chromatography

Analytical Method: EPA 300.0

Analytical Procedure: GL-GC-E-086 REV# 33

Analytical Batches: 2504593 and 2504788

The following samples were analyzed using the above methods and analytical procedure(s).

<u>GEL Sample ID#</u>	<u>Client Sample Identification</u>
639970001	MW-LF-01-2023Q4
639970002	MW-LF-03-2023Q4
639970003	MW-LF-04-2023Q4
639970004	MW-LF-07-2023Q4
639970005	MW-LF-08-2023Q4
639970006	MW-LF-09-2023Q4
639970007	AS-LF-01-2023Q4
639970008	AS-LF-02-2023Q4
639970009	DU-COP-LF-23401
639970010	FBLK-COP-LF-23401
1205539079	Method Blank (MB)
1205539080	Laboratory Control Sample (LCS)
1205539088	639969003(MW-FGD-20AR-2023Q4) Sample Duplicate (DUP)
1205539090	639969003(MW-FGD-20AR-2023Q4) Post Spike (PS)
1205539354	Method Blank (MB)
1205539355	Laboratory Control Sample (LCS)
1205539356	639970006(MW-LF-09-2023Q4) Sample Duplicate (DUP)
1205539358	639970006(MW-LF-09-2023Q4) Post Spike (PS)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Matrix Spike (MS)/Post Spike (PS) Recovery Statement

The percent recoveries (%R) obtained from the spike analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. The matrix spike recovered outside of the established acceptance limits due to matrix interference and/or non-homogeneity.

Analyte	Sample	Value
Chloride	1205539090 (MW-FGD-20AR-2023Q4PS)	115* (90%-110%)

Technical Information

Sample Dilutions

The following samples 1205539088 (MW-FGD-20AR-2023Q4DUP), 1205539090 (MW-FGD-20AR-2023Q4PS) and 639970001 (MW-LF-01-2023Q4) were diluted because target analyte concentrations exceeded the calibration range. Dilutions may be required for many reasons, including to minimize matrix interferences or to bring over range target analyte concentrations into the linear calibration range.

Analyte	639970
	001
Chloride	2X

Miscellaneous Information

Manual Integrations

Sample 639970005 (MW-LF-08-2023Q4) was manually integrated to correctly position the baseline as set in the calibration standards.

Additional Comments

All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Product: Solids, Total Dissolved

Analytical Method: SM 2540C

Analytical Procedure: GL-GC-E-001 REV# 21

Analytical Batches: 2504470 and 2505308

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
639970001	MW-LF-01-2023Q4
639970002	MW-LF-03-2023Q4
639970003	MW-LF-04-2023Q4
639970004	MW-LF-07-2023Q4
639970005	MW-LF-08-2023Q4
639970006	MW-LF-09-2023Q4
639970007	AS-LF-01-2023Q4
639970008	AS-LF-02-2023Q4
639970009	DU-COP-LF-23401
639970010	FBLK-COP-LF-23401
1205538855	Method Blank (MB)
1205538856	Laboratory Control Sample (LCS)
1205538857	639837002(NonSDG) Sample Duplicate (DUP)
1205538858	639899002(NonSDG) Sample Duplicate (DUP)
1205538859	639970001(MW-LF-01-2023Q4) Sample Duplicate (DUP)
1205540297	Method Blank (MB)
1205540298	Laboratory Control Sample (LCS)
1205540299	639837009(NonSDG) Sample Duplicate (DUP)
1205540300	639848003(NonSDG) Sample Duplicate (DUP)
1205540301	639970006(MW-LF-09-2023Q4) Sample Duplicate (DUP)
1205540302	640382001(NonSDG) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Duplicate Relative Percent Difference (RPD) Statement

The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Total Dissolved Solids	1205538857 (Non SDG 639837002DUP)	6.06* (0%-5%)
	1205538858 (Non SDG 639899002DUP)	10.5* (0%-5%)
	1205540302 (Non SDG 640382001DUP)	15.9* (0%-5%)

Miscellaneous Information

Additional Comments

A TDS meter was used to check the samples for interference prior to analysis. 1205538857 (Non SDG 639837002DUP) and 1205540299 (Non SDG 639837009DUP). All method-driven specifications are followed for these analyses except where client-specific SOW requirements are required to be met.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

DMNN001 Dominion Energy (50149867)

Client SDG: 639970 GEL Work Order: 639970

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- J Value is estimated
- U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Kristen Mizzell

Date: 19 OCT 2023

Title: Group Leader

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-01-2023Q4 Project: DMNN00101
Sample ID: 639970001 Client ID: DMNN001
Matrix: GW
Collect Date: 02-OCT-23 17:30
Receive Date: 05-OCT-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Fluoride	J	0.0695	0.0330	0.100	mg/L		1	HXC1	10/07/23	0410	2504593	1
Sulfate		0.645	0.133	0.400	mg/L		1					
Chloride		12.9	0.134	0.400	mg/L		2	HXC1	10/09/23	1820	2504593	2
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	J	7.00	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-03-2023Q4 Project: DMNN00101
Sample ID: 639970002 Client ID: DMNN001
Matrix: GW
Collect Date: 02-OCT-23 18:11
Receive Date: 05-OCT-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		3.09	0.0670	0.200	mg/L		1	HXC1	10/07/23	0441	2504593	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate		0.575	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-04-2023Q4 Project: DMNN00101
Sample ID: 639970003 Client ID: DMNN001
Matrix: GW
Collect Date: 02-OCT-23 17:26
Receive Date: 05-OCT-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		3.52	0.0670	0.200	mg/L		1	LXA2	10/07/23	2320	2504788	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate		0.610	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219
Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-07-2023Q4 Project: DMNN00101
Sample ID: 639970004 Client ID: DMNN001
Matrix: GW
Collect Date: 02-OCT-23 15:36
Receive Date: 05-OCT-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		6.74	0.0670	0.200	mg/L		1	LXA2	10/07/23	2351	2504788	1
Fluoride		0.167	0.0330	0.100	mg/L		1					
Sulfate		0.986	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		63.0	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-08-2023Q4 Project: DMNN00101
Sample ID: 639970005 Client ID: DMNN001
Matrix: GW
Collect Date: 02-OCT-23 16:41
Receive Date: 05-OCT-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		9.95	0.0670	0.200	mg/L		1	LXA2	10/08/23	0022	2504788	1
Fluoride	J	0.0626	0.0330	0.100	mg/L		1					
Sulfate	J	0.224	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		21.0	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
 Address : 120 Tredegar Street
 Richmond, Virginia 23219
 Contact: Kelly Hicks
 Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: MW-LF-09-2023Q4	Project: DMNN00101
Sample ID: 639970006	Client ID: DMNN001
Matrix: GW	
Collect Date: 02-OCT-23 14:36	
Receive Date: 05-OCT-23	
Collector: Client	

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		2.74	0.0670	0.200	mg/L		1	LXA2	10/08/23	0053	2504788	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate		0.587	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	10/09/23	1310	2505308	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: AS-LF-01-2023Q4
Sample ID: 639970007
Matrix: GW
Collect Date: 02-OCT-23 15:50
Receive Date: 05-OCT-23
Collector: Client

Project: DMNN00101
Client ID: DMNN001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		2.58	0.0670	0.200	mg/L		1	LXA2	10/08/23	0225	2504788	1
Fluoride	J	0.0571	0.0330	0.100	mg/L		1					
Sulfate		8.01	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration
Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219
Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: AS-LF-02-2023Q4
Sample ID: 639970008
Matrix: GW
Collect Date: 02-OCT-23 16:40
Receive Date: 05-OCT-23
Collector: Client

Project: DMNN00101
Client ID: DMNN001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		6.63	0.0670	0.200	mg/L		1	LXA2	10/08/23	0429	2504788	1
Fluoride	J	0.0776	0.0330	0.100	mg/L		1					
Sulfate		11.5	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		19.0	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor
DL: Detection Limit
MDA: Minimum Detectable Activity
MDC: Minimum Detectable Concentration

Lc/LC: Critical Level
PF: Prep Factor
RL: Reporting Limit
SQL: Sample Quantitation Limit

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Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219
Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: DU-COP-LF-23401 Project: DMNN00101
Sample ID: 639970009 Client ID: DMNN001
Matrix: GW
Collect Date: 02-OCT-23 12:00
Receive Date: 05-OCT-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride		6.68	0.0670	0.200	mg/L		1	LXA2	10/08/23	0500	2504788	1
Fluoride		0.146	0.0330	0.100	mg/L		1					
Sulfate		1.01	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids		66.0	2.38	10.0	mg/L			CH6	10/06/23	1528	2504470	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: October 19, 2023

Company : Dominion Energy Services, Inc.
Address : 120 Tredegar Street

Richmond, Virginia 23219

Contact: Kelly Hicks
Project: CCR Groundwater Monitoring - Level 1 Package

Client Sample ID: FBLK-COP-LF-23401 Project: DMNN00101
Sample ID: 639970010 Client ID: DMNN001
Matrix: AQ
Collect Date: 02-OCT-23 16:00
Receive Date: 05-OCT-23
Collector: Client

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
EPA 300.0 Anions Liquid "As Received"												
Chloride	J	0.173	0.0670	0.200	mg/L		1	LXA2	10/08/23	0531	2504788	1
Fluoride	U	ND	0.0330	0.100	mg/L		1					
Sulfate	U	ND	0.133	0.400	mg/L		1					
Solids Analysis												
SM2540C TDS "As Received"												
Total Dissolved Solids	U	ND	2.38	10.0	mg/L			CH6	10/09/23	1310	2505308	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	SM 2540C	

Notes:

Column headers are defined as follows:

DF: Dilution Factor Lc/LC: Critical Level
DL: Detection Limit PF: Prep Factor
MDA: Minimum Detectable Activity RL: Reporting Limit
MDC: Minimum Detectable Concentration SQL: Sample Quantitation Limit

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: October 19, 2023

Page 1 of 4

Dominion Energy Services, Inc.
120 Tredegar Street
Richmond, Virginia

Contact: Kelly Hicks

Workorder: 639970

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	2504593										
QC1205539088	639969003	DUP									
Chloride		671		680	mg/L	1.4		(0%-20%)	HXC1	10/09/23	14:44
Fluoride		0.331		0.289	mg/L	13.4	^	(+/-0.100)		10/06/23	22:31
Sulfate		232		230	mg/L	1.25		(0%-20%)		10/09/23	14:44
QC1205539080	LCS										
Chloride	5.00			4.67	mg/L			93.4 (90%-110%)		10/07/23	03:09
Fluoride	2.50			2.40	mg/L			96.1 (90%-110%)			
Sulfate	10.0			9.59	mg/L			95.9 (90%-110%)			
QC1205539079	MB										
Chloride			U	ND	mg/L					10/07/23	02:38
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1205539090	639969003	PS									
Chloride	5.00	6.71		12.4	mg/L			115* (90%-110%)		10/09/23	15:15
Fluoride	2.50	0.331		2.62	mg/L			91.6 (90%-110%)		10/06/23	23:02
Sulfate	10.0	2.32		12.2	mg/L			98.5 (90%-110%)		10/09/23	15:15

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QC Summary

Workorder: 639970

Page 2 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Ion Chromatography											
Batch	2504788										
QC1205539356	639970006	DUP									
Chloride		2.74		2.68	mg/L	2.47		(0%-20%)	LXA2	10/08/23	01:24
Fluoride	U	ND	U	ND	mg/L	N/A					
Sulfate		0.587		0.458	mg/L	24.7 ^		(+/-0.400)			
QC1205539355	LCS										
Chloride	5.00			4.61	mg/L		92.1	(90%-110%)		10/07/23	15:37
Fluoride	2.50			2.38	mg/L		95.4	(90%-110%)			
Sulfate	10.0			9.49	mg/L		94.9	(90%-110%)			
QC1205539354	MB										
Chloride			U	ND	mg/L					10/07/23	15:06
Fluoride			U	ND	mg/L						
Sulfate			U	ND	mg/L						
QC1205539358	639970006	PS									
Chloride	5.00	2.74		7.91	mg/L		103	(90%-110%)		10/08/23	01:55
Fluoride	2.50	U	ND	2.50	mg/L		99.9	(90%-110%)			
Sulfate	10.0	0.587		10.2	mg/L		96.4	(90%-110%)			
Solids Analysis											
Batch	2504470										
QC1205538857	639837002	DUP									
Total Dissolved Solids		1600		1700	mg/L	6.06*		(0%-5%)	CH6	10/06/23	15:28

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QC Summary

Workorder: 639970

Page 3 of 4

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Solids Analysis											
Batch	2504470										
QC1205538858	639899002	DUP									
Total Dissolved Solids		160		144	mg/L	10.5*		(0%-5%)	CH6	10/06/23	15:28
QC1205538859	639970001	DUP									
Total Dissolved Solids	J	7.00	J	5.00	mg/L	33.3 ^		(+/-10.0)		10/06/23	15:28
QC1205538856	LCS										
Total Dissolved Solids	300			301	mg/L		100	(95%-105%)		10/06/23	15:27
QC1205538855	MB										
Total Dissolved Solids			U	ND	mg/L					10/06/23	15:27
Batch	2505308										
QC1205540299	639837009	DUP									
Total Dissolved Solids		806		798	mg/L	0.998		(0%-5%)	CH6	10/09/23	13:10
QC1205540300	639848003	DUP									
Total Dissolved Solids		310		310	mg/L	0		(0%-5%)		10/09/23	13:10
QC1205540301	639970006	DUP									
Total Dissolved Solids	U	ND	U	ND	mg/L	N/A				10/09/23	13:10
QC1205540302	640382001	DUP									
Total Dissolved Solids		163		139	mg/L	15.9*		(0%-5%)		10/09/23	13:10
QC1205540298	LCS										
Total Dissolved Solids	300			302	mg/L		101	(95%-105%)		10/09/23	13:10
QC1205540297	MB										
Total Dissolved Solids			U	ND	mg/L					10/09/23	13:10

Notes:

The Qualifiers in this report are defined as follows:

U Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Workorder: 639970

Page 4 of 4

Parname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
J											
X											
H											
<											
>											
h											
R											
Z											
d											
^											
N/A											
ND											
NJ											
E											
Q											
N1											
R											
B											
e											
J											

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

This quality assurance (QA) review is based upon an examination of the data generated from the analyses of the samples collected as part of:

**Cope Power Station Groundwater Sampling
 Samples Collected between: 10/2/2023 and 10/2/2023**

This review was performed with guidance from the associated US EPA data validation guidelines and in accordance with the Quality Assurance Program Plan. These validation guidance documents specifically address analyses performed in accordance with the Contract Laboratory Program (CLP) analytical methods and are not completely applicable to the type of analyses and analytical protocols performed for the US EPA, SW-846, and Standard Methods utilized by the laboratory for these samples. Environmental Standards, Inc. (Environmental Standards) used professional judgment to determine the usability of the analytical results and compliance relative to the US EPA, SW-846, and Standard Methods utilized by the laboratory. This QA review was performed on the data associated with Job Number:

639970

The findings offered in this report are based on a review of holding times and preservation, method blank results, field blank results, filter blank results, equipment blank results, tubing blank results, matrix spike/matrix spike duplicate recoveries and precision, laboratory control sample/laboratory control sample duplicate recoveries and precision, laboratory and field duplicate precision, total and dissolved results comparisons, and/or positive results between the method detection limit and quantitation limit.

The following results were qualified based on the data verification effort:

Sample	Location	Sample Type	Method	Analyte	T/D	Result	Qual	Reason Code(s)	MDL	QL	Uncertainty	Unit
MW-LF-01-2023Q4	MW-LF-01	N	EPA 200.8	Boron	T	10.7	J	RL	4.00	15.0		ug/L
MW-LF-01-2023Q4	MW-LF-01	N	EPA 300.0	Fluoride	N	0.0695	J	RL	0.0330	0.100		mg/L
MW-LF-01-2023Q4	MW-LF-01	N	SM 2540C	Total Dissolved Solids	N	7.00	J	RL	2.38	10.0		mg/L
MW-LF-03-2023Q4	MW-LF-03	N	EPA 200.8	Boron	T	9.83	J	RL	4.00	15.0		ug/L
MW-LF-04-2023Q4	MW-LF-04	N	EPA 200.8	Boron	T	11.6	J	RL	4.00	15.0		ug/L
MW-LF-07-2023Q4	MW-LF-07	N	EPA 200.8	Boron	T	9.80	J	RL	4.00	15.0		ug/L
MW-LF-08-2023Q4	MW-LF-08	N	EPA 200.8	Boron	T	11.0	J	RL	4.00	15.0		ug/L
MW-LF-08-2023Q4	MW-LF-08	N	EPA 300.0	Fluoride	N	0.0626	J	RL	0.0330	0.100		mg/L
MW-LF-08-2023Q4	MW-LF-08	N	EPA 300.0	Sulfate	N	0.224	J	RL	0.133	0.400		mg/L
MW-LF-09-2023Q4	MW-LF-09	N	EPA 200.8	Boron	T	8.75	J	RL	4.00	15.0		ug/L
AS-LF-01-2023Q4	MW-AS-01	N	EPA 300.0	Fluoride	N	0.0571	J	RL	0.0330	0.100		mg/L
AS-LF-02-2023Q4	MW-AS-02	N	EPA 300.0	Fluoride	N	0.0776	J	RL	0.0330	0.100		mg/L
DU-COP-LF-23401_20231002	MW-LF-07	FD	EPA 200.8	Boron	T	9.47	J	RL	4.00	15.0		ug/L
FBLK-COP-LF-23401_20231002	Field Blank	FB	EPA 300.0	Chloride	N	0.173	J	RL	0.0670	0.200		mg/L

Data Qualifiers	
U	The analyte was not detected above the level of the sample reporting limit.
J	Quantitation is approximate due to limitations identified during data validation.
J+	The result is an estimated quantity; the result may be biased high.
J-	The result is an estimated quantity; the result may be biased low.
UJ	The analyte was not detected; the reporting limit is approximate and may be inaccurate or imprecise.
R	Unreliable positive result; analyte may or may not be present in sample.
Reason Codes and Explanations	
BE	Equipment blank contamination.
BF	Field blank contamination.
BL	Laboratory blank contamination.

BN	Negative laboratory blank contamination.
FD	Field duplicate imprecision.
FG	Total versus Dissolved Imprecision.
H	Holding time exceeded.
L	LCS and LCSD recoveries outside of acceptance limits
LD	Laboratory duplicate imprecision.
LP	LCS/LCSD imprecision.
M	MS and MSD recoveries outside of acceptance limits
MP	MS/MSD imprecision.
Q	Chemical Preservation issue.
RL	Reported Results between the MDL and QL.
S	Radium-226+228 flagged due to reporting protocol for combined results
T	Temperature preservation issue.
X	Percent solids < 50%.
Y	Chemical yield outside of acceptance limits
ZZ	Other

Lab Sample ID	639970001
Sys Sample Code	MW-LF-01-2023Q4
Sample Name	MW-LF-01-2023Q4
Sample Date	10/2/2023 5:30:00 PM
Location	COP-MW-LF-01 / MW-LF-01
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	10.7	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	2450				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Fluoride	16984-48-8	N	mg/L	0.0695	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.645				0.133	0.133	0.400	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	12.9				0.134	0.134	0.400	Y	Yes	2	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	7.00	J	RL		2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	639970002
Sys Sample Code	MW-LF-03-2023Q4
Sample Name	MW-LF-03-2023Q4
Sample Date	10/2/2023 6:11:00 PM
Location	COP-MW-LF-03 / MW-LF-03
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	9.83	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	1370				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	3.09				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.575				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Lab Sample ID	639970003
Sys Sample Code	MW-LF-04-2023Q4
Sample Name	MW-LF-04-2023Q4
Sample Date	10/2/2023 5:26:00 PM
Location	COP-MW-LF-04 / MW-LF-04
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	11.6	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	1340				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	3.52				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.610				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Lab Sample ID	639970004
Sys Sample Code	MW-LF-07-2023Q4
Sample Name	MW-LF-07-2023Q4
Sample Date	10/2/2023 3:36:00 PM
Location	COP-MW-LF-07 / MW-LF-07
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	9.80	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	21300				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	6.74				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.167				0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.986				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	63.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	639970005
Sys Sample Code	MW-LF-08-2023Q4
Sample Name	MW-LF-08-2023Q4
Sample Date	10/2/2023 4:41:00 PM
Location	COP-MW-LF-08 / MW-LF-08
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	11.0	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	5160				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	9.95				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0626	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.224	J	RL		0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	21.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	639970006
Sys Sample Code	MW-LF-09-2023Q4
Sample Name	MW-LF-09-2023Q4
Sample Date	10/2/2023 2:36:00 PM
Location	COP-MW-LF-09 / MW-LF-09
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	8.75	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	698				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	2.74				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	0.587				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Lab Sample ID	639970007
Sys Sample Code	AS-LF-01-2023Q4
Sample Name	AS-LF-01-2023Q4
Sample Date	10/2/2023 3:50:00 PM
Location	COP-MW-AS-01 / MW-AS-01
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	19.7				4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	1780				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	2.58				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0571	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	8.01				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Lab Sample ID	639970008
Sys Sample Code	AS-LF-02-2023Q4
Sample Name	AS-LF-02-2023Q4
Sample Date	10/2/2023 4:40:00 PM
Location	COP-MW-AS-02 / MW-AS-02
Sample Type	N
Matrix	GW
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	29.2				4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	3830				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	6.63				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.0776	J	RL		0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	11.5				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	19.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	639970009
Sys Sample Code	DU-COP-LF-23401_20231002
Sample Name	DU-COP-LF-23401
Sample Date	10/2/2023 12:00:00 PM
Location	COP-MW-LF-07 / MW-LF-07
Sample Type	FD
Matrix	GW
Parent Sample	MW-LF-07-2023Q4

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L	9.47	J	RL		4.00	4.00	15.0	Y	Yes	1	NA
	Calcium	7440-70-2	T	ug/L	21600				30.0	30.0	100	Y	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	6.68				0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L	0.146				0.0330	0.0330	0.100	Y	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L	1.01				0.133	0.133	0.400	Y	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L	66.0				2.38	2.38	10.0	Y	Yes	1	NA

Lab Sample ID	639970010
Sys Sample Code	FBLK-COP-LF-23401_20231002
Sample Name	FBLK-COP-LF-23401
Sample Date	10/2/2023 4:00:00 PM
Location	COP-FB / Field Blank
Sample Type	FB
Matrix	AQ
Parent Sample	

Analytic Method	Chemical Name	CAS Rn	Fraction	Result Unit	Final Result	Final Qual	Reason code	Uncertainty	Final MDL	Final RL	Final QL	Final Detect	Final Report	DF	Basis
EPA 200.8	Boron	7440-42-8	T	ug/L		U			4.00	4.00	15.0	N	Yes	1	NA
	Calcium	7440-70-2	T	ug/L		U			30.0	30.0	100	N	Yes	1	NA
EPA 300.0	Chloride	16887-00-6	N	mg/L	0.173	J	RL		0.0670	0.0670	0.200	Y	Yes	1	NA
	Fluoride	16984-48-8	N	mg/L		U			0.0330	0.0330	0.100	N	Yes	1	NA
	Sulfate	14808-79-8	N	mg/L		U			0.133	0.133	0.400	N	Yes	1	NA
SM 2540C	Total Dissolved Solids	TDS	N	mg/L		U			2.38	2.38	10.0	N	Yes	1	NA

Appendix E

First Semiannual Detection Monitoring Program Statistical Evaluation



DOMINION ENERGY SOUTH CAROLINA

COPE STATION CLASS III LANDFILL

SEMIANNUAL DETECTION MONITORING

ORANGEBURG COUNTY, SOUTH CAROLINA

CCR GROUNDWATER DETECTION MONITORING STATISTICAL ANALYSIS REPORT

For the

March 2023 Sampling Event

June 16, 2023



A handwritten signature in blue ink, appearing to read "Joyce E. Peterson".

Joyce Peterson, P.E.
Senior Environmental Engineer

A handwritten signature in blue ink, appearing to read "Richard A. Mayer Jr.".

Richard A. Mayer Jr., P.G.
Project Manager

*TRC Environmental Corporation | Dominion Energy South Carolina
Cope Station Class III Landfill – Detection Monitoring*

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Table of Contents

Statistical Analysis Report.....	1
Groundwater Sampling.....	1
Statistical Analysis	1

List of Tables

Table 1	Background Threshold Values for 2023
Table 2	March 2023 Downgradient Results and Potential SSIs

List of Appendices

Appendix A	Background Data Set for March 2023 Semiannual Detection Monitoring Event
Appendix B	Probability (Q-Q) Plots
Appendix C	Two Sample Hypothesis Test Outputs
Appendix D	Background Threshold Values

Statistical Analysis Report

Groundwater Sampling

TRC Environmental Corporation (TRC) is providing this Statistically Significant Increases (SSI) notification for the Cope Station Class III Landfill for the twelfth semiannual detection monitoring event. Samples were collected on March 7th – 9th, 2023. The final laboratory analytical data packages for the event were received on March 22nd, 2023, and the data validation report was received on March 31st, 2023. This report addresses results from Detection Monitoring wells MW-LF-02, MW-LF-03, MW-LF-04, MW-LF-05, and MW-LF-06. Background wells for the Class III Landfill include MW-LF-01, MW-BG-06, MW-BG-16, AS-LF-01, AS-LF-02, and MW-40 (which is not used in background concentration calculations).

Statistical Analysis

Statistically Significant Level (SSL) exceedances above background concentrations include the following:

- MW-LF-02: chloride
- MW-LF-03: none
- MW-LF-04: none
- MW-LF-05: none
- MW-LF-06: none

An Alternative Source Demonstration (ASD) should be prepared for this potential SSI.

In general accordance with the Statistical Analysis Plan¹ for Detection Monitoring, the evaluation of potential SSIs was conducted using prediction limits to compare data from the background set of monitoring wells to the most recent results from the downgradient monitoring wells. The statistical analysis plan includes regularly updating the prediction limits. This Statistical Analysis Report bases potential SSIs on updated prediction limits as described in this report. The procedure is summarized as follows:

- Background statistics are calculated using one result per monitoring period for the five background or upgradient wells (MW-LF-01, MW-BG-06, MW-BG-16, AS-LF-01, AS-LF-02). In accordance with *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*, Unified Guidance March 2009 (EPA 530/R-09-007), Chapter 5, background will be updated after every four detection monitoring events, assuming the analytical results of the four events remain consistent with the established background distribution.

¹ *Statistical Analysis Plan, SCE&G Cope Station Class III Landfill*, OBG 2017

- The data set used for establishing background for the March 2023 detection monitoring includes the results from the baseline events conducted prior to the October 2017 initiation of detection monitoring, plus the results from the semiannual detection monitoring events between October 2017 and October 2022.

The new data to be appended to the background data sets were tested using the Wilcoxon-Mann-Whitney (WMW) two sample hypothesis test and found to be consistent with the previous data distributions except for TDS. Trend tests were conducted for these two constituents, which were found to exhibit downward trends. Because the trends are downward, the inclusion of the most recent data provides a conservative updating of the background threshold values (BTV).

- The background data sets were observed graphically for potential outlier values (probability plots (*i.e.*, Q-Q graphs); see Appendix A). Graphically apparent outliers, if any, are tested using ProUCL. The two non-detect boron results at an elevated detection limit were removed from the data set.
- ProUCL was used to calculate a BTV for each of the Appendix III parameters. For data sets with greater than 50 percent detected values, the BTV was calculated based on the distribution of the data. For data sets with 50 percent or fewer detected values, nonparametric BTVs were used. Kaplan-Meier adjustments were used for data sets with fewer than 50 percent nondetect values.
- Upper prediction limits (UPLs) were the preferred BTVs for data sets that met the requirements for parametric statistical methods. The UPLs were calculated for 5 future sampling events (five downgradient wells). If a calculated UPL is less than the practical quantitative limit (PQL), the comparison value is set at the PQL.
- Upper statistical limits (USL) were the preferred BTVs for data sets that required use of nonparametric statistical methods to account for the lower level of confidence inherent in nonparametric statistical methods. If a calculated USL is less than the PQL, the comparison value is set at the PQL.
- For background data sets with no or very few data points exceeding the quantification limit for that constituent, the double quantification rule (DQR) was used to establish a potential SSI. Based on the DQR, a downgradient well would need to have a detected concentration above the PQL for two consecutive sampling events to consider the well/constituent to have a potential SSI.
- Direct comparisons are made between the statistically derived BTVs and the downgradient monitoring results to identify potential SSIs for the March 2023 detection monitoring event.

The statistical calculations have been conducted using United States Environmental Protection Agency's (USEPA's) ProUCL (v.5.2) software. Table 1 presents the data representing background. Table 2 presents basic statistical information regarding the data sets and the calculated BTVs. Table 3 presents the data set for the twelfth detection monitoring event and highlights results that are potential SSIs. Appendix A includes ProUCL – probability plots for visual identification of potential outliers; Appendix C includes

ProUCL outputs for Wilcoxon-Mann-Whitney (WMW) two sample hypothesis tests and trend tests for constituents where the null hypothesis was rejected in the WMW test; Appendix D includes ProUCL outputs for Background Threshold Values.

Table 1
Background Threshold Values for 2023

Table 1 Background Threshold Values for 2023

CONSTITUENT	NUMBER of RESULTS	PERCENT DETECTED	DISTRIBUTION	TREND	BACKGROUND THRESHOLD VALUE	BASIS
Boron (mg/L)	73	33	Nonparametric	N/A	0.2	95% USL
Calcium (mg/L)	71 ^[1]	100	Nonparametric	N/A	15.8	95% USL
Chloride (mg/L)	73	99	Nonparametric	N/A	21.6	95% USL
Fluoride (mg/L)	73	40	Nonparametric	N/A	0.225	95% USL
pH (s.u.)	73	100	Lognormal	N/A	3.4 – 5.7	95% HW UPL (k = 5); LCL is the minimum background result
Sulfate (mg/L)	73	70	Nonparametric	N/A	21.6	95% USL
TDS (mg/L)	73	99	Gamma	Decreasing	141.3	95% HW UPL (k = 5)

[1] Outlier excluded from data set.

N/A Not Applicable – trend test conducted only for data sets where the null hypothesis for the WMW test was rejected.

Table 2

March 2023 Downgradient Results and Potential SSIs

Table 2 March 2023 Downgradient Results and Potential SSIs

WELL	CONSTITUENT / BTV / RESULT (mg/L except as noted) ^[1]						
	BORON	CALCIUM	CHLORIDE	FLUORIDE	pH	SULFATE	TDS
	0.2	15.8	21.9	0.225	3.4 – 5.8	21.6	141.3
BACKGROUND WELLS							
MW-LF-01	0.00698 J	1.980	7.60	< 0.0566	4.55	0.269 J	< 2.38
MW-BG-06	0.00889 J	9.51 J+	17.8	0.0806 J	4.34	0.239 J	65.0
MW-BG-16	N/A	N/A	5.25	N/A	4.61	1.67	<2.38
AS-LF-01	0.00913 J	3.570	3.66	0.0992 J	4.57	15.0	11.0
AS-LF-02	0.0122 J	3.280	8.05	0.0815 J	4.46	10.3	12.0
MW-40 ^[2]	0.0418	37.0 J+	43.6	0.886 J	4.04	169	287
DOWNGRAIENT WELLS							
MW-LF-02	0.0167	5.08 J+	27.7	0.224	4.08	8.32	46.0
MW-LF-03	0.00828 J	1.51 J+	3.18	0.0330 U	4.53	0.613	<2.38
MW-LF-04	0.00909 J	2.07 J+	4.72	0.0330 U	4.53	2.46	17.0
MW-LF-05	0.0112 J	2.91	9.28	0.0696 J	4.32	0.489	12.0
MW-LF-06	0.0952 J	2.91 J+	8.77	0.0362 J	4.46	0.596	9.0 J

Shaded cells indicate an SSI.

[1] pH expressed in standard units (s.u.).

[2] Upgradient well not used in background concentration calculations.

U The analyte was not detected above the level of the sample reporting limit.

J Estimated concentration.

Appendix A

Background Data Set for March 2023

Semiannual Detection Monitoring Event

Appendix A Background Data Set for March 2023 Semiannual Detection Monitoring Event

EVENT	WELL	CONSTITUENT/RESULT (mg/L except as noted) ^[1]						
		BORON	CALCIUM	CHLORIDE	FLUORIDE	pH	SULFATE	TDS
BL-1	MW-LF-01	< 0.0557	4.84	13.7	0.0679	5.4	2.72	72
BL-2	MW-LF-01	< 0.0557	3.77	19	0.14	4.2	1.9	56
BL-3	MW-LF-01	< 0.0557	2.35	6.67	< 0.033	5	0.69	24
BL-4	MW-LF-01	< 0.0557	2.63	11.23	0.0548	4.2	0.63	30
BL-5	MW-LF-01	< 0.0442	2	7.92	0.044	5.4	< 0.5	130
BL-6	MW-LF-01	< 0.0442	2.805	12.48	0.0865	4.6	< 0.5	41
BL-7	MW-LF-01	< 0.0442	2.66	10.87	0.0364	4.4	< 0.5	45
BL-8	MW-LF-01	< 0.0442	2.47	16.03	0.0624	4.2	< 0.5	70
DM-1	MW-LF-01	< 0.0442	1.818	9.06	< 0.033	4.8	< 0.5	32
DM-2	MW-LF-01	< 0.0442	1.93	7.14	< 0.033	4.6	< 0.129	23
DM-3	MW-LF-01	< 0.0219	2.56	15.4	< 0.025	4.3	0.75	41
DM-4	MW-LF-01	< 0.2	2.75	13.2	< 0.1	4.7	< 0.5	46
DM-5	MW-LF-01	< 0.2	2.68	20.6	< 0.1	4.4	< 0.5	51
DM-6	MW-LF-01	0.0545	2.42	9.21	< 0.1	4.6	< 0.5	39
DM-7	MW-LF-01	< 0.2	1.76	7.04	< 0.1	4.1	< 0.5	36
DM-8	MW-LF-01	0.0113	2.99	11.9	<0.033	4.67	0.603	50
DM-9	MW-LF-01	0.0106	3.13	17	0.0913	4.27	0.418	32.9
DM-10	MW-LF-01	0.00698	2.2	8.9	<0.0661	4.42	0.312	10
DM-11	MW-LF-01	0.0112	2.04	9.52	<0.033	4.43	0.371	<2.38

Appendix A Background Data Set for March 2023 Semiannual Detection Monitoring Event

EVENT	WELL	CONSTITUENT/RESULT (mg/L except as noted) ^[1]						
		BORON	CALCIUM	CHLORIDE	FLUORIDE	pH	SULFATE	TDS
BL-4	MW-BG-06	< 0.0557	9.49	18.69	0.0624	3.9	1	106
BL-5	MW-BG-06	< 0.0442	8.86	19.28	0.0631	4.4	< 0.5	84
BL-6	MW-BG-06	< 0.0442	10.02	18.12	0.0883	4.3	< 0.5	118
BL-7	MW-BG-06	< 0.0442	10.1	17.96	0.0621	3.8	< 0.5	103
BL-8	MW-BG-06	< 0.0442	10.6	19.72	0.165	4.1	< 0.5	123
DM-1	MW-BG-06	< 0.0442	9.973	18.3	< 0.033	4	< 0.5	109
DM-2	MW-BG-06	< 0.0442	10.9	19.8	0.0571	4.7	< 0.129	82
DM-3	MW-BG-06	< 0.0219	9.15	18.3	< 0.025	3.98	< 0.129	110
DM-4	MW-BG-06	< 0.2	8.84	18.7	< 0.1	4.4	< 0.5	101
DM-5	MW-BG-06	0.176	9.42	18.6	< 0.1	4.1	< 0.5	109
DM-6	MW-BG-06	< 0.2	11.4	18.9	< 0.1	4.4	< 0.5	143
DM-7	MW-BG-06	< 0.2	10.2	18.3	< 0.1	3.4	< 0.5	125
DM-8	MW-BG-06	0.00944	2.32	18.7	0.0622	4.41	0.296	113
DM-9	MW-BG-06	0.00858	9.42	17.4	0.0793	4.19	0.273	88.6
DM-10	MW-BG-06	0.00861	9.78	18.5	<0.033	4.23	0.133	75.7
DM-11	MW-BG-06	0.0077	9.63	18	<0.033	4.23	0.284	87
BL-4	MW-BG-16	< 0.0557	2.06	4.11	0.0356	4.1	1.09	14
BL-5	MW-BG-16	< 0.0442	1.87	3.98	0.0598	5	1.35	15
BL-6	MW-BG-16	< 0.0442	1.711	3.37	0.0495	4.6	1.31	23
BL-7	MW-BG-16	< 0.0442	1.78	3.03	< 0.033	4.2	1.16	24
BL-8	MW-BG-16	< 0.0442	1.97	3.38	< 0.033	4.1	1.03	43

Appendix A Background Data Set for March 2023 Semiannual Detection Monitoring Event

EVENT	WELL	CONSTITUENT/RESULT (mg/L except as noted) ^[1]						
		BORON	CALCIUM	CHLORIDE	FLUORIDE	pH	SULFATE	TDS
DM-1	MW-BG-16	< 0.0442	2.145	3.81	< 0.033	4.2	0.79	31
DM-2	MW-BG-16	< 0.0442	2.54	5.22	0.034	4.7	0.83	28
DM-3	MW-BG-16	< 0.0219	1.81	3.75	< 0.025	4.14	1.13	26
DM-4	MW-BG-16	< 0.2	1.7	4.12	< 0.1	4.8	1.48	12
DM-5	MW-BG-16	< 0.2	1.58	3.29	< 0.1	4.5	1.41	< 2
DM-6	MW-BG-16	< 0.2	1.93	4.17	< 0.1	4.8	0.87	43
DM-7	MW-BG-16	< 0.2	1.78	2.86	< 0.1	3.8	1.43	31
DM-8	MW-BG-16	0.00939	1.77	<3.47	<0.033	4.77	1.83	22.9
DM-9	MW-BG-16	0.0106	1.62	2.34	0.0661	4.64	1.95	12.9
DM-10	MW-BG-16	0.00964	2.04	3.54	<0.0445	4.78	1.73	4.29
DM-11	MW-BG-16	0.00926	1.89	3.09	<0.033	4.66	2.26	10
DM-1	AS-LF-01	< 1 ^[2]	7.872	6.29	0.0854	5.3	4.65	59
DM-2	AS-LF-01	< 0.0442	4.03	7.07	0.0804	5	2.08	40
DM-3	AS-LF-01	< 0.0219	2.69	7.19	< 0.025 ^[3]	4.28	2.85	33
DM-4	AS-LF-01	< 0.2	3.12	4.5	< 0.1	4.7	8.86	28
DM-5	AS-LF-01	0.0745	2.09	5.2	< 0.1	4.4	5.35	22
DM-6	AS-LF-01	< 0.2	3.09	3.02	< 0.1	4.7	12.8	38
DM-7	AS-LF-01	< 0.2	2.19	2.14	< 0.1	4.1	13.4	45
DM-8	AS-LF-01	0.0129	3.08	2.04	0.0415	4.77	15.6	40
DM-9	AS-LF-01	0.0186	1.68	3.31	<0.033	4.56	8.71	25.7
DM-10	AS-LF-01	0.0123	4.01	5.27	0.0748	4.49	15.1	24.3

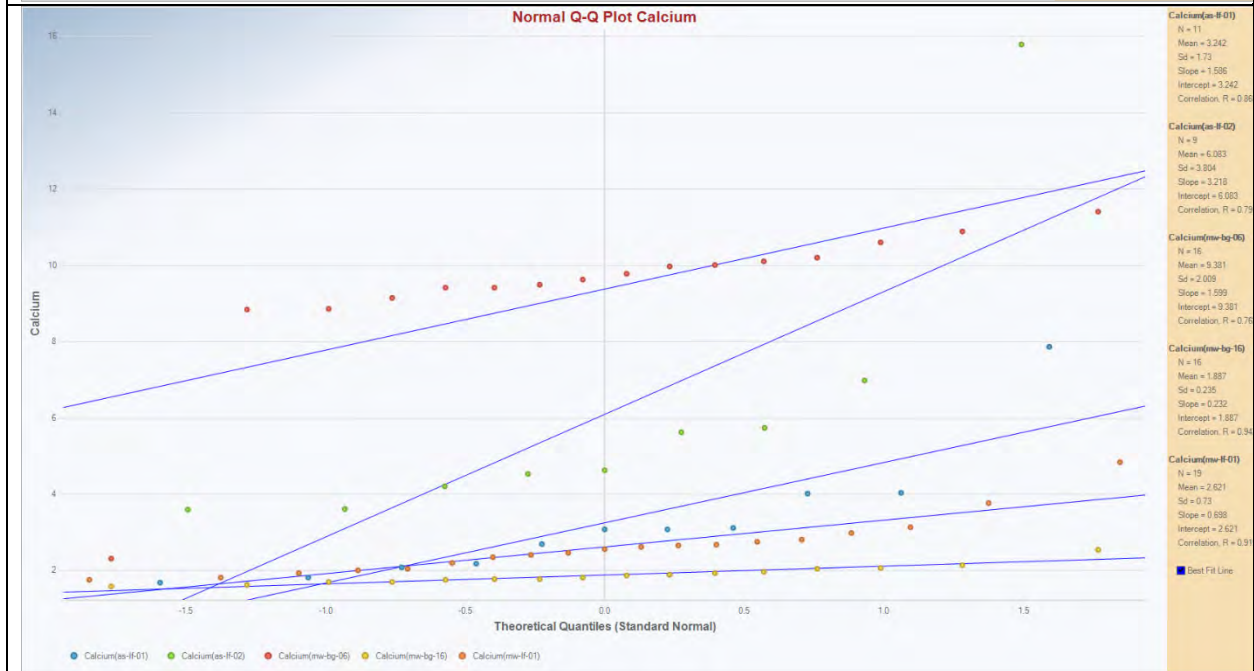
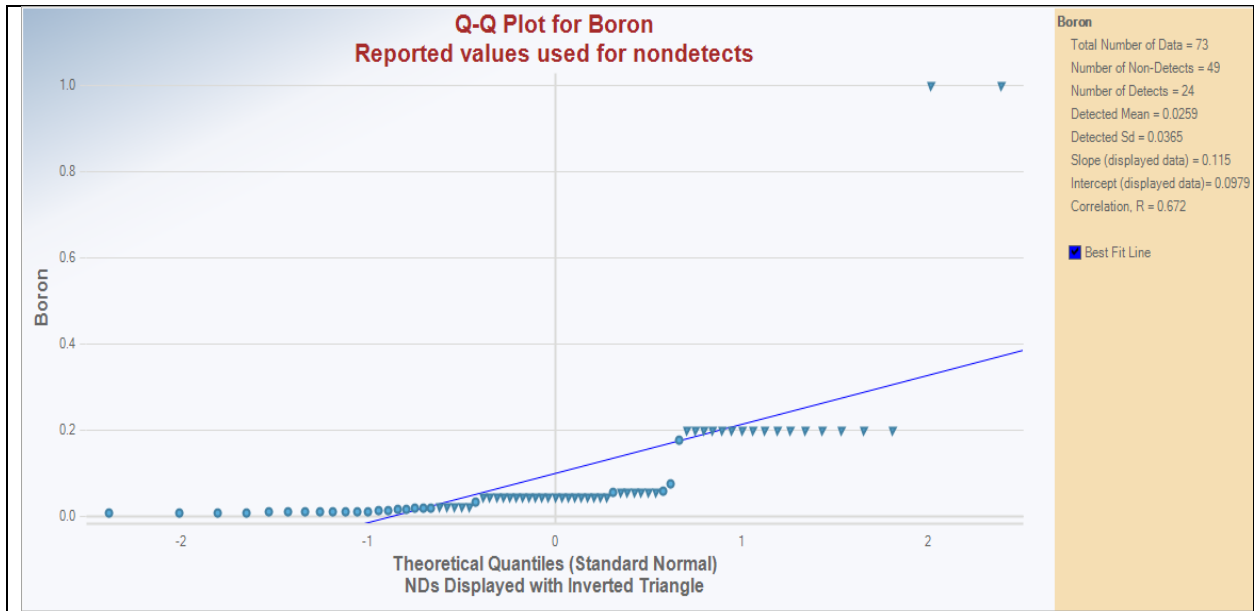
Appendix A Background Data Set for March 2023 Semiannual Detection Monitoring Event

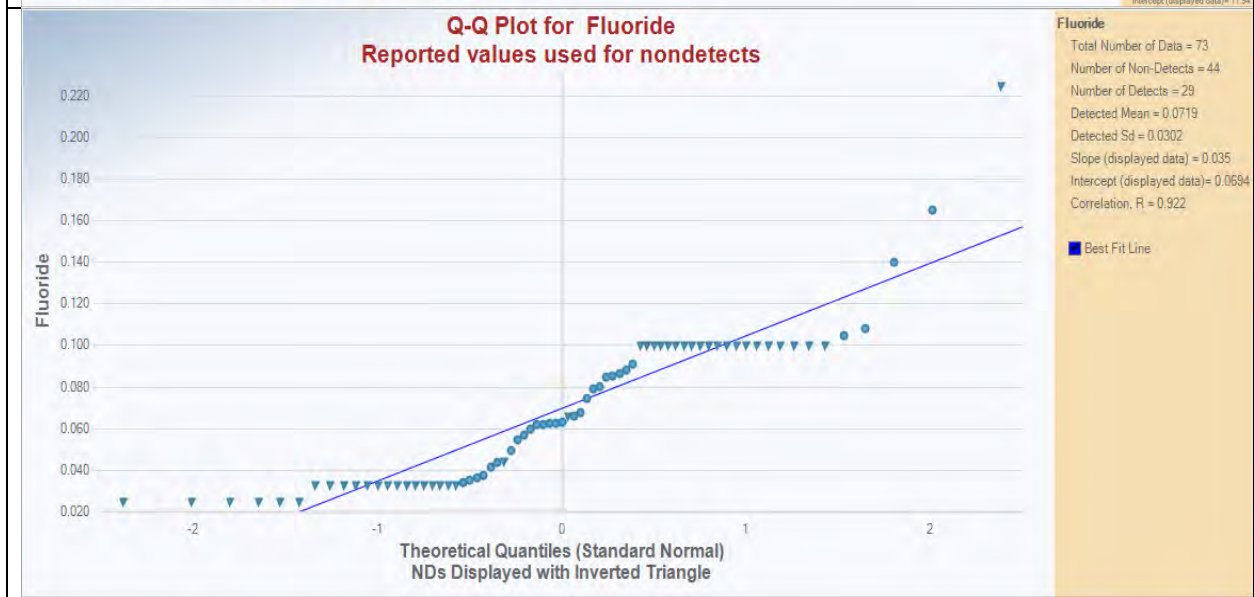
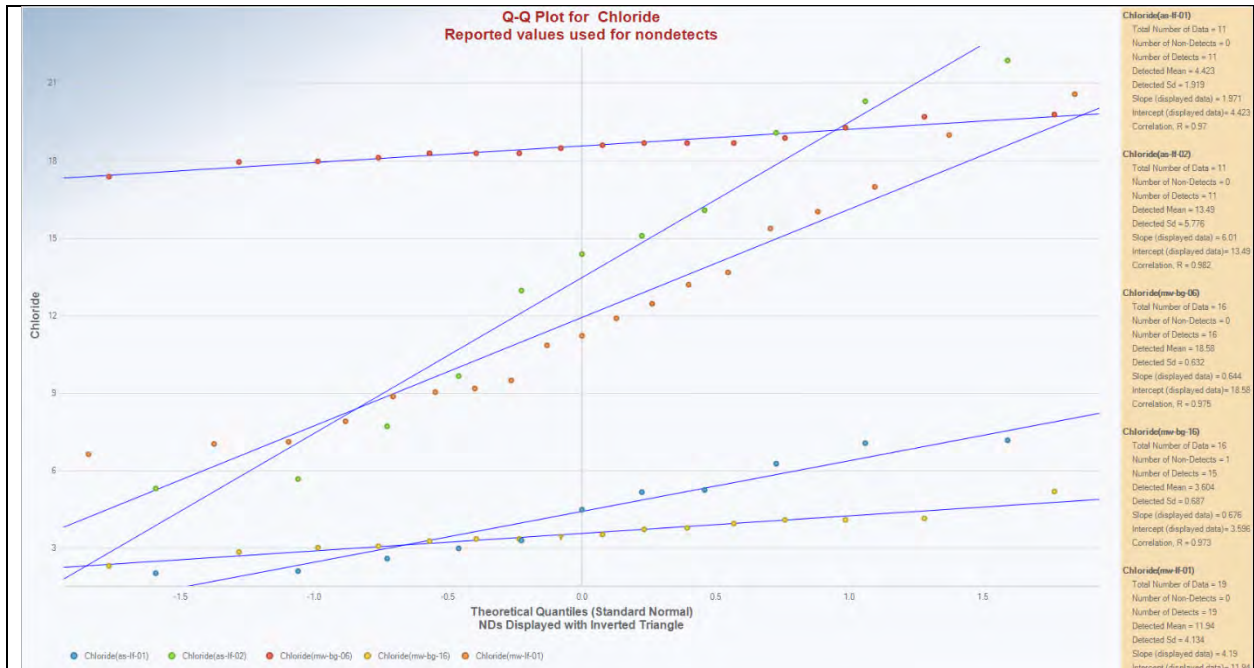
EVENT	WELL	CONSTITUENT/RESULT (mg/L except as noted) ^[1]						
		BORON	CALCIUM	CHLORIDE	FLUORIDE	pH	SULFATE	TDS
DM-11	AS-LF-01	0.0195	1.81	2.62	<0.033	4.3	12	9
DM-1	AS-LF-02	< 1 ^[2]	24.06 ^[4]	21.9	0.025 ^[3]	6.3	14.3	203
DM-2	AS-LF-02	< 0.0442	24.4 ^[2]	20.3	0.108	5.8	3.35	107
DM-3	AS-LF-02	< 0.0219	15.8	19.1	< 0.025	5.29	4.7	104
DM-4	AS-LF-02	< 0.2	5.74	14.4	< 0.1	5	14.5	76
DM-5	AS-LF-02	< 0.2	6.98	16.1	< 0.1	4.8	7.02	64
DM-6	AS-LF-02	< 0.2	4.22	9.67	< 0.1	4.7	16.1	75
DM-7	AS-LF-02	0.0577	4.63	5.71	< 0.1	4.2	21.6	64
DM-8	AS-LF-02	0.0161	3.59	7.74	0.0846	4.72	13.4	38.6
DM-9	AS-LF-02	0.0191	5.63	15.1	0.105	4.35	9.07	41.4
DM-10	AS-LF-02	0.0163	4.54	13	<0.225	4.39	10.1	42.9
DM-11	AS-LF-02	0.0317	3.62	5.34	0.0375	4.41	16.4	36

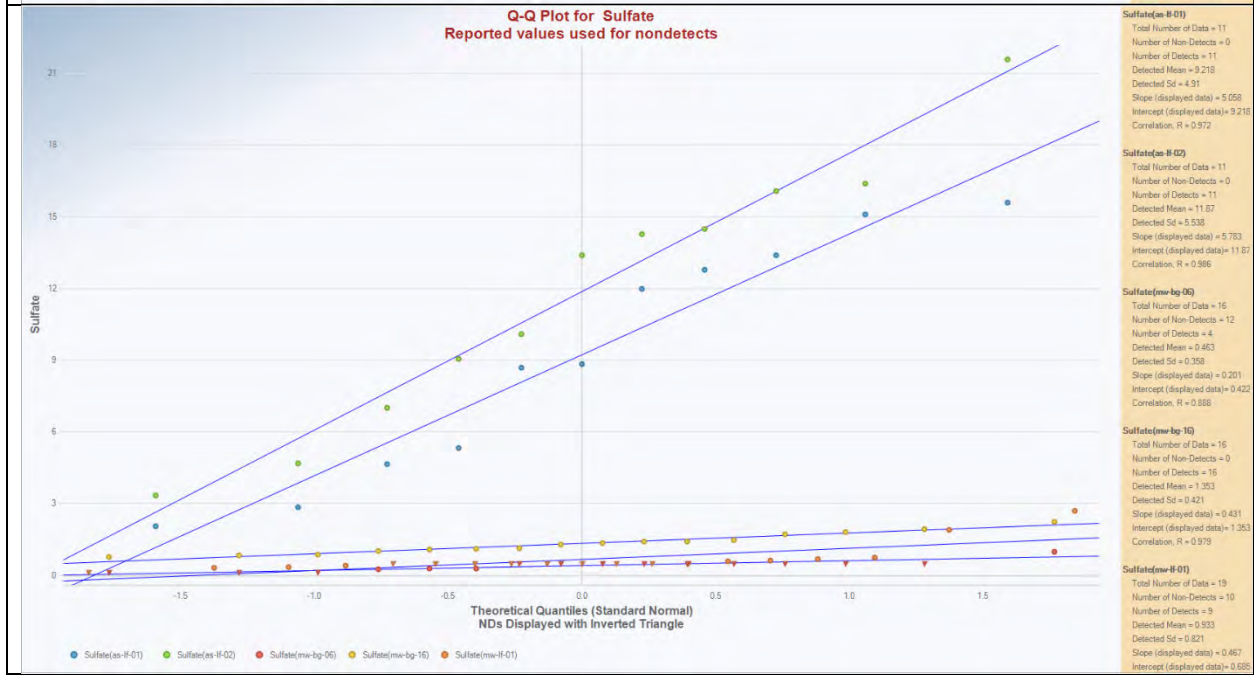
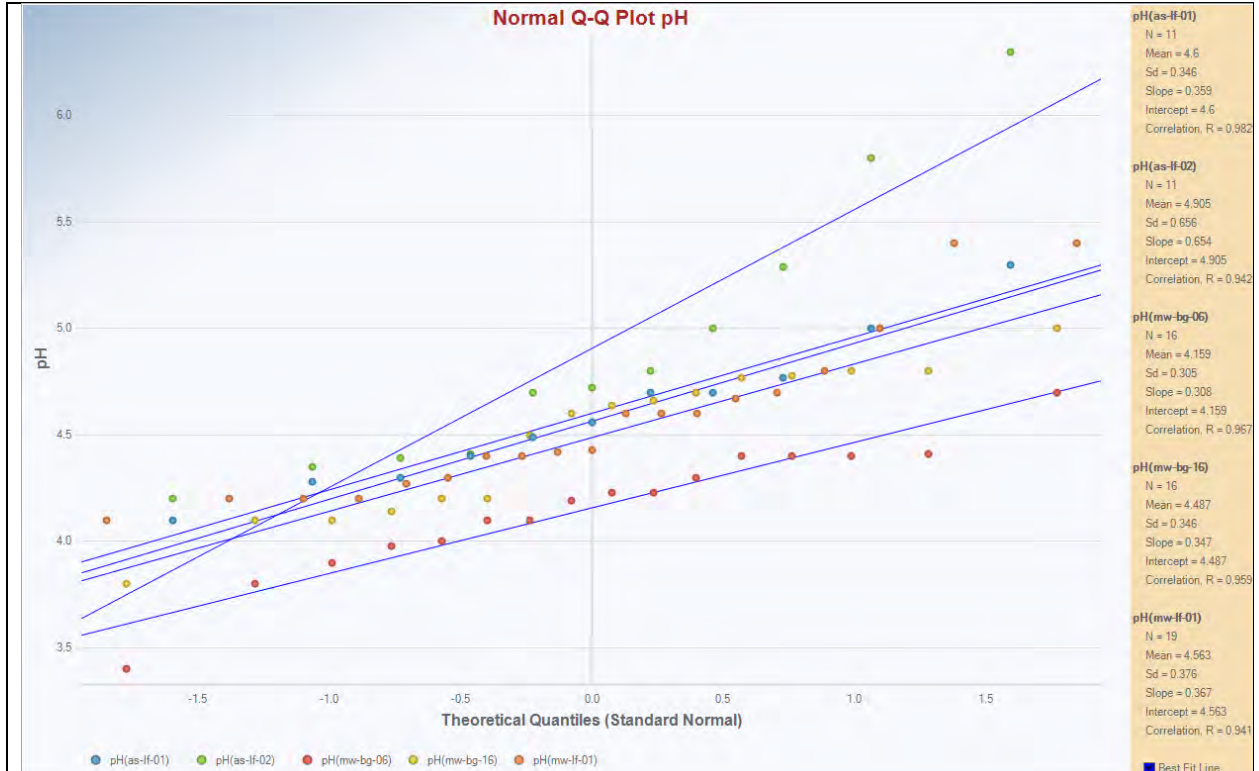
- [1] pH expressed in standard units (s.u.)
- [2] Outlier with no verification resample – removed from data set
- [3] Outlier data replaced by verification resample result (value shown on table)
- [4] Outlier data replace by verification resample result (shown), which was then removed as an outlier.
- < Result less than the indicated detection limit.

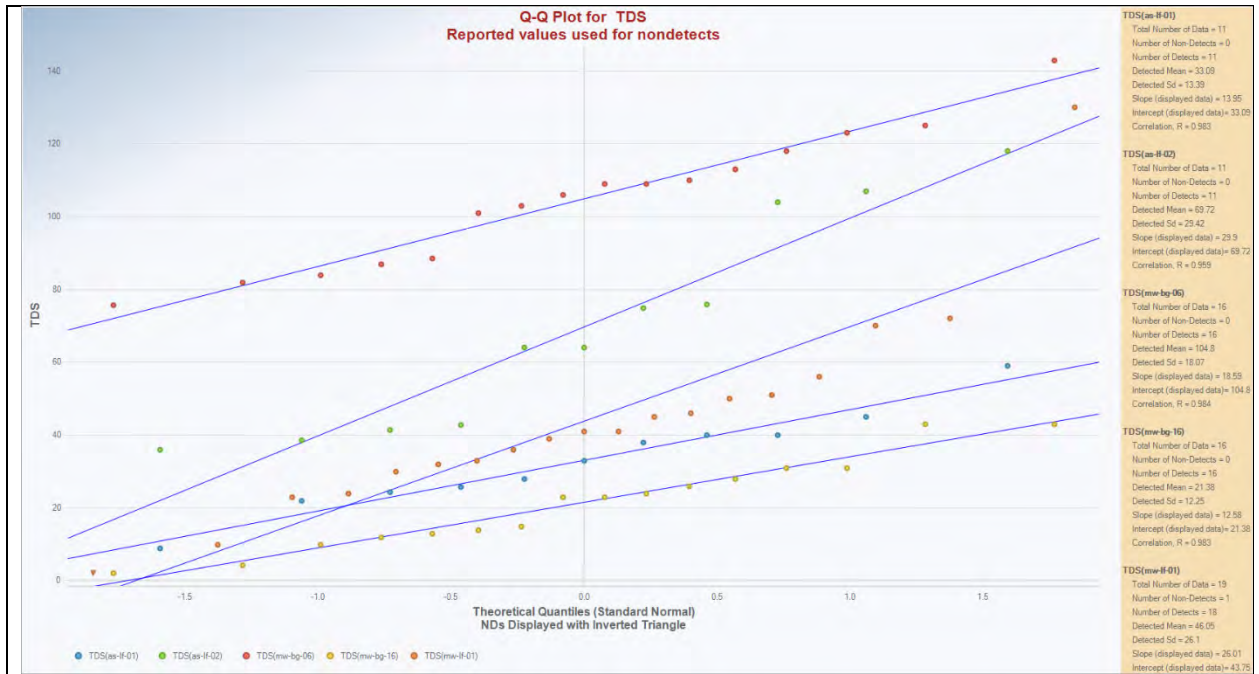
Appendix B

Probability (Q-Q) Plots









Appendix C

Two Sample Hypothesis Test Outputs

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensored Full Data Sets without NDs

User Selected Options

Date/Time of Computation ProUCL 5.2 6/2/2023 11:30:38 AM
From File proUCL_input_data_Cope.xls
Full Precision OFF
Confidence Coefficient 95%
Substantial Difference 0.000
Selected Null Hypothesis Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
Alternative Hypothesis Sample 1 Mean/Median \neq Sample 2 Mean/Median

Sample 1 Data: Calcium (previous)

Sample 2 Data: Calcium (new)

Raw Statistics		
	Sample 1	Sample 2
Number of Valid Observations	51	20
Number of Missing Observations	2	0
Number of Distinct Observations	49	19
Minimum	1.58	1.62
Maximum	15.8	9.78
Mean	4.779	3.84
Median	2.69	3.035
SD	3.64	2.703
SE of Mean	0.51	0.605

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1892
WMW U-Stat	566
Standardized WMW U-Stat	0.716
Mean (U)	510
SD(U) - Adj ties	78.23
Lower Approximate U-Stat Critical Value (0.025)	-1.96
Upper Approximate U-Stat Critical Value (0.975)	1.96
P-Value (Adjusted for Ties)	0.474

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value \geq alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation ProUCL 5.2 6/2/2023 11:31:59 AM
 From File proUCL_input_data_Cope.xls
 Full Precision OFF
 Confidence Coefficient 95%
 Selected Null Hypothesis Sample 1 Mean/Median = Sample 2 Mean/Median (2 Sided Alternative)
 Alternative Hypothesis Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Chloride (previous)

Sample 2 Data: Chloride (new)

Raw Statistics		
	Sample 1	Sample 2
Number of Valid Data	53	20
Number of Non-Detects	0	1
Number of Detect Data	53	19
Minimum Non-Detect	N/A	3.47
Maximum Non-Detect	N/A	3.47
Percent Non-detects	0.00%	5.00%
Minimum Detect	2.14	2.04
Maximum Detect	21.9	18.7
Mean of Detects	11.17	9.648
Median of Detects	9.67	8.9
SD of Detects	6.565	6.295

WMW test is meant for a Single Detection Limit Case

Use of Gehan or T-W test is suggested when multiple detection limits are present

All observations <= 3.47 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	2073
WMW U-Stat	641.5
Standardized WMW U-Stat	1.383
Mean (U)	530
SD(U) - Adj ties	80.85
Lower Approximate U-Stat Critical Value (0.025)	-1.96
Upper Approximate U-Stat Critical Value (0.975)	1.96
P-Value (Adjusted for Ties)	0.167

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Uncensor Full Data Sets without NDs

User Selected Options

Date/Time of Computation ProUCL 5.2 6/2/2023 11:31:21 AM
 From File proUCL_input_data_Cope.xls

Full Precision OFF
 Confidence Coefficient 95%
 Substantial Difference 0.000
 Selected Null Hypothesis Sample 1 Mean/Median = Sample 2 Mean/Median (Two Sided Alternative)
 Alternative Hypothesis Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: pH (previous)

Sample 2 Data: pH (new)

Raw Statistics		
	Sample 1	Sample 2
Number of Valid Observations	53	20
Number of Distinct Observations	21	17
Minimum	3.4	4.19
Maximum	6.3	4.78
Mean	4.526	4.485
Median	4.4	4.425
SD	0.525	0.198
SE of Mean	0.072	0.0442

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1932
WMW U-Stat	501
Standardized WMW U-Stat	-0.359
Mean (U)	530
SD(U) - Adj ties	80.74
Lower Approximate U-Stat Critical Value (0.025)	-1.96
Upper Approximate U-Stat Critical Value (0.975)	1.96
P-Value (Adjusted for Ties)	0.719

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options
 Date/Time of Computation ProUCL 5.2 6/2/2023 11:32:50 AM
 From File proUCL_input_data_Cope.xls
 Full Precision OFF

Confidence Coefficient 95%
 Selected Null Hypothesis Sample 1 Mean/Median = Sample 2 Mean/Median (2 Sided Alternative)
 Alternative Hypothesis Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: Sulfate (previous)
Sample 2 Data: Sulfate (new)

Raw Statistics		
	Sample 1	Sample 2
Number of Valid Data	53	20
Number of Non-Detects	21	1
Number of Detect Data	32	19
Minimum Non-Detect	0.129	0.133
Maximum Non-Detect	0.5	0.133
Percent Non-detects	39.62%	5.00%
Minimum Detect	0.63	0.273
Maximum Detect	21.6	16.4
Mean of Detects	4.785	5.827
Median of Detects	1.69	1.95
SD of Detects	5.694	6.215

WMW test is meant for a Single Detection Limit Case
Use of Gehan or T-W test is suggested when multiple detection limits are present

All observations <= 0.5 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	1856
WMW U-Stat	425
Standardized WMW U-Stat	-1.337
Mean (U)	530
SD(U) - Adj ties	80.85
Lower Approximate U-Stat Critical Value (0.025)	-1.96
Upper Approximate U-Stat Critical Value (0.975)	1.96
P-Value (Adjusted for Ties)	0.181

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Sample 1 = Sample 2

P-Value >= alpha (0.05)

Wilcoxon-Mann-Whitney Sample 1 vs Sample 2 Comparison Test for Data Sets with Non-Detects

User Selected Options
 Date/Time of Computation ProUCL 5.2 6/2/2023 11:33:30 AM
 From File proUCL_input_data_Cope.xls
 Full Precision OFF
 Confidence Coefficient 95%
 Selected Null Hypothesis Sample 1 Mean/Median = Sample 2 Mean/Median (2 Sided Alternative)
 Alternative Hypothesis Sample 1 Mean/Median <> Sample 2 Mean/Median

Sample 1 Data: TDS(previous)

Sample 2 Data: TDS(new)

Raw Statistics		
	Sample 1	Sample 2
Number of Valid Data	53	20
Number of Non-Detects	0	1
Number of Detect Data	53	19
Minimum Non-Detect	N/A	2.38
Maximum Non-Detect	N/A	2.38
Percent Non-detects	0.00%	5.00%
Minimum Detect	2	4.29
Maximum Detect	143	113
Mean of Detects	60.64	40.27
Median of Detects	45	36
SD of Detects	37.58	30.61

WMW test is meant for a Single Detection Limit Case

Use of Gehan or T-W test is suggested when multiple detection limits are present

All observations <= 2.38 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Sample 1 = Mean/Median of Sample 2

Sample 1 Rank Sum W-Stat	2154
WMW U-Stat	722.5
Standardized WMW U-Stat	2.381
Mean (U)	530
SD(U) - Adj ties	80.84
Lower Approximate U-Stat Critical Value (0.025)	-1.96
Upper Approximate U-Stat Critical Value (0.975)	1.96
P-Value (Adjusted for Ties)	0.0173

Conclusion with Alpha = 0.05

Reject H0, Conclude Sample 1 <> Sample 2

P-Value < alpha (0.05)

Theil-Sen Trend Test Analysis

User Selected Options
Date/Time of Computation ProUCL 5.2 6/2/2023 12:27:22 PM
From File WorkSheet.xls
Full Precision OFF
Average Replicates Replicates at sampling events will be averaged!
Confidence Coefficient 0.95
Level of Significance 0.05

TDS

General Statistics

Number of Events	11
Number of Values Reported (n)	11
Number of Values After Averaging	11
Number of Replicates	0
Minimum	28.88
Maximum	69.8
Mean	52.01
Geometric Mean	50.15
Median	52.9
Standard Deviation	13.64
Coefficient of Variation	0.262

Mann-Kendall Statistics

M-K Test Value (S)	-35
Tabulated p-value	0.003
Standard Deviation of S	12.85
Standardized Value of S	-2.647
Approximate p-value	0.00406

Approximate inference for Theil-Sen Trend Test

Number of Slopes	55
Theil-Sen Slope	-0.0195
Theil-Sen Intercept	909.2
M2'	38.06
One-sided 95% upper limit of Slope	-0.0122
95% LCL of Slope (0.025)	-0.0398
95% UCL of Slope (0.975)	-0.0108

Statistically significant evidence of a decreasing trend at the specified level of significance.

Theil-Sen Trend Test Estimates and Residuals

#	Events	Values	Estimates	Residuals
1	43080	69.8	69.01	0.79
2	43180	56	67.06	-11.06
3	43361	62.8	63.53	-0.73
4	43544	52.6	59.96	-7.361
5	43728	49.6	56.37	-6.772
6	43906	67.6	52.9	14.7
7	44092	60.2	49.27	10.93
8	44270	52.9	45.8	7.1
9	44467	40.3	41.96	-1.658
10	44629	31.44	38.8	-7.361
11	44803	28.88	35.4	-6.529

Appendix D

Background Threshold Values

Background Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.2 6/2/2023 2:44:31 PM
From File	P:\Clients\Dominion\South Carolina Sites\7_Cope Station SC\CCR\Class_3_Landfill\2023\proUCL\proUCL_input_data_Cope.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	5
Number of Bootstrap Operations	2000

Calcium

General Statistics

Total Number of Observations	71	Number of Distinct Observations	66
		Number of Missing Observations	2
Minimum	1.58	First Quartile	2.02
Second Largest	11.4	Median	2.75
Maximum	15.8	Third Quartile	6.36
Mean	4.514	SD	3.41
Coefficient of Variation	0.755	Skewness	1.234
Mean of logged Data	1.267	SD of logged Data	0.67

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.983	d2max (for USL)	3.089
------------------------------	-------	-----------------	-------

Normal GOF Test

Shapiro Wilk Test Statistic	0.772
1% Shapiro Wilk P Value	4.441E-15
Lilliefors Test Statistic	0.249
1% Lilliefors Critical Value	0.122

Normal GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	11.28	90% Percentile (z)	8.885
95% UPL (t)	10.24	95% Percentile (z)	10.12
95% UPL for Next 5 Observations	12.69	99% Percentile (z)	12.45
95% UPL for Mean of 5 Observations	7.145	95% USL	15.05

Gamma GOF Test

A-D Test Statistic	4.456
5% A-D Critical Value	0.762
K-S Test Statistic	0.204
5% K-S Critical Value	0.107

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.236	k star (bias corrected MLE)	2.151
Theta hat (MLE)	2.019	Theta star (bias corrected MLE)	2.099
nu hat (MLE)	317.5	nu star (bias corrected)	305.4
MLE Mean (bias corrected)	4.514	MLE Sd (bias corrected)	3.078

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	10.49	90% Percentile	8.632
95% Hawkins Wixley (HW) Approx. Gamma UPL	10.57	95% Percentile	10.47
95% WH UPL for Next 5 Observations	14.81	99% Percentile	14.52
95% HW UPL for Next 5 Observations	15.33		
95% WH Approx. Gamma UTL with 95% Coverage	12.2	95% HW Approx. Gamma UTL with 95% Coverage	12.42
95% WH USL	19.97	95% HW USL	21.29

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.857
10% Shapiro Wilk P Value	3.5223E-9

Shapiro Wilk Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors Test Statistic 0.166
 10% Lilliefors Critical Value 0.0962

Lilliefors Lognormal GOF Test
 Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	13.4	90% Percentile (z)	8.378
95% UPL (t)	10.93	95% Percentile (z)	10.69
95% UPL for Next 5 Observations	17.69	99% Percentile (z)	16.87
95% UPL for Mean of 5 Observations	5.953	95% USL	28.12

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	71	95% UTL with 95% Coverage	15.8
Approx, f used to compute achieved CC	1.842	Approximate Actual Confidence Coefficient achieved by UTL	0.876
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	11.4	95% BCA Bootstrap UTL with 95% Coverage	11.15
95% UPL	10.72	90% Percentile	9.973
90% Chebyshev UPL	14.82	95% Percentile	10.4
95% Chebyshev UPL	19.48	99% Percentile	12.72
		95% USL	15.8

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

pH

General Statistics

Total Number of Observations	73	Number of Distinct Observations	37
Minimum	3.4	First Quartile	4.2
Second Largest	5.8	Median	4.41
Maximum	6.3	Third Quartile	4.7
Mean	4.515	SD	0.458
Coefficient of Variation	0.101	Skewness	1.095
Mean of logged Data	1.503	SD of logged Data	0.0979

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.977	d2max (for USL)	3.099
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Normal GOF Test

Shapiro Wilk Test Statistic	0.94
1% Shapiro Wilk P Value	0.00285
Lilliefors Test Statistic	0.13
1% Lilliefors Critical Value	0.12

Normal GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5.42	90% Percentile (z)	5.101
95% UPL (t)	5.282	95% Percentile (z)	5.267
95% UPL for Next 5 Observations	5.611	99% Percentile (z)	5.579
95% UPL for Mean of 5 Observations	4.867	95% USL	5.933

Gamma GOF Test

A-D Test Statistic	0.989
5% A-D Critical Value	0.749
K-S Test Statistic	0.117

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

5% K-S Critical Value 0.104

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	103.8	k star (bias corrected MLE)	99.53
Theta hat (MLE)	0.0435	Theta star (bias corrected MLE)	0.0454
nu hat (MLE)	15153	nu star (bias corrected)	14532
MLE Mean (bias corrected)	4.515	MLE Sd (bias corrected)	0.453

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	5.289	90% Percentile	5.104
95% Hawkins Wixley (HW) Approx. Gamma UPL	5.291	95% Percentile	5.284
95% WH UPL for Next 5 Observations	5.653	99% Percentile	5.634
95% HW UPL for Next 5 Observations	5.66		
95% WH Approx. Gamma UTL with 95% Coverage	5.439	95% HW Approx. Gamma UTL with 95% Coverage	5.442
95% WH USL	6.026	95% HW USL	6.04

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.968
10% Shapiro Wilk P Value	0.192
Lilliefors Test Statistic	0.113
10% Lilliefors Critical Value	0.0949

Shapiro Wilk Lognormal GOF Test

Data appear Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	5.453	90% Percentile (z)	5.094
95% UPL (t)	5.295	95% Percentile (z)	5.278
95% UPL for Next 5 Observations	5.681	99% Percentile (z)	5.643
95% UPL for Mean of 5 Observations	4.845	95% USL	6.087

Nonparametric Distribution Free Background Statistics

Data appear Approximate Lognormal at 10% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	73	95% UTL with 95% Coverage	6.3
Approx, f used to compute achieved CC	1.895	Approximate Actual Confidence Coefficient achieved by UTL	0.885
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	5.8	95% BCA Bootstrap UTL with 95% Coverage	5.8
95% UPL	5.4	90% Percentile	5
90% Chebyshev UPL	5.897	95% Percentile	5.34
95% Chebyshev UPL	6.523	99% Percentile	5.94
95% USL	6.3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation ProUCL 5.2 6/2/2023 2:45:30 PM
 From File proUCL_input_data_Cope.xls
 Full Precision OFF
 Confidence Coefficient 95%
 Coverage 95%
 Different or Future K Observations 5
 Number of Bootstrap Operations 2000

Boron

General Statistics

Total Number of Observations	71	Number of Missing Observations	2
Number of Distinct Observations	27		
Number of Detects	24	Number of Non-Detects	47
Number of Distinct Detects	23	Number of Distinct Non-Detects	4
Minimum Detect	0.00698	Minimum Non-Detect	0.0219
Maximum Detect	0.176	Maximum Non-Detect	0.2
Variance Detected	0.00134	Percent Non-Detects	66.2%
Mean Detected	0.0259	SD Detected	0.0365
Mean of Detected Logged Data	-4.104	SD of Detected Logged Data	0.824

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.983	d2max (for USL)	3.089
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.529
1% Shapiro Wilk Critical Value	0.884
Lilliefors Test Statistic	0.362
1% Lilliefors Critical Value	0.205

Shapiro Wilk GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0186	KM SD	0.0249
95% UTL95% Coverage	0.0679	95% KM UPL (t)	0.0603
95% KM UPL for Next 5 Observations	0.0782	95% KM UPL for Mean of Next 5 Observations	0.0378
90% KM Percentile (z)	0.0505	95% KM Percentile (z)	0.0595
99% KM Percentile (z)	0.0765	95% KM USL	0.0955

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0407	SD	0.0386
95% UTL95% Coverage	0.117	95% UPL (t)	0.106
95% UPL for Next 5 Observations	0.133	95% UPL for Mean of Next 5 Observations	0.0705
90% Percentile (z)	0.0902	95% Percentile (z)	0.104
99% Percentile (z)	0.131	95% USL	0.16

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.517	Anderson-Darling GOF Test
5% A-D Critical Value	0.767	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.29	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.182	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.247	k star (bias corrected MLE)	1.119
Theta hat (MLE)	0.0208	Theta star (bias corrected MLE)	0.0232
nu hat (MLE)	59.87	nu star (bias corrected)	53.72
MLE Mean (bias corrected)	0.0259		
MLE Sd (bias corrected)	0.0245	95% Percentile of Chisquare (2kstar)	6.445

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.00698	Mean	0.0215
Maximum	0.176	Median	0.0113
SD	0.0239	CV	1.109
k hat (MLE)	1.895	k star (bias corrected MLE)	1.824
Theta hat (MLE)	0.0114	Theta star (bias corrected MLE)	0.0118
nu hat (MLE)	269.1	nu star (bias corrected)	259.1
MLE Mean (bias corrected)	0.0215	MLE Sd (bias corrected)	0.016
95% Percentile of Chisquare (2kstar)	8.912	90% Percentile	0.0428
95% Percentile	0.0526	99% Percentile	0.0745

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0606	0.0603	95% Approx. Gamma UPL	0.0516	0.0509
95% Gamma USL	0.102	0.106	95% UPL for Next 5 Observations	0.0744	0.0751

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0186	SD (KM)	0.0249
Variance (KM)	6.1982E-4	SE of Mean (KM)	0.00354
k hat (KM)	0.556	k star (KM)	0.541
nu hat (KM)	78.89	nu star (KM)	76.89
theta hat (KM)	0.0334	theta star (KM)	0.0343
80% gamma percentile (KM)	0.0306	90% gamma percentile (KM)	0.0494
95% gamma percentile (KM)	0.0693	99% gamma percentile (KM)	0.118

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0516	0.0502	95% Approx. Gamma UPL	0.0439	0.0425
95% KM Gamma Percentile	0.0431	0.0417	95% Gamma USL	0.0869	0.0874

Lognormal GOF Test on Detected Observations Only

		Shapiro Wilk GOF Test
Shapiro Wilk Test Statistic	0.822	
10% Shapiro Wilk Critical Value	0.93	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.212	Lilliefors GOF Test
10% Lilliefors Critical Value	0.162	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.019	Mean in Log Scale	-4.245
SD in Original Scale	0.0226	SD in Log Scale	0.663
95% UTL95% Coverage	0.0534	95% BCA UTL95% Coverage	0.0745
95% Bootstrap (%) UTL95% Coverage	0.0745	95% UPL (t)	0.0437
95% UPL for Next 5 Observations	0.0704	95% UPL for Mean of 5 Observations	0.0239
90% Percentile (z)	0.0336	95% Percentile (z)	0.0427
99% Percentile (z)	0.0671	95% USL	0.111

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-4.288	95% KM UTL (Lognormal)95% Coverage	0.047
KM SD of Logged Data	0.621	95% KM UPL (Lognormal)	0.0389
95% KM Percentile Lognormal (z)	0.0381	95% KM USL (Lognormal)	0.0934

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0407	Mean in Log Scale	-3.6
SD in Original Scale	0.0386	SD in Log Scale	0.876
95% UTL95% Coverage	0.155	95% UPL (t)	0.119
95% UPL for Next 5 Observations	0.223	95% UPL for Mean of 5 Observations	0.0537
90% Percentile (z)	0.0839	95% Percentile (z)	0.115

99% Percentile (z) 0.21 95% USL 0.409

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	70	95% UTL with 95% Coverage	0.2
Approx, f used to compute achieved CC	1.842	Approximate Actual Confidence Coefficient achieved by UTL	0.876
Approximate Sample Size needed to achieve specified CC	59	95% UPL	0.2
95% USL 0.2		95% KM Chebyshev UPL	0.128

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Chloride

General Statistics

Total Number of Observations	73	Number of Missing Observations	0
Number of Distinct Observations	70	Number of Non-Detects	1
Number of Detects	72	Number of Distinct Non-Detects	1
Number of Distinct Detects	69	Minimum Non-Detect	3.47
Minimum Detect	2.04	Maximum Non-Detect	3.47
Maximum Detect	21.9	Percent Non-Detects	1.37%
Variance Detected	42.07	SD Detected	6.486
Mean Detected	10.77	SD of Detected Logged Data	0.728
Mean of Detected Logged Data	2.147		

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.977	d2max (for USL)	3.099
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.865
1% Shapiro Wilk P Value	9.2967E-9
Lilliefors Test Statistic	0.144
1% Lilliefors Critical Value	0.121

Normal GOF Test on Detected Observations Only

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	10.66	KM SD	6.463
95% UTL95% Coverage	23.44	95% KM UPL (t)	21.5
95% KM UPL for Next 5 Observations	26.14	95% KM UPL for Mean of Next 5 Observations	15.64
90% KM Percentile (z)	18.94	95% KM Percentile (z)	21.29
99% KM Percentile (z)	25.69	95% KM USL	30.69

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	10.64	SD	6.527
95% UTL95% Coverage	23.55	95% UPL (t)	21.59
95% UPL for Next 5 Observations	26.28	95% UPL for Mean of Next 5 Observations	15.67
90% Percentile (z)	19.01	95% Percentile (z)	21.38
99% Percentile (z)	25.83	95% USL	30.87

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	2.461
5% A-D Critical Value	0.761
K-S Test Statistic	0.14
5% K-S Critical Value	0.106

Anderson-Darling GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov GOF

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.335	k star (bias corrected MLE)	2.247
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Theta hat (MLE)	4.61	Theta star (bias corrected MLE)	4.791
nu hat (MLE)	336.3	nu star (bias corrected)	323.6
MLE Mean (bias corrected)	10.77		
MLE Sd (bias corrected)	7.182	95% Percentile of Chisquare (2kstar)	10.28

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	2.04	Mean	10.67
Maximum	21.9	Median	9.21
SD	6.493	CV	0.608
k hat (MLE)	2.314	k star (bias corrected MLE)	2.228
Theta hat (MLE)	4.612	Theta star (bias corrected MLE)	4.79
nu hat (MLE)	337.8	nu star (bias corrected)	325.3
MLE Mean (bias corrected)	10.67	MLE Sd (bias corrected)	7.149
95% Percentile of Chisquare (2kstar)	10.22	90% Percentile	20.24
95% Percentile	24.47	99% Percentile	33.8

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	28.62	29.88	95% Approx. Gamma UPL	24.72	25.46
95% Gamma USL	46.83	51.66	95% UPL for Next 5 Observations	34.72	36.97

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	10.66	SD (KM)	6.463
Variance (KM)	41.76	SE of Mean (KM)	0.762
k hat (KM)	2.72	k star (KM)	2.618
nu hat (KM)	397.1	nu star (KM)	382.2
theta hat (KM)	3.918	theta star (KM)	4.072

80% gamma percentile (KM)	15.45	90% gamma percentile (KM)	19.49
95% gamma percentile (KM)	23.28	99% gamma percentile (KM)	31.56

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	28.51	29.77	95% Approx. Gamma UPL	24.63	25.37
95% KM Gamma Percentile	24.23	24.92	95% Gamma USL	46.66	51.47

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.882
10% Shapiro Wilk P Value	1.6605E-7
Lilliefors Test Statistic	0.143
10% Lilliefors Critical Value	0.0955

Shapiro Wilk GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors GOF Test

Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	10.66	Mean in Log Scale	2.134
SD in Original Scale	6.502	SD in Log Scale	0.732
95% UTL95% Coverage	35.94	95% BCA UTL95% Coverage	20.6
95% Bootstrap (%) UTL95% Coverage	20.6	95% UPL (t)	28.86
95% UPL for Next 5 Observations	48.82	95% UPL for Mean of 5 Observations	14.85
90% Percentile (z)	21.59	95% Percentile (z)	28.17
99% Percentile (z)	46.41	95% USL	81.74

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	2.132	95% KM UTL (Lognormal)95% Coverage	35.7
KM SD of Logged Data	0.73	95% KM UPL (Lognormal)	28.69
95% KM Percentile Lognormal (z)	28.01	95% KM USL (Lognormal)	80.95

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	10.64	Mean in Log Scale	2.125
SD in Original Scale	6.527	SD in Log Scale	0.747
95% UTL95% Coverage	36.68	95% UPL (t)	29.32

95% UPL for Next 5 Observations	50.12	95% UPL for Mean of 5 Observations	14.89
90% Percentile (z)	21.81	95% Percentile (z)	28.61
99% Percentile (z)	47.6	95% USL	84.77

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	72	95% UTL with 95% Coverage	21.9
Approx, f used to compute achieved CC	1.895	Approximate Actual Confidence Coefficient achieved by UTL	0.885
Approximate Sample Size needed to achieve specified CC	59	95% UPL	19.95
95% USL 21.9		95% KM Chebyshev UPL	39.02

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Fluoride

General Statistics

Total Number of Observations	73	Number of Missing Observations	0
Number of Distinct Observations	33	Number of Non-Detects	44
Number of Detects	29	Number of Distinct Non-Detects	6
Number of Distinct Detects	28	Minimum Non-Detect	0.025
Minimum Detect	0.034	Maximum Non-Detect	0.225
Maximum Detect	0.165	Percent Non-Detects	60.27%
Variance Detected	9.1425E-4	SD Detected	0.0302
Mean Detected	0.0719	SD of Detected Logged Data	0.395
Mean of Detected Logged Data	-2.71		

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.977	d2max (for USL)	3.099
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.894
1% Shapiro Wilk Critical Value	0.898
Lilliefors Test Statistic	0.139
1% Lilliefors Critical Value	0.189

Shapiro Wilk GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Detected Data appear Normal at 1% Significance Level

Detected Data appear Approximate Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0496	KM SD	0.0299
95% UTL95% Coverage	0.109	95% KM UPL (t)	0.0998
95% KM UPL for Next 5 Observations	0.121	95% KM UPL for Mean of Next 5 Observations	0.0726
90% KM Percentile (z)	0.0879	95% KM Percentile (z)	0.0988
99% KM Percentile (z)	0.119	95% KM USL	0.142

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.049	SD	0.0311
95% UTL95% Coverage	0.11	95% UPL (t)	0.101
95% UPL for Next 5 Observations	0.123	95% UPL for Mean of Next 5 Observations	0.0729
90% Percentile (z)	0.0888	95% Percentile (z)	0.1
99% Percentile (z)	0.121	95% USL	0.145

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.348
5% A-D Critical Value	0.747
K-S Test Statistic	0.0959
5% K-S Critical Value	0.163

Anderson-Darling GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov GOF

Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	6.655	k star (bias corrected MLE)	5.989
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Theta hat (MLE)	0.0108	Theta star (bias corrected MLE)	0.012
nu hat (MLE)	386	nu star (bias corrected)	347.4
MLE Mean (bias corrected)	0.0719		
MLE Sd (bias corrected)	0.0294	95% Percentile of Chisquare (2kstar)	21

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0461
Maximum	0.165	Median	0.0375
SD	0.0328	CV	0.71
k hat (MLE)	1.985	k star (bias corrected MLE)	1.912
Theta hat (MLE)	0.0232	Theta star (bias corrected MLE)	0.0241
nu hat (MLE)	289.7	nu star (bias corrected)	279.2
MLE Mean (bias corrected)	0.0461	MLE Sd (bias corrected)	0.0334
95% Percentile of Chisquare (2kstar)	9.201	90% Percentile	0.0907
95% Percentile	0.111	99% Percentile	0.156

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hiferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.13	0.136	95% Approx. Gamma UPL	0.112	0.115
95% Gamma USL	0.219	0.243	95% UPL for Next 5 Observations	0.16	0.171

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0496	SD (KM)	0.0299
Variance (KM)	8.9345E-4	SE of Mean (KM)	0.00398
k hat (KM)	2.754	k star (KM)	2.65
nu hat (KM)	402.1	nu star (KM)	386.9
theta hat (KM)	0.018	theta star (KM)	0.0187

80% gamma percentile (KM)	0.0718	90% gamma percentile (KM)	0.0904
95% gamma percentile (KM)	0.108	99% gamma percentile (KM)	0.146

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.116	0.117	95% Approx. Gamma UPL	0.102	0.103
95% KM Gamma Percentile	0.1	0.101	95% Gamma USL	0.178	0.187

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.969	Shapiro Wilk GOF Test
10% Shapiro Wilk Critical Value	0.937	Detected Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.0855	Lilliefors GOF Test
10% Lilliefors Critical Value	0.148	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0499	Mean in Log Scale	-3.147
SD in Original Scale	0.0291	SD in Log Scale	0.548
95% UTL95% Coverage	0.127	95% BCA UTL95% Coverage	0.121
95% Bootstrap (%) UTL95% Coverage	0.121	95% UPL (t)	0.108
95% UPL for Next 5 Observations	0.16	95% UPL for Mean of 5 Observations	0.0656
90% Percentile (z)	0.0868	95% Percentile (z)	0.106
99% Percentile (z)	0.154	95% USL	0.235

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-3.16	95% KM UTL (Lognormal)95% Coverage	0.125
KM SD of Logged Data	0.545	95% KM UPL (Lognormal)	0.106
95% KM Percentile Lognormal (z)	0.104	95% KM USL (Lognormal)	0.23

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.049	Mean in Log Scale	-3.229
SD in Original Scale	0.0311	SD in Log Scale	0.689
95% UTL95% Coverage	0.155	95% UPL (t)	0.126

95% UPL for Next 5 Observations	0.206	95% UPL for Mean of 5 Observations	0.0673
90% Percentile (z)	0.0958	95% Percentile (z)	0.123
99% Percentile (z)	0.197	95% USL	0.335

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	72	95% UTL with 95% Coverage	0.225	
Approx, f used to compute achieved CC	1.895	Approximate Actual Confidence Coefficient achieved by UTL	0.885	
Approximate Sample Size needed to achieve specified CC	59	95% UPL	0.118	
	95% USL	0.225	95% KM Chebyshev UPL	0.181

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.

Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Sulfate

General Statistics

Total Number of Observations	73	Number of Missing Observations	0
Number of Distinct Observations	53	Number of Non-Detects	22
Number of Detects	51	Number of Distinct Non-Detects	3
Number of Distinct Detects	50	Minimum Non-Detect	0.129
Minimum Detect	0.273	Maximum Non-Detect	0.5
Maximum Detect	21.6	Percent Non-Detects	30.14%
Variance Detected	34.26	SD Detected	5.854
Mean Detected	5.173	SD of Detected Logged Data	1.312
Mean of Detected Logged Data	0.894		

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.977	d2max (for USL)	3.099
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.775
1% Shapiro Wilk P Value	6.071E-10
Lilliefors Test Statistic	0.262
1% Lilliefors Critical Value	0.143

Normal GOF Test on Detected Observations Only

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	3.682	KM SD	5.35
95% UTL95% Coverage	14.26	95% KM UPL (t)	12.66
95% KM UPL for Next 5 Observations	16.5	95% KM UPL for Mean of Next 5 Observations	7.804
90% KM Percentile (z)	10.54	95% KM Percentile (z)	12.48
99% KM Percentile (z)	16.13	95% KM USL	20.26

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	3.679	SD	5.389
95% UTL95% Coverage	14.34	95% UPL (t)	12.72
95% UPL for Next 5 Observations	16.59	95% UPL for Mean of Next 5 Observations	7.831
90% Percentile (z)	10.59	95% Percentile (z)	12.54
99% Percentile (z)	16.22	95% USL	20.38

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.884
5% A-D Critical Value	0.791
K-S Test Statistic	0.17
5% K-S Critical Value	0.129

Anderson-Darling GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov GOF

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.792	k star (bias corrected MLE)	0.759
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Theta hat (MLE)	6.529	Theta star (bias corrected MLE)	6.818
nu hat (MLE)	80.82	nu star (bias corrected)	77.4
MLE Mean (bias corrected)	5.173		
MLE Sd (bias corrected)	5.939	95% Percentile of Chisquare (2kstar)	5.018

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	3.617
Maximum	21.6	Median	1.03
SD	5.43	CV	1.501
k hat (MLE)	0.331	k star (bias corrected MLE)	0.327
Theta hat (MLE)	10.92	Theta star (bias corrected MLE)	11.07
nu hat (MLE)	48.34	nu star (bias corrected)	47.69
MLE Mean (bias corrected)	3.617	MLE Sd (bias corrected)	6.329
95% Percentile of Chisquare (2kstar)	2.907	90% Percentile	10.55
95% Percentile	16.1	99% Percentile	30.36

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hiferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	18.95	22.45	95% Approx. Gamma UPL	14.32	16.03
95% Gamma USL	44.96	64.63	95% UPL for Next 5 Observations	26.94	34.43

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	3.682	SD (KM)	5.35
Variance (KM)	28.63	SE of Mean (KM)	0.633
k hat (KM)	0.474	k star (KM)	0.463
nu hat (KM)	69.15	nu star (KM)	67.64
theta hat (KM)	7.774	theta star (KM)	7.948

80% gamma percentile (KM)	6.022	90% gamma percentile (KM)	10.12
95% gamma percentile (KM)	14.53	99% gamma percentile (KM)	25.47

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	16.41	17.54	95% Approx. Gamma UPL	12.81	13.22
95% KM Gamma Percentile	12.45	12.8	95% Gamma USL	35.78	43.6

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.921
10% Shapiro Wilk P Value	0.00228
Lilliefors Test Statistic	0.128
10% Lilliefors Critical Value	0.113

Shapiro Wilk GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors GOF Test

Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	3.681	Mean in Log Scale	0.0714
SD in Original Scale	5.389	SD in Log Scale	1.734
95% UTL95% Coverage	33.14	95% BCA UTL95% Coverage	16.22
95% Bootstrap (%) UTL95% Coverage	16.4	95% UPL (t)	19.71
95% UPL for Next 5 Observations	68.45	95% UPL for Mean of 5 Observations	4.085
90% Percentile (z)	9.915	95% Percentile (z)	18.62
99% Percentile (z)	60.71	95% USL	231.9

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.142	95% KM UTL (Lognormal)95% Coverage	27.18
KM SD of Logged Data	1.598	95% KM UPL (Lognormal)	16.84
95% KM Percentile Lognormal (z)	15.98	95% KM USL (Lognormal)	163.3

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	3.679	Mean in Log Scale	0.133
SD in Original Scale	5.389	SD in Log Scale	1.625

95% UTL95% Coverage	28.36	95% UPL (t)	17.43
95% UPL for Next 5 Observations	55.95	95% UPL for Mean of 5 Observations	3.991
90% Percentile (z)	9.159	95% Percentile (z)	16.53
99% Percentile (z)	50	95% USL	175.5

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	72	95% UTL with95% Coverage	21.6
Approx, f used to compute achieved CC	1.895	Approximate Actual Confidence Coefficient achieved by UTL	0.885
Approximate Sample Size needed to achieve specified CC	59	95% UPL	15.75
	95% USL 21.6	95% KM Chebyshev UPL	27.16

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

TDS

General Statistics

Total Number of Observations	73	Number of Missing Observations	0
Number of Distinct Observations	60	Number of Non-Detects	1
Number of Detects	72	Number of Distinct Non-Detects	1
Number of Distinct Detects	59	Minimum Non-Detect	2.38
Minimum Detect	2	Maximum Non-Detect	2.38
Maximum Detect	143	Percent Non-Detects	1.37%
Variance Detected	1353	SD Detected	36.79
Mean Detected	55.27	SD of Detected Logged Data	0.834
Mean of Detected Logged Data	3.74		

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.977	d2max (for USL)	3.099
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.901
1% Shapiro Wilk P Value	4.0666E-6
Lilliefors Test Statistic	0.183
1% Lilliefors Critical Value	0.121

Normal GOF Test on Detected Observations Only

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	54.54	KM SD	36.81
95% UTL95% Coverage	127.3	95% KM UPL (t)	116.3
95% KM UPL for Next 5 Observations	142.7	95% KM UPL for Mean of Next 5 Observations	82.89
90% KM Percentile (z)	101.7	95% KM Percentile (z)	115.1
99% KM Percentile (z)	140.2	95% KM USL	168.6

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	54.53	SD	37.08
95% UTL95% Coverage	127.8	95% UPL (t)	116.7
95% UPL for Next 5 Observations	143.3	95% UPL for Mean of Next 5 Observations	83.09
90% Percentile (z)	102	95% Percentile (z)	115.5
99% Percentile (z)	140.8	95% USL	169.4

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.664
5% A-D Critical Value	0.764
K-S Test Statistic	0.0874
5% K-S Critical Value	0.106

Anderson-Darling GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov GOF

Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.985	k star (bias corrected MLE)	1.912
Theta hat (MLE)	27.84	Theta star (bias corrected MLE)	28.91
nu hat (MLE)	285.9	nu star (bias corrected)	275.3
MLE Mean (bias corrected)	55.27		
MLE Sd (bias corrected)	39.97	95% Percentile of Chisquare (2kstar)	9.2

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	2	Mean	54.59
Maximum	143	Median	41.4
SD	36.99	CV	0.678
k hat (MLE)	1.887	k star (bias corrected MLE)	1.818
Theta hat (MLE)	28.93	Theta star (bias corrected MLE)	30.02
nu hat (MLE)	275.4	nu star (bias corrected)	265.4
MLE Mean (bias corrected)	54.59	MLE Sd (bias corrected)	40.48
95% Percentile of Chisquare (2kstar)	8.892	90% Percentile	108.6
95% Percentile	133.5	99% Percentile	189

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	157	166.5	95% Approx. Gamma UPL	134.2	139.9
95% Gamma USL	265.4	300.7	95% UPL for Next 5 Observations	193.1	209.7

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	54.54	SD (KM)	36.81
Variance (KM)	1355	SE of Mean (KM)	4.338
k hat (KM)	2.196	k star (KM)	2.114
nu hat (KM)	320.5	nu star (KM)	308.7

theta hat (KM)	24.84	theta star (KM)	25.79
80% gamma percentile (KM)	81.11	90% gamma percentile (KM)	104.7
95% gamma percentile (KM)	127.1	99% gamma percentile (KM)	176.7

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	158	168.5	95% Approx. Gamma UPL	134.9	141.3
95% KM Gamma Percentile	132.5	138.5	95% Gamma USL	268.1	306.3

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Approximate Test Statistic	0.929
10% Shapiro Wilk P Value	5.4125E-4
Lilliefors Test Statistic	0.0939
10% Lilliefors Critical Value	0.0955

Shapiro Wilk GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors GOF Test

Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	54.59	Mean in Log Scale	3.713
SD in Original Scale	36.98	SD in Log Scale	0.858
95% UTL95% Coverage	223.5	95% BCA UTL95% Coverage	127
95% Bootstrap (%) UTL95% Coverage	130	95% UPL (t)	172.8
95% UPL for Next 5 Observations	319.9	95% UPL for Mean of 5 Observations	79.37
90% Percentile (z)	123.1	95% Percentile (z)	168
99% Percentile (z)	301.5	95% USL	585

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	3.698	95% KM UTL (Lognormal)95% Coverage	237
KM SD of Logged Data	0.895	95% KM UPL (Lognormal)	181.2
95% KM Percentile Lognormal (z)	176	95% KM USL (Lognormal)	647

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	54.53	Mean in Log Scale	3.691
SD in Original Scale	37.08	SD in Log Scale	0.927
95% UTL95% Coverage	250.6	95% UPL (t)	189.8
95% UPL for Next 5 Observations	369.4	95% UPL for Mean of 5 Observations	81.85
90% Percentile (z)	131.5	95% Percentile (z)	184.2
99% Percentile (z)	346.4	95% USL	709.2

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs (no distinction made between detects and nondetects)

Order of Statistic, r	72	95% UTL with95% Coverage	143
Approx, f used to compute achieved CC	1.895	Approximate Actual Confidence Coefficient achieved by UTL	0.885
Approximate Sample Size needed to achieve specified CC	59	95% UPL	123.6
95% USL	143	95% KM Chebyshev UPL	216.1

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Appendix F

Second Semiannual Detection Monitoring Program Statistical Evaluation



DOMINION ENERGY SOUTH CAROLINA

COPE STATION CLASS III LANDFILL

SEMIANNUAL DETECTION MONITORING

ORANGEBURG COUNTY, SOUTH CAROLINA

CCR GROUNDWATER DETECTION MONITORING STATISTICAL ANALYSIS REPORT

For the

October 2023 Sampling Event

January 5, 2024



A handwritten signature in blue ink, reading "Joyce E. Peterson".

Joyce Peterson, P.E.
Senior Environmental Engineer

A handwritten signature in blue ink, reading "Richard A. Mayer Jr.".

Richard A. Mayer Jr., P.G.
Project Manager

*TRC Environmental Corporation | Dominion Energy South Carolina
Cope Station Class III Landfill – Detection Monitoring*

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Table of Contents

Statistical Analysis Report.....	1
Background.....	1
Groundwater Sampling.....	1
Statistical Analysis	1

List of Tables

Table 1	Background Threshold Values
Table 2	October 2023 Downgradient Results and Potential SSIs

List of Appendices

Appendix A	Baseline Statistical Evaluation Report
Appendix B	Background Data Set for October 2023 Semiannual Detection Monitoring Event

Statistical Analysis Report

Background

In January 2023, Dominion Energy South Carolina (DESC) installed four new groundwater monitoring wells downgradient along the northern and eastern edge of the Cope Station Class III Landfill. The new monitoring wells were sampled from January 2023 through August 2023, to collect eight rounds of background monitoring data. To ensure the groundwater monitoring well network meets the requirements of 40 CFR 257.91, the monitoring well network was revised and certified in September 2023 (TRC, 2023a) to include the following monitoring wells:

- Background monitoring wells – AS-LF-01, AS-LF-02, and MW-LF-01.
- Downgradient monitoring wells – MW-LF-03, MW-LF-04, MW-LF-07, MW-LF-08, and MW-LF-09.

TRC Environmental Corporation (TRC) conducted a baseline statistical evaluation of the CCR Rule Appendix III and Appendix IV constituents in November 2023 for the revised monitoring well network. A copy of the Baseline Statistical Evaluation Report is provided in **Appendix A**.

Groundwater Sampling

TRC Environmental Corporation (TRC) is providing this Statistically Significant Increases (SSI) notification for the Cope Station Class III Landfill for the 2nd Semiannual 2023 Detection Monitoring Program event. Samples were collected on October 2, 2023. The final laboratory analytical data package for the event was received on October 19, 2023, and the data validation report was received on November 1, 2023.

Statistical Analysis

Statistically Significant Increases (SSI) above background concentrations include the following:

- MW-LF-07: calcium, fluoride, pH, and total dissolved solids (TDS)
- MW-LF-08: pH

In general accordance with the Statistical Analysis Plan (OBG, 2017) for Detection Monitoring, the evaluation of potential SSIs was conducted using prediction limits to compare data from the background set of monitoring wells to the most recent results from the downgradient monitoring wells. The statistical calculations have been conducted using United States Environmental Protection Agency's (USEPA's) ProUCL (v.5.2) software. **Table 1** presents basic statistical information regarding the data sets and the calculated background threshold values (BTVs). **Table 2** presents the data set for the October 2023 Detection Monitoring Program event and highlights results that are potential SSIs. **Appendix B** presents the background data used for the October 2023 Detection Monitoring Program event.

Table 1

Background Threshold Values

Table 1 Background Threshold Values

CONSTITUENT	NUMBER of RESULTS	PERCENT DETECTED	DISTRIBUTION	TREND	BACKGROUND THRESHOLD VALUE	BASIS
Boron (µg/L)	24	100	Normal	N/A	35.4	95% UPL, k=20
Calcium (µg/L)	24	100	Normal	N/A	5,860	95% UPL, k=20
Chloride (mg/L)	24	100	Normal	N/A	13.5	95% UPL, k=20
Fluoride (mg/L)	24	67	Normal	N/A	0.11	95% UPL, k=20
pH (S.U.)	24	100	Normal	N/A	4.0 – 4.9	95% UPL, k=20
Sulfate (mg/L)	24	100	Nonnormal	N/A	18.9	95% USL
TDS (mg/L)	24	75	Normal	N/A	31.9	95% UPL, k=20

pH expressed in standard units (S.U.).

TDS = Total dissolved solids.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

N/A = Not applicable.

UPL = Upper prediction limit.

USL = Upper statistical limit.

k = Number of independent groups.

Table 2
October 2023
Downgradient Results and Potential SSIs

Table 2 October 2023 Downgradient Results and Potential SSIs

WELL	CONSTITUENT / BTV / RESULT						
	BORON (µg/L)	CALCIUM (µg/L)	CHLORIDE (mg/L)	FLUORIDE (mg/L)	pH (S.U.)	SULFATE (mg/L)	TDS (mg/L)
	35.4	5,860	13.5	0.11	4.0 – 4.9	18.9	31.9
BACKGROUND WELLS							
MW-LF-01	10.7 J	2,450	12.9	0.0695 J	4.34	0.645	7.00 J
AS-LF-01	19.7	1,780	2.58	0.0571 J	4.42	8.01	< 2.38
AS-LF-02	29.2	3,830	6.63	0.0776 J	4.41	11.5	19.0
DOWNGRAIENT WELLS							
MW-LF-03	9.83 J	1,370	3.09	< 0.0330	4.64	0.575	< 2.38
MW-LF-04	11.6 J	1,340	3.52	< 0.0330	4.62	0.610	< 2.38
MW-LF-07	9.80 J	21,300	6.74	0.167	6.52	0.986	63.0
MW-LF-08	11.0 J	5,160	9.95	0.0626 J	5.00	0.224 J	21.0
MW-LF-09	8.75 J	698	2.74	< 0.0330	4.74	0.587	< 2.38

Shaded cells indicate a statistically significant increase (SSI).

BTV = Background threshold values.

pH expressed in standard units (S.U.).

TDS = Total dissolved solids.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

J Estimated concentration.

< Result less than the indicated detection limit.

Appendix A

Baseline Statistical Evaluation Report



DOMINION ENERGY SOUTH CAROLINA

COPE GENERATING STATION

CLASS III LANDFILL

ORANGEBURG COUNTY, SOUTH CAROLINA

BASELINE STATISTICAL EVALUATION REPORT

For the

January - August 2023 Baseline Sampling Events

December 15, 2023



A handwritten signature in blue ink, reading "Joyce E. Peterson".

Joyce Peterson, P.E.
Senior Environmental Engineer

A handwritten signature in blue ink, reading "Richard A. Mayer Jr.".

Richard A. Mayer Jr., P.G.
Project Manager

*TRC Environmental Corporation | Dominion Energy South Carolina
Cope Station Class III Landfill – New Baseline Statistical Evaluation*

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Table of Contents

1.	Background.....	1
1.1	Site Location.....	1
1.2	Site History.....	1
1.3	Groundwater Monitoring Well Network.....	1
2.	Baseline Statistical Evaluation.....	3
2.1	Appendix III Results.....	4
2.2	Appendix IV Results.....	5
3.	References.....	7

List of Tables

Table 1	Revised CCR Rule Groundwater Monitoring Well Network
Table 2	Groundwater Quality Monitoring Constituents
Table 3	Appendix III Data Set Details and Background Threshold Values
Table 4	Appendix IV Data Set Details and Preliminary Groundwater Protection Standards

List of Figures

Figure 1	Site Location Map
Figure 2	EPA CCR Rule Compliance Monitoring Wells
Figure 3	Groundwater Potentiometric Map – March 7, 2023

List of Appendices

Appendix A	Baseline Data
Appendix B	Summary of General Statistics
Appendix C	Background Evaluation ProUCL Outputs

Section 1

Background

Dominion Energy South Carolina (DESC) owns and operates the Cope Generating Station (Station) located near Cope, in Orangeburg County, South Carolina. Coal combustion residuals (CCR) are produced as part of the electrical generation operations and is disposed of in the Class III Industrial Landfill (Unit). The CCR Unit is managed in accordance with the South Carolina Department of Health and Environmental Control (SCDHEC) Class III Landfill Permit (Permit No. LF3-00028) and the national criteria established by the United States Environmental Protection Agency (EPA) CCR Rule. Pursuant to 40 CFR §257.94(b) of this rule, eight independent samples from each background and downgradient well must be collected and analyzed from the constituents listed in Appendix III and Appendix IV. This Report provides information for baseline data evaluation of the new monitoring well network for the Unit.

1.1 Site Location

The Station is located at 405 Teamwork Road in Orangeburg County, South Carolina (**Figure 1**). The Station is located approximately 2 miles southwest of Cope, South Carolina. The Unit is located on the northwest portion of the Station property approximately 3,000 feet from the generating plant.

1.2 Site History

The facility began operations in 1996 and operates a single 417-megawatt coal-fired unit. The Station consists of Class II and III landfills and a landfill leachate pond. The Unit is currently regulated under the CCR rule, the Class II Landfill is closed and regulated under an Industrial Solid Waste Landfill permit issued by South Carolina Department of Health and Environmental Control (SCDHEC), and the Landfill Leachate Pond is monitored and permitted under a National Pollutant Discharge System (NPDES) permit issued by SCDHEC.

1.3 Groundwater Monitoring Well Network

Pursuant to 40 CFR §257.91(a)(2), the groundwater monitoring well network should accurately represent the quality of groundwater passing the waste boundary of the Unit and monitor all potential contaminant pathways. From January 2023 through September 2023, TRC conducted an evaluation of the CCR Groundwater Monitoring Well Network to determine if it satisfied the CCR Rule for horizontal and vertical placements for monitoring groundwater upgradient and at the waste boundary of the Unit. The certified monitoring well network for the Unit consisted of the following:

- Background monitoring wells – AS-LF-01, AS-LF-02, MW-BG-06, MW-BG-16, and MW-LF-01.
- Downgradient monitoring wells – MW-LF-02, MW-LF-03, MW-LF-04, MW-LF-05, and MW-LF-06.

In January 2023, DESC installed four new groundwater monitoring wells downgradient along the northern and eastern edge of the Unit. The new monitoring wells were sampled from January 2023 through August 2023, to collect eight rounds of background monitoring data. To ensure the groundwater monitoring well network meets the requirements of 40 CFR 257.91, the monitoring well network was updated and certified in September 2023 (TRC, 2023) to include the following monitoring wells:

- Background monitoring wells – AS-LF-01, AS-LF-02, and MW-LF-01.
- Downgradient monitoring wells – MW-LF-03, MW-LF-04, MW-LF-07, MW-LF-08, and MW-LF-09.

Details of the CCR Groundwater Monitoring Well Network are provided in **Table 1**. The revised monitoring well network is presented on **Figure 2**: CCR Rule Compliance Monitoring Well Network. A groundwater potentiometric map from March 2023 is included as **Figure 3**: Groundwater Potentiometric Map – March 7, 2023.

Table 1
Revised CCR Rule Groundwater Monitoring Well Network

LOCATION	RELATIVE LOCATION	WELL DIAMETER (IN.)	BOTTOM OF SCREEN (FT-BGS)	SCREEN LENGTH (FT)
MW-LF-01	Upgradient	2	15	10
AS-LF-01	Upgradient	2	20	10
AS-LF-02	Upgradient	2	20	10
MW-LF-03	Downgradient	2	28	10
MW-LF-04	Downgradient	2	28	10
MW-LF-07	Downgradient	2	40	10
MW-LF-08	Downgradient	2	38	10
MW-LF-09	Downgradient	2	30	10

Section 2

Baseline Statistical Evaluation

Groundwater samples were collected from the newly installed downgradient monitoring wells on a monthly basis from January 2023 through August 2023, for a total of eight baseline sampling events. The groundwater samples were submitted to GEL Laboratories, LLC in Charleston, South Carolina, for analysis of the CCR Rule Appendix III and Appendix IV constituents. Environmental Standards, Inc., conducted quality assurance reviews of the analytical results and managed the data in an EQulS database. A summary table of the baseline sampling results is provided in **Appendix A. Table 2** lists the Appendix III and Appendix IV constituents.

Table 2
Groundwater Quality Monitoring Constituents

APPENDIX III CONSTITUENTS	APPENDIX IV CONSTITUENTS	
Boron	Antimony	Lead
Calcium	Arsenic	Lithium
Chloride	Barium	Mercury
Fluoride	Beryllium	Molybdenum
Field pH	Cadmium	Radium 226/228
Sulfate	Chromium	Selenium
Total Dissolved Solids (TDS)	Cobalt	Thallium
	Fluoride	

The following procedure was conducted to establish new background concentrations for detection monitoring of the Unit. Statistical calculations and evaluations were conducted using US EPA’s ProUCL (v.5.2) Software. The evaluation procedures were conducted separately for Appendix III and Appendix IV constituents.

- The data for all wells were observed for detection frequency, potential outliers, and missing data.
- General statistical parameters were evaluated for Appendix III and IV (ProUCL outputs for these are provided in **Appendix B**).
- The Appendix III data for background wells MW-LF-01, AS-LF-01, and AS-LF-02 were evaluated for underlying data distribution (ProUCL outputs are provided in **Appendix C**).

- Based on underlying data distribution, ProUCLs Background Threshold Value function was used to calculate background concentrations for use in subsequent statistical evaluations of downgradient groundwater monitoring data.
- Statistical evaluations for Appendix IV constituents were performed for data sets with more than 50 percent detections.

The preferred statistical method for background comparisons being conducted by DESC is the upper prediction limit (UPL). UPLs are calculated for k=20 future comparisons (five downgradient monitoring wells, four subsequent detection monitoring events) when the data set meets the requirements for parametric statistical evaluation. In accordance with the Statistical Evaluation Plan, statistical calculations for data sets with censored (nondetect) results are conducted as follows:

- For data sets with between 50 and 100 percent detected concentrations, the Kaplan-Meier method is used for statistical calculations.
- For data sets with fewer than 50 percent detected concentrations, nonparametric statistical methods are employed.
- For data sets with 100 percent nondetect values in the background data set, the double quantification rule is employed. A downgradient detection above the practical quantification limit in two consecutive groundwater monitoring events is deemed to be an SSI for that constituent.

Selection of the background threshold value for a background data set with at least 50 percent detected concentrations is based on the following hierarchy:

- Normal
- Gamma
- Lognormal
- Nonnormal (nonparametric)
- When nonparametric statistics are necessary, the upper statistical limit (USL) is used to compensate in part for the lower statistical power of the nonparametric statistical methods.

2.1 Appendix III Results

Five of the Appendix III constituents had 100 percent detections for all five monitoring wells; the background data sets had some nondetect results for fluoride and TDS. Q-Q plots were generated for the Appendix III constituents, and potential outlier values were observed for calcium, fluoride, sulfate, and TDS. The ProUCL outlier function was used to test whether the potential outlier values were statistically significant at the 1 percent level of significance. Based on the results, the outlier values were removed from the data sets before evaluating the background threshold value. The results of these tests are provided in **Appendix C**.

For calculation of background threshold values, the data sets for the three upgradient monitoring wells, MW-LF-01, AS-LF-01, and AS-LF-02, were combined. **Table 3** provides a summary of the statistical results for of the background data sets for Appendix III constituents. The ProUCL outputs are provided in **Appendix C**.

Table 3
Appendix III Data Set Details and Background Threshold Values

CONSTITUENT	PERCENT DETECTED	DISTRIBUTION	BACKGROUND THRESHOLD VALUE	BASIS
Boron (µg/L)	100	Normal	35.4	95% UPL, k=20
Calcium (µg/L)	100	Normal	5,860	95% UPL, k=20
Chloride (mg/L)	100	Normal	13.5	95% UPL, k=20
Fluoride (mg/L)	67	Normal	0.11	95% UPL, k=20
pH (s.u.)	100	Normal	4.0 – 4.9	95% UPL, k=20
Sulfate (mg/L)	100	Nonnormal	18.9	95% USL ^[1]
TDS (mg/L)	75	Normal	31.9	95% UPL, k=20

[1] Upper statistical limit

2.2 Appendix IV Results

Baseline sampling included the 15 constituents included in Appendix IV to the CCR rule. The Appendix IV results for the background wells in the new monitoring well network were used to estimate what GWPS would likely be applied in the event that the Unit were to transition to an assessment monitoring program. As set forth in the CCR rule, GWPS default to values established in the CCR rule unless background concentrations exceed those values. **Appendix A** provides a table of Appendix IV analytical results for both the upgradient and downgradient monitoring wells in the new monitoring well network.

Of the 15 Appendix IV constituents, five were not detected in background baseline samples and another six were detected in fewer than 50 percent of the background samples. For the non-detected constituents, the default GWPS is selected as the GWPS without further evaluation. For the constituents detected in fewer than 50 percent of the analyses, the maximum detected concentration is used for the background concentration (non-parametric background limit). Statistical evaluation was conducted for the remaining four Appendix IV constituents.

Table 4 provides a summary of the statistical evaluation of the Appendix IV constituents. The same methods were used to evaluate the Appendix IV data as the Appendix III data. The UPLs for Appendix IV

parameters were calculated for a single future event. The ProUCL outputs for the two background concentration evaluations are provided in **Appendix B** and **Appendix C**.

Table 4
Appendix IV Data Set Details and Preliminary Groundwater Protection Standards

CONSTITUENT	PERCENT DETECTED	MAXIMUM DETECTED	DEFAULT GWPS ^[1]	BACKGROUND CONCENTRATION	PRELIMINARY GWPS
Antimony	0	NA	6	NC	6
Arsenic	4	2.17 J	10	5	10
Barium	100	44.6	2000	2	2000
Beryllium	0	NA	4	NC	4
Cadmium	4	0.034 J	5	0.1	5
Chromium	4	1.27 J	100	3	100
Cobalt	100	8.56 ^[2]	6	1	6
Fluoride	71	0.228	4	0.120	4
Lead	0	NA	15	NC	15
Lithium	0	NA	40	NC	40
Mercury	4	0.078 J	2	0.2	2
Molybdenum	0	NA	100	NC	100
Radium 226/228	96	5.81	5.0	4.96	5.0
Selenium	4	3.42 J	50	5	50
Thallium	21	0.216 J	2	0.5	2

Radium 226/288 concentrations expressed in pCi/L (pico-Curies/liter)

Background and GWPS concentrations (except Radium 226/228) expressed in µg/L

J Quantitation is approximate due to limitations identified during data validation.

NA not analyzed

NC not calculated – 100% nondetect

[1] 40 CFR 257.95(h)

[2] The maximum cobalt concentration was an outlier, which was removed from the data set.

Section 3

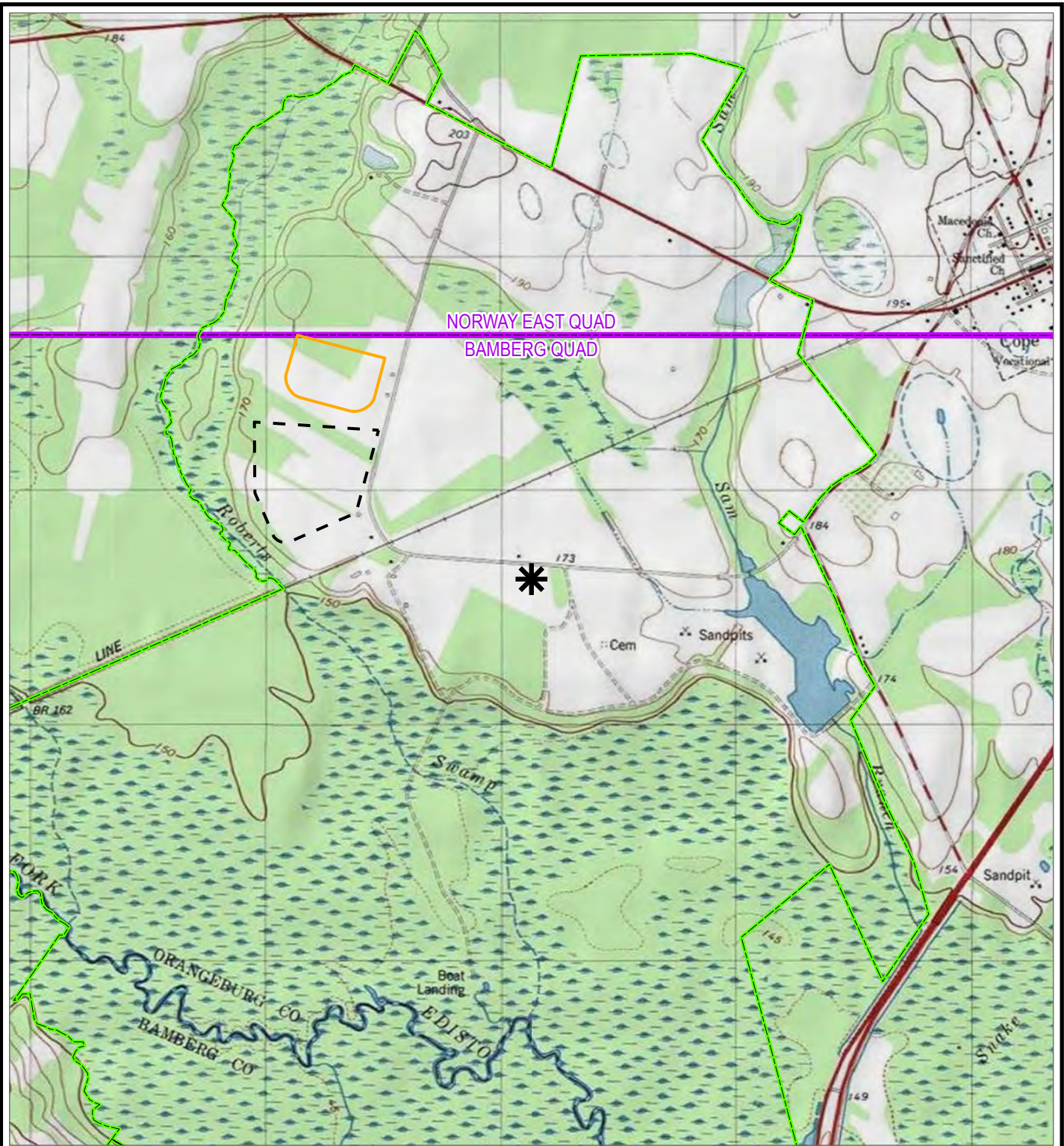
References






TRC 2022. Technical Memorandum to DESC. *Evaluation of CCR Well Network – Cope Station Class III Industrial Landfill*. TRC, July 7, 2022

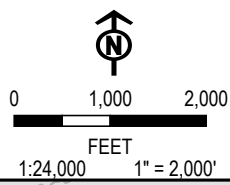
TRC 2023. Class III Landfill Groundwater Monitoring System Certification per 40 CFR 257.91 (f), Cope Generating Station, Cope, South Carolina. TRC, September 29, 2023.


Figures

COORDINATE SYSTEM: NAD 1983 STATEPLANE SOUTH CAROLINA FIPS 3900 FEET, MAP ROTATION: 0
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-  SITE LOCATION
-  CLASS III LANDFILL
-  CLASS II LANDFILL
-  PROPERTY BOUNDARY
-  7.5' USGS QUADRANGLE BOUNDARY



PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE:		SITE LOCATION MAP	
DRAWN BY:	H. BEST	PROJ. NO.:	416559.0007.0000
CHECKED BY:	A. KAILAS	FIGURE 1	
APPROVED BY:	J. YONTS		
DATE:	AUGUST 2023		
		50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
FILE:		2023_FIGURES	

BASE MAP: USGS COLOR ORTHO IMAGERY
 DATA SOURCES: TRC

Coordinate System: NAD 1983 StatePlane South Carolina FIPS 3800 Feet, Map Rotation: 0
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LEGEND

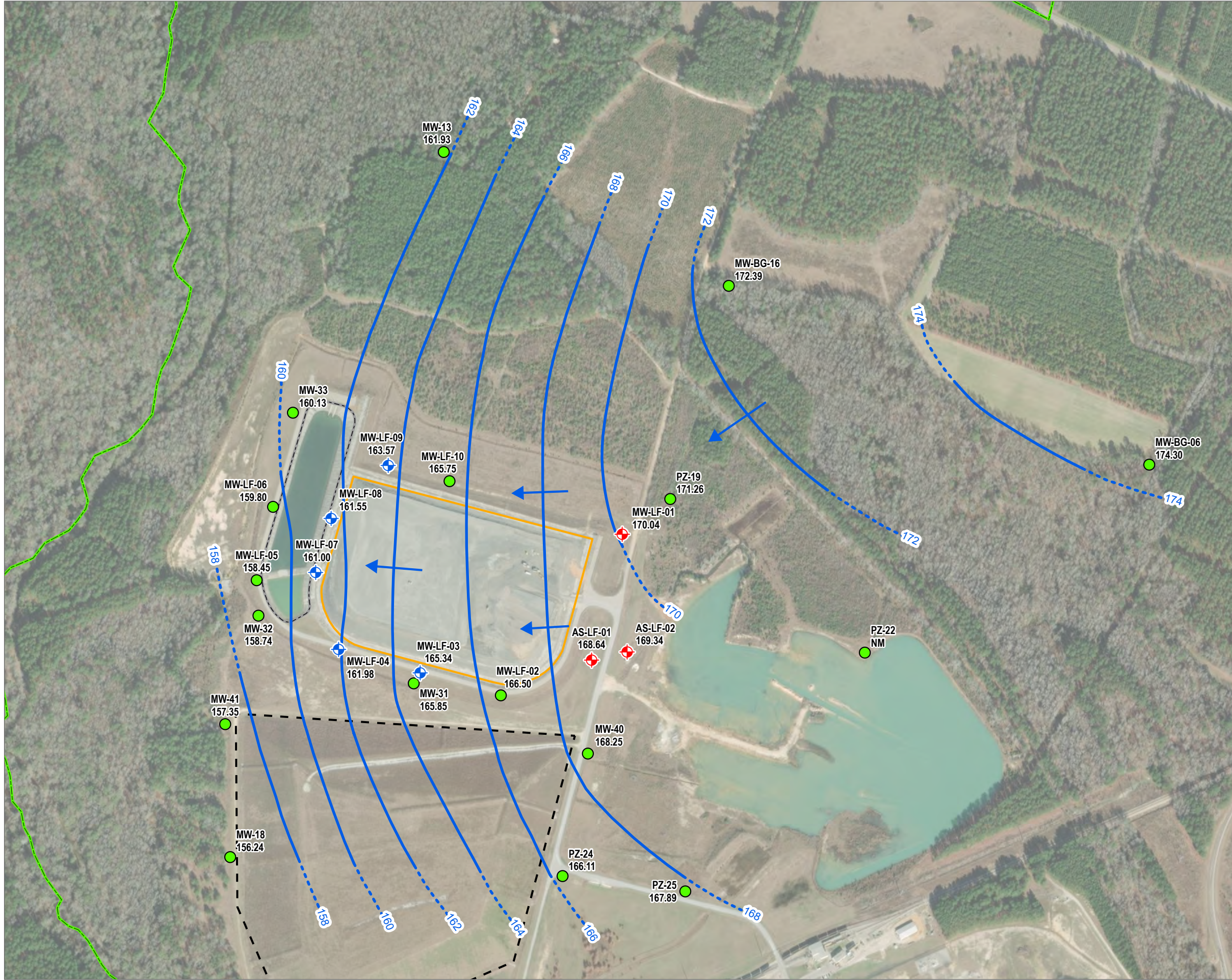
- CCR BACKGROUND MONITORING WELL
- CCR DOWNGRADIENT MONITORING WELL
- EVENT PIEZOMETER
- CLASS III LANDFILL
- CLOSED CLASS II LANDFILL
- CLASS III LANDFILL POND
- PROPERTY BOUNDARY

NOTES:
 1. AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.

1:6,000
 1" = 500'
 0 250 500 FEET

PROJECT:		DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE:		CCR RULE COMPLIANCE MONITORING WELL NETWORK	
DRAWN BY:	H. BEST	PROJ. NO.:	416559.0007.0000
CHECKED BY:	A. KAILAS	FIGURE 2	
APPROVED BY:	J. YONTS		
DATE:	SEPTEMBER 2023		
		50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
		FILE: 2023_Figures.aprx	

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LEGEND

- CCR BACKGROUND MONITORING WELL
- CCR DOWNGRADIENT MONITORING WELL
- EVENT PIEZOMETER
- CLASS III LANDFILL
- CLOSED CLASS II LANDFILL
- CLASS III LANDFILL POND
- PROPERTY BOUNDARY
- WATER TABLE ELEVATION IN FEET ABOVE MEAN SEA LEVEL (2' CONTOUR INTERVALS) - DASHED WHERE INFERRED
- APPROXIMATE GROUNDWATER FLOW DIRECTION

169.34 WATER ELEVATION (FT. MSL)

NOTES:

- AERIAL IMAGE FROM ESRI WORLD IMAGERY DATED JANUARY 2020.
- NM = NOT MEASURED.

1:6,000
 1" = 500'

0 250 500 FEET

PROJECT: DESC COPE STATION CLASS III LANDFILL COPE, SOUTH CAROLINA	
TITLE: GROUNDWATER POTENTIOMETRIC MAP MARCH 7, 2023	
DRAWN BY: H. BEST	PROJ. NO.: 416559.0007.0000
CHECKED BY: A. KAILAS	FIGURE 3
APPROVED BY: J. YONTS	
DATE: SEPTEMBER 2023	
50 INTERNATIONAL DRIVE PATEWOOD PLAZA THREE, SUITE 150 GREENVILLE, SC 29615 PHONE: 864.281.0030	
FILE:	2023_Figures.aprx

Appendix A

Baseline Data

Baseline Data - Appendix III Constituents

WELL	DATE	BORON (µg/L)	CALCIUM (µg/L)	CHLORIDE (mg/L)	FLUORIDE (mg/L)	FIELD pH (S.U.)	SULFATE (mg/L)	TDS (mg/L)
BACKGROUND WELLS								
AS-LF-01	1/18/2023	16.0	4,470	3.79	0.0791 J	4.80	18.9	16.0
	2/14/2023	13.6 J	2,670	2.56	0.0577 J	4.50	13.9	24.0 J
	3/9/2023	9.13 J	3,570	3.66	0.0992 J	4.57	15.0	11.0
	4/11/2023	15.7	2,700	1.94	0.0606 J	4.44	15.0	5.00 J
	5/22/2023	14.1 J	2,010	3.05	0.0620 J	4.43	9.33	8.00 J
	6/14/2023	15.6	11,200	9.22	0.228	4.21	37.4	54.0
	7/18/2023	16.2	2,430	3.35	< 0.0330	4.36	9.49	3.00
	8/15/2023	16.6	2,260	3.02	0.0426 J	4.30	12.8	5.00
AS-LF-02	1/18/2023	20.2	3,300	7.39	0.0642 J	4.76	14.1	13.0
	2/14/2023	17.2	3,660	6.39	0.0729 J	4.54	14.1	25.0
	3/9/2023	12.2 J	3,280	8.05	0.0815 J	4.46	10.3	12.0
	4/11/2023	20.3	4,350	6.09	0.0649 J	4.52	17.1	8.00 J
	5/22/2023	23.1	4,520	5.55	0.0586 J	4.44	18.7	18.0
	6/14/2023	22.4	3,820	6.60	0.0550 J	4.45	15.6	21.0
	7/18/2023	27.2	3,960	6.16	< 0.0330	4.43	12.6	12.0
	8/15/2023	28.3	3,670	5.47	0.0760 J	4.42	16.5	12.0
MW-LF-01	1/18/2023	7.37 J	2,090	8.32	< 0.0330	4.75	0.418	< 2.38
	2/14/2023	6.78 J	2,070	7.54	< 0.0330	4.53	0.260 J	5.00 J
	3/7/2023	6.98 J	1,980	7.60	< 0.0566	4.55	0.269 J	< 2.38
	4/12/2023	7.23 J	2,090	8.37	0.0488 J	4.39	0.240 J	< 2.38
	5/22/2023	7.07 J	1,940	7.84	< 0.0330	4.42	0.304 J	< 2.38
	6/14/2023	8.12 J	1,980	8.88	0.0394 J	4.40	0.579	5.00 J
	7/18/2023	9.22 J	2,020	8.83	< 0.0330	4.31	0.241 J	< 2.38
	8/15/2023	7.83 J	1,950	8.75	0.0344 J	4.27	0.856	7.00 J

Baseline Data - Appendix IV Constituents

WELL	DATE	ANTIMONY (µg/L)	ARSENIC (µg/L)	BARIUM (µg/L)	BERYLLIUM (µg/L)	CADMIUM (µg/L)	CHROMIUM (µg/L)	COBALT (µg/L)	FLUORIDE (mg/L)	LEAD (µg/L)	LITHIUM (µg/L)	MERCURY (µg/L)	MOLYBDENUM (µg/L)	RADIUM-226/228 (pCi/L)	SELENIUM (µg/L)	THALLIUM (µg/L)
BACKGROUND WELLS																
AS-LF-01	1/18/2023	< 0.600	< 1.66	22.0	< 0.200	< 0.0300	< 1.00	0.727 J	0.0791 J	< 0.500	< 2.00	< 0.0670	< 0.167	2.37 J	< 1.50	< 0.125
	2/14/2023	< 0.600	< 1.66	19.0	< 0.200	< 0.0300	< 1.00	0.363 J	0.0577 J	< 0.500	< 2.00	< 0.0670	< 0.169	2.59 J	< 1.50	0.183 J
	3/9/2023	< 0.600	< 1.66	18.4	< 0.200	< 0.0300	< 1.00	1.21	0.0992 J	< 0.500	< 2.00	< 0.0670	< 0.167	2.44 J	< 1.50	0.184 J
	4/11/2023	< 0.600	< 1.66	18.7	< 0.200	< 0.0300	< 1.00	0.305 J	0.0606 J	< 0.500	< 2.00	< 0.101	< 0.167	1.93 J	< 1.50	< 0.125
	5/22/2023	< 0.600	< 1.66	15.1	< 0.200	< 0.0300	< 1.00	0.330 J	0.0620 J	< 0.500	< 2.00	< 0.0670	< 0.167	3.68	< 1.50	0.216 J
	6/14/2023	< 0.600	< 1.66	44.6	< 0.200	0.0340 J	< 1.00	8.56	0.228	< 0.500	< 2.00	0.0780 J	< 0.453	3.58	3.42 J	0.172 J
	7/18/2023	< 0.600	< 1.66	17.0	< 0.200	< 0.0300	< 1.00	0.556 J	< 0.0330	< 0.500	< 2.00	< 0.0670	< 0.167	2.74 J	< 1.50	0.129 J
	8/15/2023	< 0.600	< 1.66	15.8	< 0.200	< 0.0300	< 1.00	0.558 J	0.0426 J	< 0.500	< 2.00	< 0.0670	< 0.167	3.04 J	< 1.50	< 0.125
AS-LF-02	1/18/2023	< 0.600	2.17 J	30.6	< 0.200	< 0.0300	1.27 J	0.667 J	0.0642 J	< 0.500	< 2.00	< 0.0670	< 0.167	3.18 J	< 1.50	< 0.125
	2/14/2023	< 0.600	< 1.66	28.0	< 0.200	< 0.0300	< 1.00	0.569 J	0.0729 J	< 0.500	< 2.00	< 0.0670	< 0.167	3.99	< 1.50	< 0.125
	3/9/2023	< 0.600	< 1.66	28.5	< 0.200	< 0.0300	< 1.00	0.679 J	0.0815 J	< 0.500	< 2.00	< 0.0670	< 0.167	2.45 J	< 1.50	< 0.125
	4/11/2023	< 0.600	< 1.66	28.2	< 0.200	< 0.0300	< 1.00	0.587 J	0.0649 J	< 0.500	< 2.00	< 0.0990	< 0.167	2.26 J	< 1.50	< 0.125
	5/22/2023	< 0.600	< 1.66	29.5	< 0.200	< 0.0300	< 1.00	0.526 J	0.0586 J	< 0.500	< 2.00	< 0.0670	< 0.167	5.81	< 1.50	< 0.125
	6/14/2023	< 0.600	< 1.66	27.0	< 0.200	< 0.0300	< 1.00	0.597 J	0.0550 J	< 0.500	< 2.00	< 0.0670	< 0.311	1.75 J	< 1.50	< 0.125
	7/18/2023	< 0.600	< 1.66	28.0	< 0.200	< 0.0300	< 1.00	0.590 J	< 0.0330	< 0.500	< 2.00	< 0.0670	< 0.167	2.66 J	< 1.50	< 0.125
	8/15/2023	< 0.600	< 1.66	25.8	< 0.200	< 0.0300	< 1.00	0.580 J	0.0760 J	< 0.500	< 2.00	< 0.0670	< 0.167	3.10 J	< 1.50	< 0.125
MW-LF-01	1/18/2023	< 0.600	< 1.66	37.4	< 0.200	< 0.0300	< 1.00	0.286 J	< 0.0330	< 0.500	< 2.00	< 0.0670	< 0.167	2.08 J	< 1.50	< 0.125
	2/14/2023	< 0.600	< 1.66	36.2	< 0.200	< 0.0300	< 1.00	0.294 J	< 0.0330	< 0.500	< 2.00	< 0.0670	< 0.167	3.34	< 1.50	< 0.125
	3/7/2023	< 0.600	< 1.66	32.3	< 0.200	< 0.0300	< 1.00	0.273 J	< 0.0566	< 0.500	< 2.00	< 0.0670	< 0.167	1.42 J	< 1.50	< 0.125
	4/12/2023	< 0.600	< 1.66	33.8	< 0.200	< 0.0300	< 1.00	0.267 J	0.0488 J	< 0.500	< 2.00	< 0.109	< 0.167	< 1.95	< 1.50	< 0.125
	5/22/2023	< 0.600	< 1.66	33.2	< 0.200	< 0.0300	< 1.00	0.258 J	< 0.0330	< 0.500	< 2.00	< 0.0670	< 0.167	5.16	< 1.50	< 0.125
	6/14/2023	< 0.600	< 1.66	34.4	< 0.200	< 0.0300	< 1.00	0.314 J	0.0394 J	< 0.500	< 2.00	< 0.0670	< 0.167	0.772 J	< 1.50	< 0.125
	7/18/2023	< 0.600	< 1.66	36.1	< 0.200	< 0.0300	< 1.00	0.267 J	< 0.0330	< 0.500	< 2.00	< 0.0670	< 0.167	4.59	< 1.50	< 0.125
	8/15/2023	< 0.600	< 1.66	34.7	< 0.200	< 0.0300	< 1.00	0.308 J	0.0344 J	< 0.500	< 2.00	< 0.0670	< 0.167	3.61 J	< 1.50	< 0.125

Appendix B

Summary of General Statistics

General Statistics on Uncensored Full Data (Appendix III Constituents)

Date/Time of Computation ProUCL 5.2 10/16/2023 5:01:07 PM

User Selected Options

From File WorkSheet.xls

Full Precision OFF

From File: WorkSheet.xls

General Statistics for Uncensored Data Sets

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Geo-Mean	SD	SEM	MAD/0.675	Skewness	CV
Boron	24	0	6.78	28.3	14.52	13.11	6.584	1.344	8.414	0.542	0.453
Calcium	24	0	1940	11200	3250	2935	1921	392.1	1045	3.277	0.591
Chloride	24	0	1.94	9.22	6.184	5.667	2.314	0.472	2.743	-0.453	0.374
pH	24	0	4.21	4.8	4.469	4.466	0.147	0.03	0.119	0.737	0.0329
Sulfate	24	0	0.24	37.4	10.58	4.271	9.027	1.843	6.079	0.829	0.853

Percentiles for Uncensored Data Sets

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
Boron	24	0	7.118	7.646	8.048	14.85	17.95	20.24	22.89	26.59	28.05
Calcium	24	0	1980	2016	2058	2685	3708	3876	4434	4513	9664
Chloride	24	0	3.029	3.536	3.758	6.495	8.118	8.34	8.806	8.873	9.142
pH	24	0	4.303	4.378	4.398	4.44	4.533	4.544	4.696	4.759	4.791
Sulfate	24	0	0.263	0.372	0.539	12.7	15.15	15.96	18.22	18.87	33.15

General Statistics on Censored Data (Appendix III Constituents)

Date/Time of Computation ProUCL 5.2 10/16/2023 5:00:32 PM
 User Selected Options
 From File WorkSheet.xls
 Full Precision OFF

From File: WorkSheet.xls

General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method

Variable	NumObs	# Missing	Num Ds	NumNDs	% NDs	Min ND	Max ND	KM Mean	KM Var	KM SD	KM CV
Fluoride	24	0	17	7	29.17%	0.033	0.0566	0.0609	0.00156	0.0395	0.649
TDS	24	0	19	5	20.83%	2.38	2.38	11.5	125.1	11.19	0.973

General Statistics for Raw Data Sets using Detected Data Only

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Median	Var	SD	MAD/0.675	Skewness	CV
Fluoride	17	0	0.0344	0.228	0.0721	0.062	0.00188	0.0434	0.0196	3.185	0.602
TDS	19	0	3	54	13.89	12	137.7	11.73	8.895	2.401	0.844

Percentiles using all Detects (Ds) and Non-Detects (NDs)

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
Fluoride	24	0	0.033	0.033	0.0341	0.0572	0.0669	0.0741	0.0808	0.0965	0.198
TDS	24	0	2.38	2.752	4.5	8	13.75	16.8	23.1	24.85	47.33

General Statistics on Uncensored Full Data (Appendix IV Constituents)

Date/Time of Computation ProUCL 5.2 11/8/2023 1:34:52 PM

User Selected Options

From File Cope_new baseline values_c.xls
 Full Precision OFF

From File: Cope_new baseline values_c.xls

General Statistics for Uncensored Data Sets

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Geo-Mean	SD	SEM	MAD/0.675	Skewness	CV
Barium	24	0	15.1	44.6	28.1	26.96	7.826	1.597	9.192	-0.0848	0.279
Cobalt	23	1	0.258	1.21	0.483	0.441	0.225	0.047	0.291	1.49	0.466

Percentiles for Uncensored Data Sets

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
Barium	24	0	17.42	18.88	21.25	28.35	33.95	34.52	36.17	37.22	42.94
Cobalt	23	1	0.268	0.289	0.3	0.526	0.589	0.594	0.677	0.722	1.104

General Statistics on Uncensored Data (Appen

Date/Time of Computation ProUCL 5.2 11/8/2023 1:35:49 PM

User Selected Options

From File Cope_new baseline values_c.xls
Full Precision OFF

From File: Cope_new baseline values_c.xls

General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method

Variable	NumObs	# Missing	Num Ds	NumNDs	% NDs	Min ND	Max ND	KM Mean	KM Var	KM SD	KM CV
Fluoride	24	0	17	7	29.17%	0.033	0.0566	0.0609	0.00156	0.0395	0.649
Radium-226/228	24	0	23	1	4.17%	1.95	1.95	2.917	1.363	1.167	0.4

General Statistics for Raw Data Sets using Detected Data Only

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Median	Var	SD	MAD/0.675	Skewness	CV
Fluoride	17	0	0.0344	0.228	0.0721	0.062	0.00188	0.0434	0.0196	3.185	0.602
Radium-226/228	23	0	0.772	5.81	2.98	2.74	1.378	1.174	0.979	0.608	0.394

Percentiles using all Detects (Ds) and Non-Detects (NDs)

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
Fluoride	24	0	0.033	0.033	0.0341	0.0572	0.0669	0.0741	0.0808	0.0965	0.198
Radium-226/228	24	0	1.804	2.028	2.215	2.7	3.588	3.638	4.41	5.075	5.661

Appendix C

Background Evaluation ProUCL Outputs

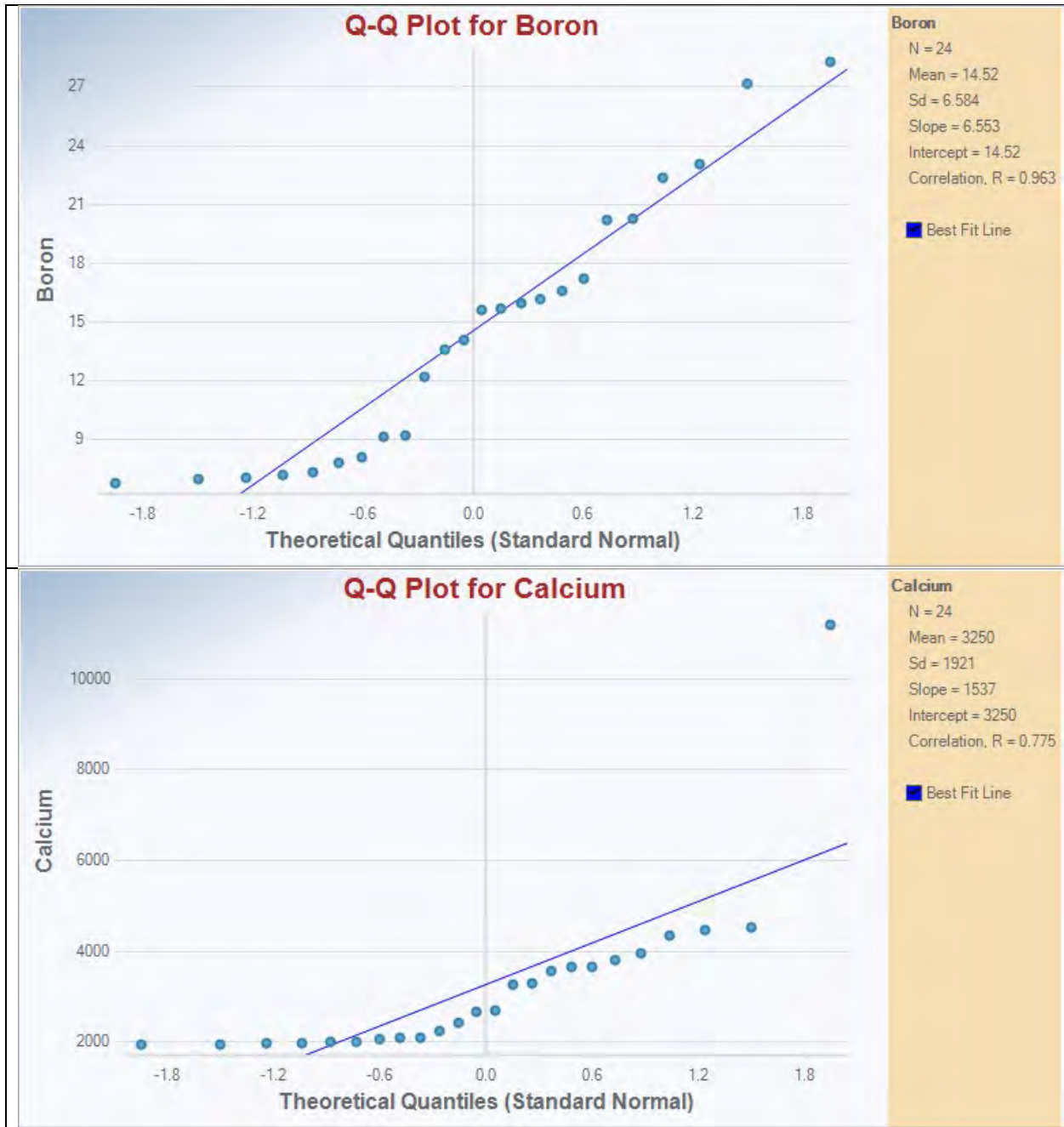
Appendix III Constituents

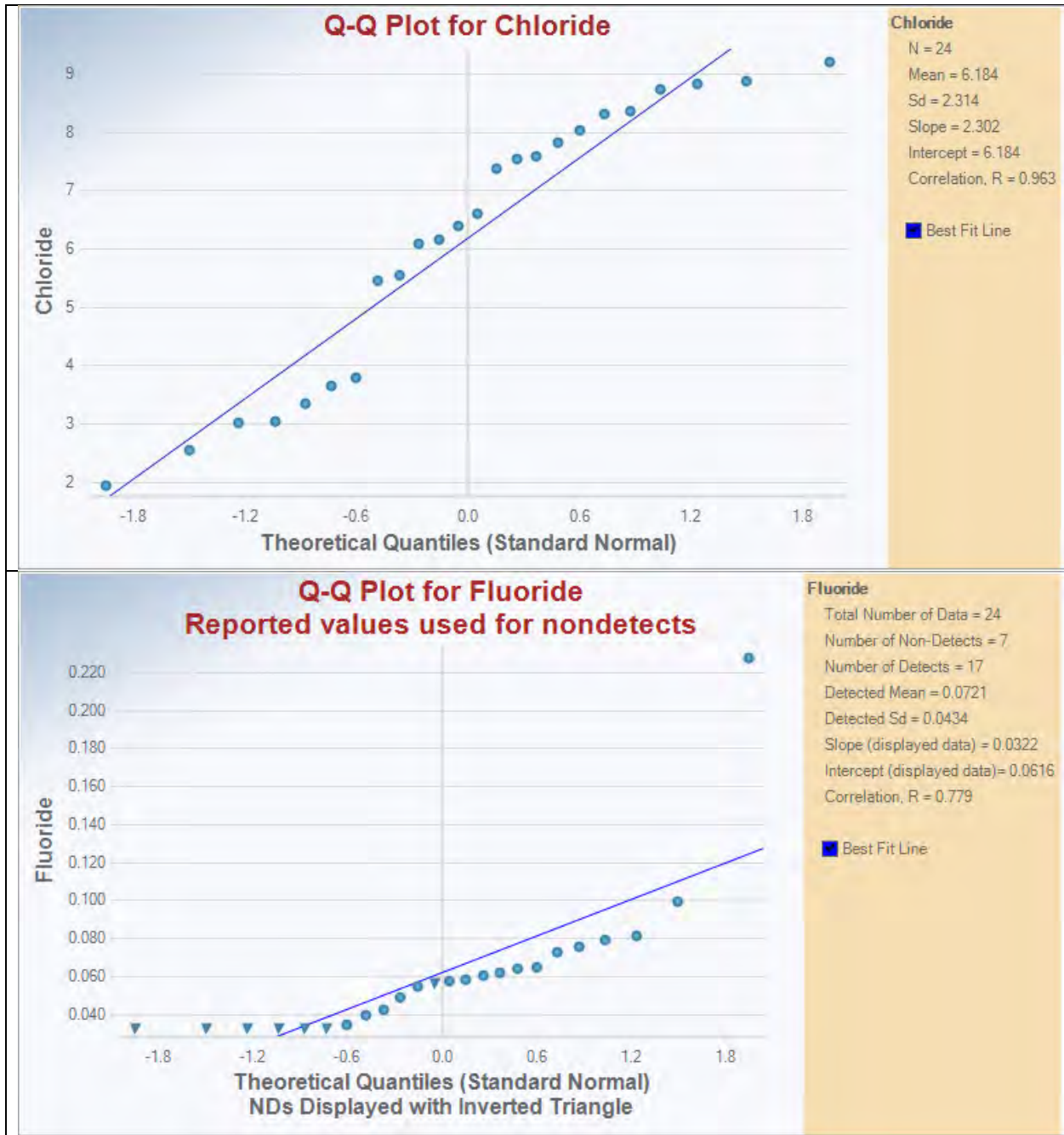
- Outliers
- Background Threshold Values

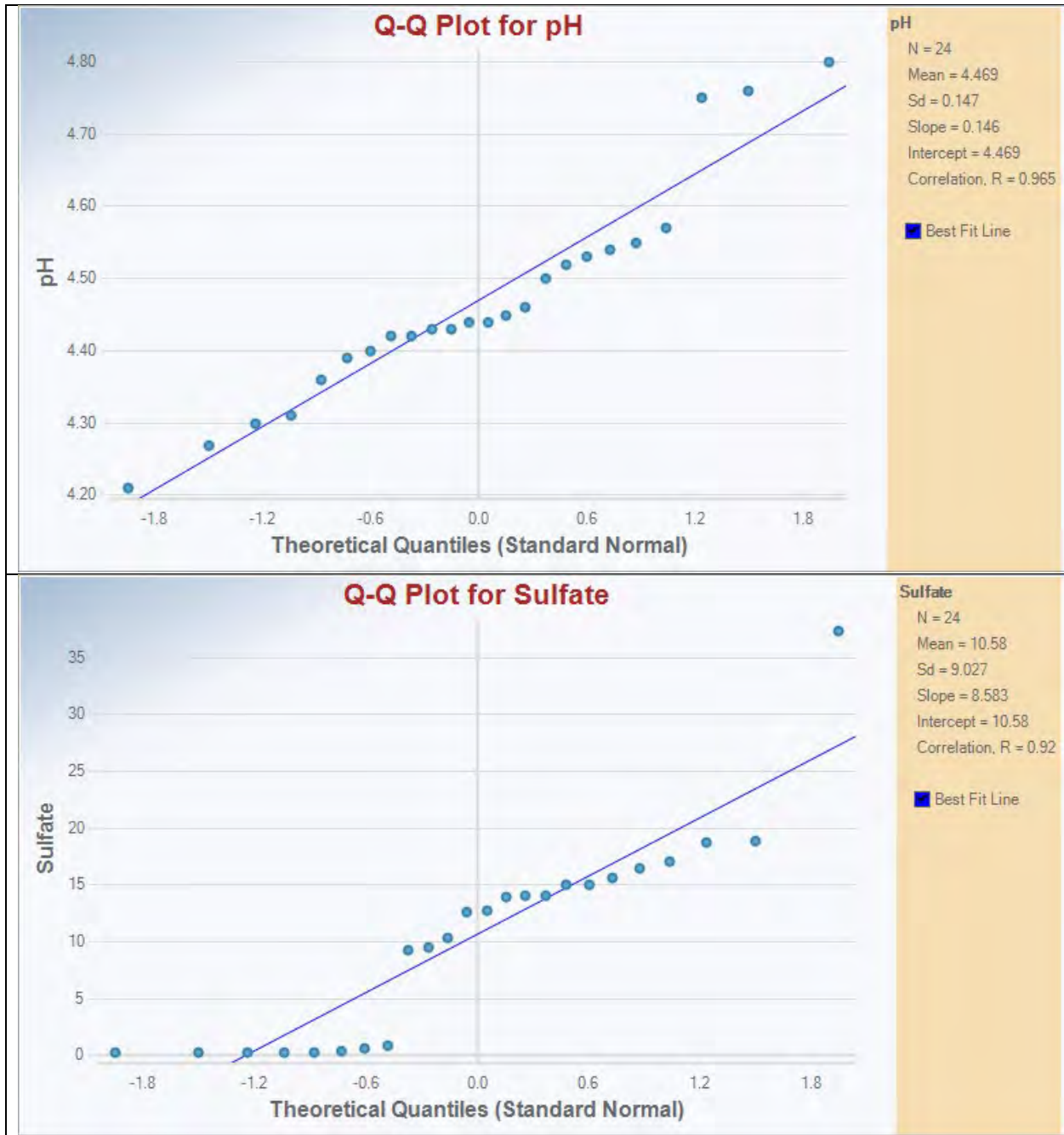
Appendix IV Constituents

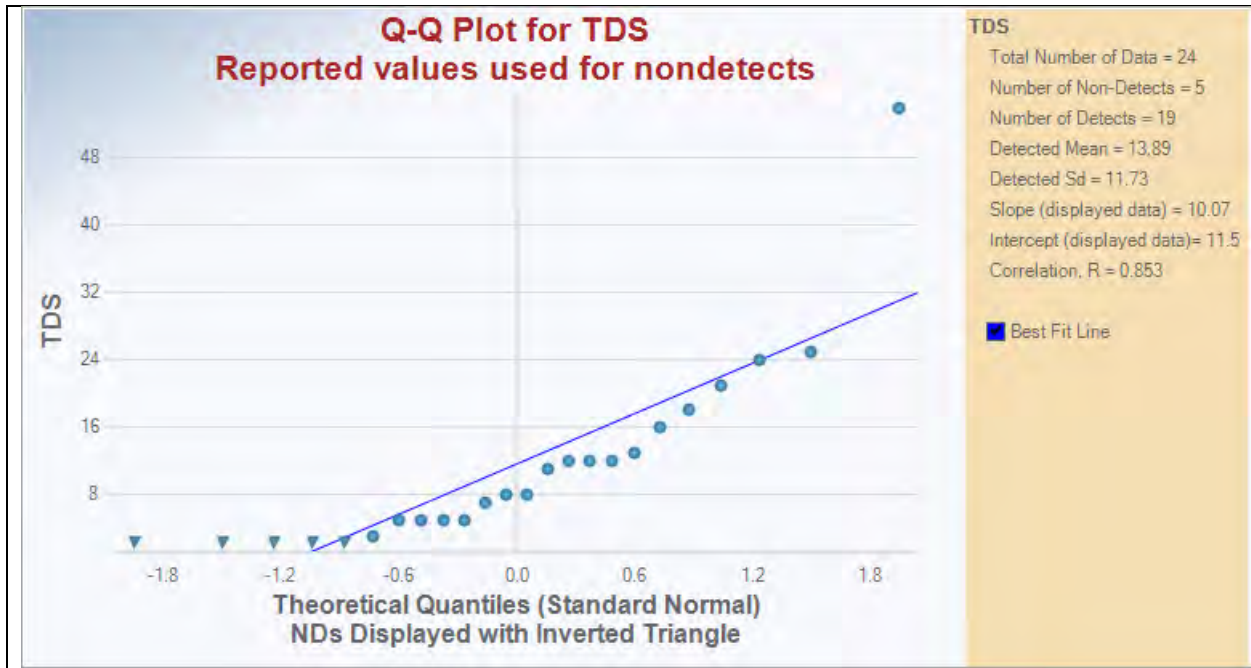
- Outliers
- Background Threshold Values

Appendix III Constituents









Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation ProUCL 5.2 9/21/2023 3:32:51 PM

From File WorkSheet.xls

Full Precision OFF

Dixon's Outlier Test for **Calcium**

Number of Observations = 24

10% critical value: 0.367

5% critical value: 0.413

1% critical value: 0.497

1. Observation Value 11200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.730

For 10% significance level, 11200 is an outlier.

For 5% significance level, 11200 is an outlier.

For 1% significance level, 11200 is an outlier.

2. Observation Value 1940 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.016

For 10% significance level, 1940 is not an outlier.

For 5% significance level, 1940 is not an outlier.

For 1% significance level, 1940 is not an outlier.

Dixon's Outlier Test for **Sulfate**

Number of Observations = 24

10% critical value: 0.367

5% critical value: 0.413

1% critical value: 0.497

1. Observation Value 37.4 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.504

For 10% significance level, 37.4 is an outlier.

For 5% significance level, 37.4 is an outlier.

For 1% significance level, 37.4 is an outlier.

2. Observation Value 0.24 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.001

For 10% significance level, 0.24 is not an outlier.

For 5% significance level, 0.24 is not an outlier.

For 1% significance level, 0.24 is not an outlier.

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation ProUCL 5.2 9/21/2023 3:35:38 PM

From File WorkSheet.xls

Full Precision OFF

Dixon's Outlier Test for **Fluoride**

Total N = 24

Number NDs = 7

Number Detects = 17

10% critical value: 0.438

5% critical value: 0.49

1% critical value: 0.577

Note: NDs excluded from Outlier Test

1. Data Value 0.228 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.790

For 10% significance level, 0.228 is an outlier.

For 5% significance level, 0.228 is an outlier.

For 1% significance level, 0.228 is an outlier.

2. Data Value 0.0344 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.174

For 10% significance level, 0.0344 is not an outlier.

For 5% significance level, 0.0344 is not an outlier.

For 1% significance level, 0.0344 is not an outlier.

Dixon's Outlier Test for TDS

Total N = 24

Number NDs = 5

Number Detects = 19

10% critical value: 0.412

5% critical value: 0.462

1% critical value: 0.547

Note: NDs excluded from Outlier Test

1. Data Value 54 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.612

For 10% significance level, 54 is an outlier.

For 5% significance level, 54 is an outlier.

For 1% significance level, 54 is an outlier.

2. Data Value 3 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.095

For 10% significance level, 3 is not an outlier.

For 5% significance level, 3 is not an outlier.

For 1% significance level, 3 is not an outlier.

Background Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	ProUCL 5.2 10/20/2023 11:57:46 AM
From File	P:\Clients\Dominion\South Carolina Sites\7_Cope Station SC\CCR\Class_3_Landfill\2023\Baseline Evaluation\New Background Stats\ProUCL_Input_Data_Cope_2023Q3_of rem.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	20
Number of Bootstrap Operations	2000

Boron

General Statistics

Total Number of Observations	24	Number of Distinct Observations	24
Minimum	6.78	First Quartile	8.048
Second Largest	27.2	Median	14.85
Maximum	28.3	Third Quartile	17.95
Mean	14.52	SD	6.584
Coefficient of Variation	0.453	Skewness	0.542
Mean of logged Data	2.573	SD of logged Data	0.469

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644
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Normal GOF Test

Shapiro Wilk Test Statistic	0.914
1% Shapiro Wilk Critical Value	0.884
Lilliefors Test Statistic	0.165
1% Lilliefors Critical Value	0.205

Shapiro Wilk GOF Test

Data appear Normal at 1% Significance Level

Lilliefors GOF Test

Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	29.72	90% Percentile (z)	22.96
95% UPL (t)	26.03	95% Percentile (z)	25.35
95% UPL for Next 20 Observations	35.37	99% Percentile (z)	29.83
95% UPL for Mean of 20 Observations	17.93	95% USL	31.92

Gamma GOF Test

A-D Test Statistic	0.659
5% A-D Critical Value	0.746
K-S Test Statistic	0.162
5% K-S Critical Value	0.178

Anderson-Darling Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.051	k star (bias corrected MLE)	4.448
Theta hat (MLE)	2.874	Theta star (bias corrected MLE)	3.264
nu hat (MLE)	242.5	nu star (bias corrected)	213.5
MLE Mean (bias corrected)	14.52	MLE Sd (bias corrected)	6.884

Background Statistics Assuming Gamma Distribution

95% Wilson Hiferty (WH) Approx. Gamma UPL	27.9	90% Percentile	23.74
95% Hawkins Wixley (HW) Approx. Gamma UPL	28.28	95% Percentile	27.37
95% WH UPL for Next 20 Observations	45.04	99% Percentile	35.09
95% HW UPL for Next 20 Observations	47.33		
95% WH Approx. Gamma UTL with 95% Coverage	34.01	95% HW Approx. Gamma UTL with 95% Coverage	34.93
95% WH USL	38.07	95% HW USL	39.43

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.917
10% Shapiro Wilk Critical Value	0.93

Shapiro Wilk Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors Test Statistic 0.149
 10% Lilliefors Critical Value 0.162

Lilliefors Lognormal GOF Test

Data appear Lognormal at 10% Significance Level

Data appear Approximate Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	38.66	90% Percentile (z)	23.89
95% UPL (t)	29.75	95% Percentile (z)	28.33
95% UPL for Next 20 Observations	57.82	99% Percentile (z)	38.98
95% UPL for Mean of 20 Observations	16.71	95% USL	45.23

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	24	95% UTL with 95% Coverage	28.3
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	28.3	95% BCA Bootstrap UTL with 95% Coverage	28.14
95% UPL	28.03	90% Percentile	22.89
90% Chebyshev UPL	34.68	95% Percentile	26.59
95% Chebyshev UPL	43.81	99% Percentile	28.05
95% USL	28.3		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Calcium

General Statistics

Total Number of Observations	23	Number of Distinct Observations	21
		Number of Missing Observations	1
Minimum	1940	First Quartile	2045
Second Largest	4470	Median	2670
Maximum	4520	Third Quartile	3665
Mean	2904	SD	926.7
Coefficient of Variation	0.319	Skewness	0.471
Mean of logged Data	7.926	SD of logged Data	0.314

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.328	d2max (for USL)	2.624
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Normal GOF Test

Shapiro Wilk Test Statistic	0.858
1% Shapiro Wilk Critical Value	0.881
Lilliefors Test Statistic	0.201
1% Lilliefors Critical Value	0.209

Shapiro Wilk GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	5061	90% Percentile (z)	4092
95% UPL (t)	4529	95% Percentile (z)	4428
95% UPL for Next 20 Observations	5856	99% Percentile (z)	5060
95% UPL for Mean of 20 Observations	3390	95% USL	5336

Gamma GOF Test

A-D Test Statistic	1.252
5% A-D Critical Value	0.744
K-S Test Statistic	0.211
5% K-S Critical Value	0.182

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	10.65	k star (bias corrected MLE)	9.292
Theta hat (MLE)	272.6	Theta star (bias corrected MLE)	312.5
nu hat (MLE)	490	nu star (bias corrected)	427.4
MLE Mean (bias corrected)	2904	MLE Sd (bias corrected)	952.6

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	4685	90% Percentile	4172
95% Hawkins Wixley (HW) Approx. Gamma UPL	4711	95% Percentile	4627
95% WH UPL for Next 20 Observations	6717	99% Percentile	5565
95% HW UPL for Next 20 Observations	6883		
95% WH Approx. Gamma UTL with 95% Coverage	5441	95% HW Approx. Gamma UTL with 95% Coverage	5508
95% WH USL	5861	95% HW USL	5956

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.862
10% Shapiro Wilk Critical Value	0.928
Lilliefors Test Statistic	0.206
10% Lilliefors Critical Value	0.165

Shapiro Wilk Lognormal GOF Test
Data Not Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test
Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	5748	90% Percentile (z)	4139
95% UPL (t)	4801	95% Percentile (z)	4639
95% UPL for Next 20 Observations	7524	99% Percentile (z)	5745
95% UPL for Mean of 20 Observations	3265	95% USL	6307

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	23	95% UTL with 95% Coverage	4520
Approx, f used to compute achieved CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL	0.693
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4520	95% BCA Bootstrap UTL with 95% Coverage	4520
95% UPL	4510	90% Percentile	4272
90% Chebyshev UPL	5744	95% Percentile	4458
95% Chebyshev UPL	7030	99% Percentile	4509
95% USL	4520		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Chloride

General Statistics

Total Number of Observations	24	Number of Distinct Observations	24
Minimum	1.94	First Quartile	3.758
Second Largest	8.88	Median	6.495
Maximum	9.22	Third Quartile	8.118
Mean	6.184	SD	2.314
Coefficient of Variation	0.374	Skewness	-0.453
Mean of logged Data	1.735	SD of logged Data	0.458

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644
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Normal GOF Test

Shapiro Wilk Test Statistic	0.91
1% Shapiro Wilk Critical Value	0.884
Lilliefors Test Statistic	0.157
1% Lilliefors Critical Value	0.205

Shapiro Wilk GOF Test

Data appear Normal at 1% Significance Level

Lilliefors GOF Test

Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	11.53	90% Percentile (z)	9.15
95% UPL (t)	10.23	95% Percentile (z)	9.991
95% UPL for Next 20 Observations	13.52	99% Percentile (z)	11.57
95% UPL for Mean of 20 Observations	7.385	95% USL	12.3

Gamma GOF Test

A-D Test Statistic	1.106
5% A-D Critical Value	0.746
K-S Test Statistic	0.178
5% K-S Critical Value	0.178

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.883	k star (bias corrected MLE)	5.176
Theta hat (MLE)	1.051	Theta star (bias corrected MLE)	1.195
nu hat (MLE)	282.4	nu star (bias corrected)	248.4
MLE Mean (bias corrected)	6.184	MLE Sd (bias corrected)	2.718

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	11.43	90% Percentile	9.822
95% Hawkins Wixley (HW) Approx. Gamma UPL	11.67	95% Percentile	11.23
95% WH UPL for Next 20 Observations	17.95	99% Percentile	14.19
95% HW UPL for Next 20 Observations	19.03		
95% WH Approx. Gamma UTL with 95% Coverage	13.77	95% HW Approx. Gamma UTL with 95% Coverage	14.26
95% WH USL	15.31	95% HW USL	16

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.867
10% Shapiro Wilk Critical Value	0.93

Shapiro Wilk Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors Test Statistic 0.187
 10% Lilliefors Critical Value 0.162

Lilliefors Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	16.33	90% Percentile (z)	10.2
95% UPL (t)	12.63	95% Percentile (z)	12.04
95% UPL for Next 20 Observations	24.21	99% Percentile (z)	16.46
95% UPL for Mean of 20 Observations	7.188	95% USL	19.04

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	24	95% UTL with 95% Coverage	9.22
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	9.22	95% BCA Bootstrap UTL with 95% Coverage	9.22
95% UPL	9.135	90% Percentile	8.806
90% Chebyshev UPL	13.27	95% Percentile	8.873
95% Chebyshev UPL	16.48	99% Percentile	9.142
95% USL	9.22		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

pH

General Statistics

Total Number of Observations	24	Number of Distinct Observations	21
Minimum	4.21	First Quartile	4.398

Second Largest	4.76	Median	4.44
Maximum	4.8	Third Quartile	4.533
Mean	4.469	SD	0.147
Coefficient of Variation	0.0329	Skewness	0.737
Mean of logged Data	1.497	SD of logged Data	0.0325

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644
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Normal GOF Test

Shapiro Wilk Test Statistic	0.931
1% Shapiro Wilk Critical Value	0.884
Lilliefors Test Statistic	0.149
1% Lilliefors Critical Value	0.205

Shapiro Wilk GOF Test

Data appear Normal at 1% Significance Level

Lilliefors GOF Test

Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	4.808	90% Percentile (z)	4.657
95% UPL (t)	4.726	95% Percentile (z)	4.71
95% UPL for Next 20 Observations	4.934	99% Percentile (z)	4.81
95% UPL for Mean of 20 Observations	4.545	95% USL	4.857

Gamma GOF Test

A-D Test Statistic	0.638
5% A-D Critical Value	0.742
K-S Test Statistic	0.146
5% K-S Critical Value	0.177

Anderson-Darling Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	980	k star (bias corrected MLE)	857.5
Theta hat (MLE)	0.00456	Theta star (bias corrected MLE)	0.00521
nu hat (MLE)	47040	nu star (bias corrected)	41161

MLE Mean (bias corrected)	4.469	MLE Sd (bias corrected)	0.153
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Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	4.727	90% Percentile	4.665
95% Hawkins Wixley (HW) Approx. Gamma UPL	4.727	95% Percentile	4.723
95% WH UPL for Next 20 Observations	4.945	99% Percentile	4.831
95% HW UPL for Next 20 Observations	4.947		
95% WH Approx. Gamma UTL with 95% Coverage	4.812	95% HW Approx. Gamma UTL with 95% Coverage	4.813
95% WH USL	4.864	95% HW USL	4.865

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Lognormal GOF Test
10% Shapiro Wilk Critical Value	0.93	Data appear Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.143	Lilliefors Lognormal GOF Test
10% Lilliefors Critical Value	0.162	Data appear Lognormal at 10% Significance Level

Data appear Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	4.815	90% Percentile (z)	4.657
95% UPL (t)	4.728	95% Percentile (z)	4.712
95% UPL for Next 20 Observations	4.951	99% Percentile (z)	4.818
95% UPL for Mean of 20 Observations	4.543	95% USL	4.868

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	24	95% UTL with 95% Coverage	4.8
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	4.8	95% BCA Bootstrap UTL with 95% Coverage	4.8
95% UPL	4.79	90% Percentile	4.696
90% Chebyshev UPL	4.918	95% Percentile	4.759

95% Chebyshev UPL	5.122	99% Percentile	4.791
95% USL	4.8		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Sulfate

General Statistics

Total Number of Observations	23	Number of Distinct Observations	21
		Number of Missing Observations	1
Minimum	0.24	First Quartile	0.499
Second Largest	18.7	Median	12.6
Maximum	18.9	Third Quartile	15
Mean	9.417	SD	7.146
Coefficient of Variation	0.759	Skewness	-0.337
Mean of logged Data	1.357	SD of logged Data	1.814

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.328	d2max (for USL)	2.624
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Normal GOF Test

Shapiro Wilk Test Statistic	0.828
1% Shapiro Wilk Critical Value	0.881
Lilliefors Test Statistic	0.232
1% Lilliefors Critical Value	0.209

Shapiro Wilk GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	26.05	90% Percentile (z)	18.58
95% UPL (t)	21.95	95% Percentile (z)	21.17
95% UPL for Next 20 Observations	32.18	99% Percentile (z)	26.04

95% UPL for Mean of 20 Observations	13.17	95% USL	28.17
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Gamma GOF Test

A-D Test Statistic	2.755
5% A-D Critical Value	0.788
K-S Test Statistic	0.308
5% K-S Critical Value	0.189

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.685	k star (bias corrected MLE)	0.625
Theta hat (MLE)	13.75	Theta star (bias corrected MLE)	15.08
nu hat (MLE)	31.51	nu star (bias corrected)	28.73
MLE Mean (bias corrected)	9.417	MLE Sd (bias corrected)	11.92

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	35.78	90% Percentile	24.27
95% Hawkins Wixley (HW) Approx. Gamma UPL	41.35	95% Percentile	33.4
95% WH UPL for Next 20 Observations	90.99	99% Percentile	55.4
95% HW UPL for Next 20 Observations	126.8		
95% WH Approx. Gamma UTL with 95% Coverage	53.89	95% HW Approx. Gamma UTL with 95% Coverage	67.31
95% WH USL	65.25	95% HW USL	84.7

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.723
10% Shapiro Wilk Critical Value	0.928
Lilliefors Test Statistic	0.338
10% Lilliefors Critical Value	0.165

Shapiro Wilk Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	265.3	90% Percentile (z)	39.74
95% UPL (t)	93.66	95% Percentile (z)	76.83

95% UPL for Next 20 Observations	1258	99% Percentile (z)	264.5
95% UPL for Mean of 20 Observations	10.07	95% USL	453.8

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	23	95% UTL with 95% Coverage	18.9
Approx, f used to compute achieved CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL	0.693
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	18.9	95% BCA Bootstrap UTL with 95% Coverage	18.9
95% UPL	18.86	90% Percentile	16.98
90% Chebyshev UPL	31.32	95% Percentile	18.54
95% Chebyshev UPL	41.24	99% Percentile	18.86

95% USL 18.9

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.2 10/20/2023 1:15:16 PM
From File	ProUCL_Input_Data_Cope_2023Q3_ol rem.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	20
Number of Bootstrap Operations	2000

Fluoride

General Statistics

Total Number of Observations	23	Number of Missing Observations	1
Number of Distinct Observations	18		
Number of Detects	16	Number of Non-Detects	7
Number of Distinct Detects	16	Number of Distinct Non-Detects	2
Minimum Detect	0.0344	Minimum Non-Detect	0.033
Maximum Detect	0.0992	Maximum Non-Detect	0.0566
Variance Detected	2.8581E-4	Percent Non-Detects	30.43%
Mean Detected	0.0623	SD Detected	0.0169
Mean of Detected Logged Data	-2.812	SD of Detected Logged Data	0.281

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.328	d2max (for USL)	2.624
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.978	Shapiro Wilk GOF Test
1% Shapiro Wilk Critical Value	0.844	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.127	Lilliefors GOF Test
1% Lilliefors Critical Value	0.248	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0536	KM SD	0.019
95% UTL95% Coverage	0.0979	95% KM UPL (t)	0.087
95% KM UPL for Next 20 Observations	0.114	95% KM UPL for Mean of Next 20 Observations	0.0636
90% KM Percentile (z)	0.078	95% KM Percentile (z)	0.0849
99% KM Percentile (z)	0.0979	95% KM USL	0.104

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0489	SD	0.0251
95% UTL95% Coverage	0.107	95% UPL (t)	0.0929
95% UPL for Next 20 Observations	0.129	95% UPL for Mean of Next 20 Observations	0.0621
90% Percentile (z)	0.0811	95% Percentile (z)	0.0902
99% Percentile (z)	0.107	95% USL	0.115

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.189	Anderson-Darling GOF Test
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.11	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.215	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	14.11	k star (bias corrected MLE)	11.51
Theta hat (MLE)	0.00442	Theta star (bias corrected MLE)	0.00542
nu hat (MLE)	451.5	nu star (bias corrected)	368.2
MLE Mean (bias corrected)	0.0623		
MLE Sd (bias corrected)	0.0184	95% Percentile of Chisquare (2kstar)	35.19

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
 GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
 For such situations, GROS method may yield incorrect values of UCLs and BTVs
 This is especially true when the sample size is small.
 For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0162	Mean	0.052
Maximum	0.0992	Median	0.055
SD	0.0216	CV	0.415
k hat (MLE)	5.498	k star (bias corrected MLE)	4.81
Theta hat (MLE)	0.00945	Theta star (bias corrected MLE)	0.0108
nu hat (MLE)	252.9	nu star (bias corrected)	221.3
MLE Mean (bias corrected)	0.052	MLE Sd (bias corrected)	0.0237
95% Percentile of Chisquare (2kstar)	17.78	90% Percentile	0.0837
95% Percentile	0.096	99% Percentile	0.122

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.119	0.123	95% Approx. Gamma UPL	0.0979	0.0996
95% Gamma USL	0.131	0.136	95% UPL for Next 20 Observations	0.156	0.165

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0536	SD (KM)	0.019
Variance (KM)	3.6273E-4	SE of Mean (KM)	0.00412
k hat (KM)	7.922	k star (KM)	6.918
nu hat (KM)	364.4	nu star (KM)	318.2
theta hat (KM)	0.00677	theta star (KM)	0.00775
80% gamma percentile (KM)	0.0696	90% gamma percentile (KM)	0.0808
95% gamma percentile (KM)	0.0909	99% gamma percentile (KM)	0.112

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.107	0.108	95% Approx. Gamma UPL	0.0906	0.0913
95% KM Gamma Percentile	0.0877	0.0882	95% Gamma USL	0.116	0.118

Lognormal GOF Test on Detected Observations Only

		Shapiro Wilk GOF Test
Shapiro Wilk Test Statistic	0.975	
10% Shapiro Wilk Critical Value	0.906	Detected Data appear Lognormal at 10% Significance Level

Lilliefors Test Statistic	0.13	Lilliefors GOF Test	
10% Lilliefors Critical Value	0.196	Detected Data appear Lognormal at 10% Significance Level	

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0531	Mean in Log Scale	-3.006
SD in Original Scale	0.0201	SD in Log Scale	0.389
95% UTL95% Coverage	0.123	95% BCA UTL95% Coverage	0.0992
95% Bootstrap (%) UTL95% Coverage	0.0992	95% UPL (t)	0.098
95% UPL for Next 20 Observations	0.171	95% UPL for Mean of 20 Observations	0.0607
90% Percentile (z)	0.0815	95% Percentile (z)	0.0939
99% Percentile (z)	0.122	95% USL	0.137

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-2.989	95% KM UTL (Lognormal)95% Coverage	0.115
KM SD of Logged Data	0.354	95% KM UPL (Lognormal)	0.0936
95% KM Percentile Lognormal (z)	0.0901	95% KM USL (Lognormal)	0.127

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0489	Mean in Log Scale	-3.182
SD in Original Scale	0.0251	SD in Log Scale	0.626
95% UTL95% Coverage	0.178	95% UPL (t)	0.125
95% UPL for Next 20 Observations	0.305	95% UPL for Mean of 20 Observations	0.0577
90% Percentile (z)	0.0927	95% Percentile (z)	0.116
99% Percentile (z)	0.178	95% USL	0.215

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs (no distinction made between detects and nondetects)

Order of Statistic, r	23	95% UTL with95% Coverage	0.0992
Approx, f used to compute achieved CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL	0.693

Approximate Sample Size needed to achieve specified CC	59	95% UPL	0.0957
95% USL	0.0992	95% KM Chebyshev UPL	0.138

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

TDS

General Statistics

Total Number of Observations	23	Number of Missing Observations	1
Number of Distinct Observations	13		
Number of Detects	18	Number of Non-Detects	5
Number of Distinct Detects	12	Number of Distinct Non-Detects	1
Minimum Detect	3	Minimum Non-Detect	2.38
Maximum Detect	25	Maximum Non-Detect	2.38
Variance Detected	45.88	Percent Non-Detects	21.74%
Mean Detected	11.67	SD Detected	6.774
Mean of Detected Logged Data	2.287	SD of Detected Logged Data	0.618

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.328	d2max (for USL)	2.624
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.911	Shapiro Wilk GOF Test	
1% Shapiro Wilk Critical Value	0.858	Detected Data appear Normal at 1% Significance Level	
Lilliefors Test Statistic	0.15	Lilliefors GOF Test	
1% Lilliefors Critical Value	0.235	Detected Data appear Normal at 1% Significance Level	

Detected Data appear Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	9.648	KM SD	6.97
95% UTL95% Coverage	25.87	95% KM UPL (t)	21.87

95% KM UPL for Next 20 Observations	31.85	95% KM UPL for Mean of Next 20 Observations	13.31
90% KM Percentile (z)	18.58	95% KM Percentile (z)	21.11
99% KM Percentile (z)	25.86	95% KM USL	27.94

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	9.389	SD	7.415
95% UTL	26.65	95% UPL (t)	22.4
95% UPL for Next 20 Observations	33.01	95% UPL for Mean of Next 20 Observations	13.28
90% Percentile (z)	18.89	95% Percentile (z)	21.59
99% Percentile (z)	26.64	95% USL	28.84

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.356	Anderson-Darling GOF Test
5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.144	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.205	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.1	k star (bias corrected MLE)	2.62
Theta hat (MLE)	3.764	Theta star (bias corrected MLE)	4.453
nu hat (MLE)	111.6	nu star (bias corrected)	94.32
MLE Mean (bias corrected)	11.67		
MLE Sd (bias corrected)	7.208	95% Percentile of Chisquare (2kstar)	11.44

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
 GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	9.264
Maximum	25	Median	8
SD	7.569	CV	0.817

k hat (MLE)	0.69	k star (bias corrected MLE)	0.629
Theta hat (MLE)	13.42	Theta star (bias corrected MLE)	14.72
nu hat (MLE)	31.76	nu star (bias corrected)	28.95
MLE Mean (bias corrected)	9.264	MLE Sd (bias corrected)	11.68
95% Percentile of Chisquare (2kstar)	4.452	90% Percentile	23.84
95% Percentile	32.77	99% Percentile	54.28

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	49.33	63.66	95% Approx. Gamma UPL	33.38	39.77
95% Gamma USL	59.23	79.53	95% UPL for Next 20 Observations	81.53	117.6

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	9.648	SD (KM)	6.97
Variance (KM)	48.59	SE of Mean (KM)	1.496
k hat (KM)	1.916	k star (KM)	1.695
nu hat (KM)	88.13	nu star (KM)	77.97
theta hat (KM)	5.036	theta star (KM)	5.692
80% gamma percentile (KM)	14.72	90% gamma percentile (KM)	19.52
95% gamma percentile (KM)	24.14	99% gamma percentile (KM)	34.48

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	32.94	34.94	95% Approx. Gamma UPL	24.61	25.36
95% KM Gamma Percentile	23.2	23.79	95% Gamma USL	37.89	40.83

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952
10% Shapiro Wilk Critical Value	0.914
Lilliefors Test Statistic	0.141
10% Lilliefors Critical Value	0.185

Shapiro Wilk GOF Test

Detected Data appear Lognormal at 10% Significance Level

Lilliefors GOF Test

Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	9.652	Mean in Log Scale	1.972
SD in Original Scale	7.129	SD in Log Scale	0.828
95% UTL95% Coverage	49.36	95% BCA UTL95% Coverage	25
95% Bootstrap (%) UTL95% Coverage	25	95% UPL (t)	30.69
95% UPL for Next 20 Observations	100.4	95% UPL for Mean of 20 Observations	11.1
90% Percentile (z)	20.76	95% Percentile (z)	28.04
99% Percentile (z)	49.29	95% USL	63.06

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	1.978	95% KM UTL (Lognormal)95% Coverage	45.56
KM SD of Logged Data	0.791	95% KM UPL (Lognormal)	28.94
95% KM Percentile Lognormal (z)	26.55	95% KM USL (Lognormal)	57.57

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	9.389	Mean in Log Scale	1.828
SD in Original Scale	7.415	SD in Log Scale	1.044
95% UTL95% Coverage	70.61	95% UPL (t)	38.79
95% UPL for Next 20 Observations	172.9	95% UPL for Mean of 20 Observations	10.76
90% Percentile (z)	23.69	95% Percentile (z)	34.61
99% Percentile (z)	70.49	95% USL	96.16

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

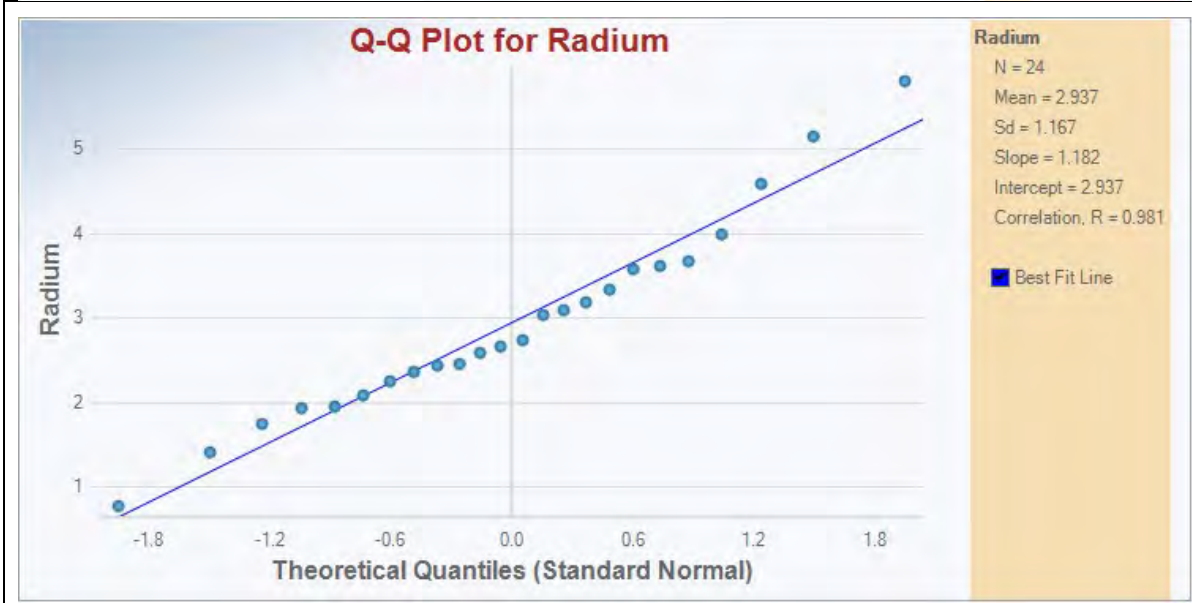
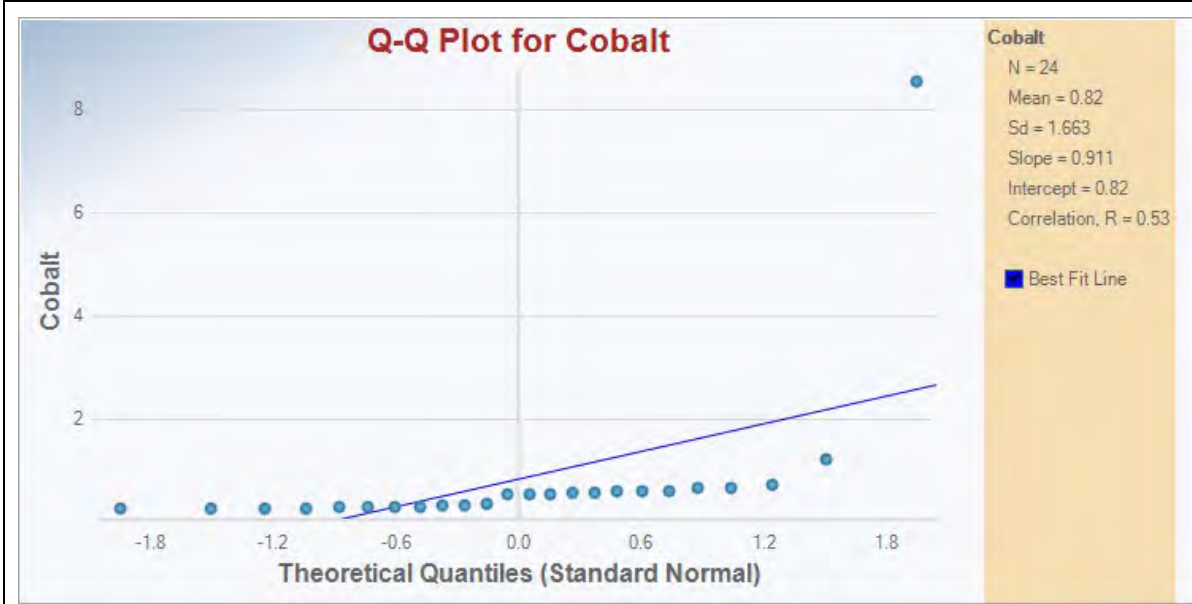
Nonparametric Upper Limits for BTVs (no distinction made between detects and nondetects)

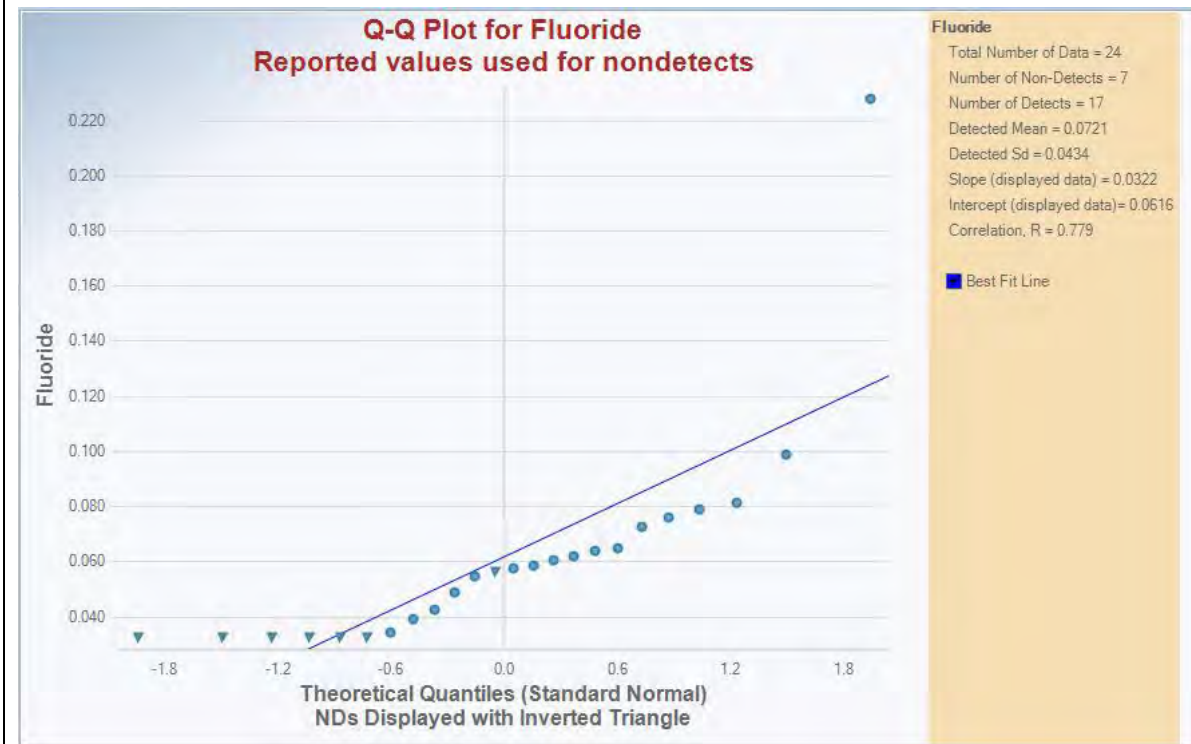
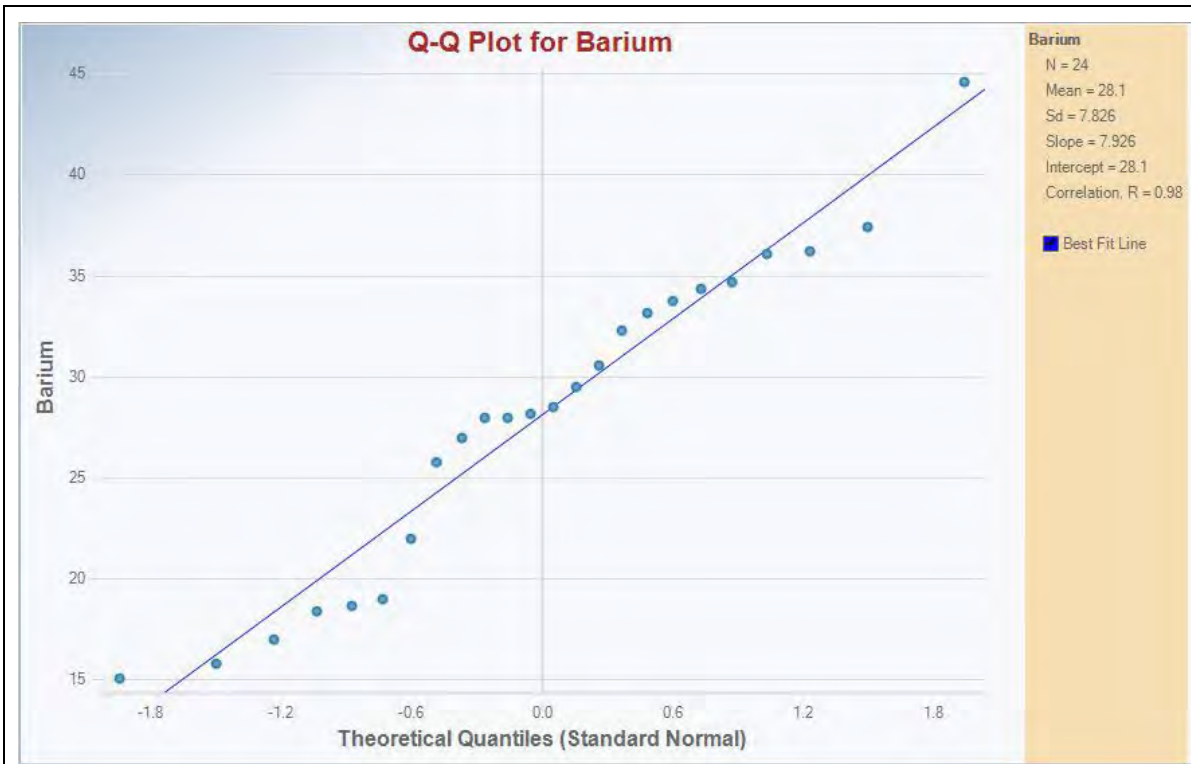
Order of Statistic, r	23	95% UTL with95% Coverage	25
Approx, f used to compute achieved CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL	0.693
Approximate Sample Size needed to achieve specified CC	59	95% UPL	24.8
95% USL	25	95% KM Chebyshev UPL	40.68

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Appendix IV Constituents





Outlier Tests for Selected Uncensored Variables

User Selected Options

Date/Time of Computation ProUCL 5.2 9/22/2023 11:22:33 AM
From File WorkSheet_a.xls
Full Precision OFF

Dixon's Outlier Test for Cobalt

Number of Observations = 24

10% critical value: 0.367

5% critical value: 0.413

1% critical value: 0.497

1. Observation Value 8.56 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.945

For 10% significance level, 8.56 is an outlier.

For 5% significance level, 8.56 is an outlier.

For 1% significance level, 8.56 is an outlier.

2. Observation Value 0.258 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.019

For 10% significance level, 0.258 is not an outlier.

For 5% significance level, 0.258 is not an outlier.

For 1% significance level, 0.258 is not an outlier.

Background Statistics for Uncensored Full Data Sets (Appendix IV)

User Selected Options

Date/Time of Computation	ProUCL 5.2 11/8/2023 1:44:04 PM
From File	P:\Clients\Dominion\South Carolina Sites\7_Cope Station SC\CCR\Class_3_Landfill\2023\Baseline Evaluation\New Background Stats Report\Data Evaluation\Cope_new baseline values.xlsx
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
New or Future K Observations	1
Number of Bootstrap Operations	2000

Barium

General Statistics

Total Number of Observations	24	Number of Distinct Observations	23
Minimum	15.1	First Quartile	21.25
Second Largest	37.4	Median	28.35
Maximum	44.6	Third Quartile	33.95
Mean	28.1	SD	7.826
Coefficient of Variation	0.279	Skewness	-0.0848
Mean of logged Data	3.294	SD of logged Data	0.302

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644
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Normal GOF Test

Shapiro Wilk Test Statistic	0.955
1% Shapiro Wilk Critical Value	0.884
Lilliefors Test Statistic	0.127
1% Lilliefors Critical Value	0.205

Shapiro Wilk GOF Test

Data appear Normal at 1% Significance Level

Lilliefors GOF Test

Data appear Normal at 1% Significance Level

Data appear Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	46.17	90% Percentile (z)	38.13
95% UPL (t)	41.78	95% Percentile (z)	40.97
95% USL	48.79	99% Percentile (z)	46.3

Gamma GOF Test

A-D Test Statistic	0.672
5% A-D Critical Value	0.744
K-S Test Statistic	0.158
5% K-S Critical Value	0.178

Anderson-Darling Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	12.31	k star (bias corrected MLE)	10.8
Theta hat (MLE)	2.282	Theta star (bias corrected MLE)	2.601
nu hat (MLE)	591	nu star (bias corrected)	518.5
MLE Mean (bias corrected)	28.1	MLE Sd (bias corrected)	8.549

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	43.96	90% Percentile	39.46
95% Hawkins Wixley (HW) Approx. Gamma UPL	44.34	95% Percentile	43.47
95% WH Approx. Gamma UTL with 95% Coverage	50.42	99% Percentile	51.7
95% HW Approx. Gamma UTL with 95% Coverage	51.21		
95% WH USL	54.58	95% HW USL	55.68

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.924
10% Shapiro Wilk Critical Value	0.93
Lilliefors Test Statistic	0.175
10% Lilliefors Critical Value	0.162

Shapiro Wilk Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Lilliefors Lognormal GOF Test

Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	54.12	90% Percentile (z)	39.69
95% UPL (t)	45.71	95% Percentile (z)	44.29
95% USL	59.88	99% Percentile (z)	54.41

Nonparametric Distribution Free Background Statistics

Data appear Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	24	95% UTL with 95% Coverage	44.6
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	44.6	95% BCA Bootstrap UTL with 95% Coverage	44.6
95% UPL	42.8	90% Percentile	36.17
90% Chebyshev UPL	52.06	95% Percentile	37.22
95% Chebyshev UPL	62.91	99% Percentile	42.94
95% USL	44.6		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Cobalt

General Statistics

Total Number of Observations	23	Number of Distinct Observations	22
		Number of Missing Observations	1
Minimum	0.258	First Quartile	0.3
Second Largest	0.727	Median	0.526
Maximum	1.21	Third Quartile	0.589
Mean	0.483	SD	0.225

Coefficient of Variation	0.466	Skewness	1.49
Mean of logged Data	-0.819	SD of logged Data	0.429

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.328	d2max (for USL)	2.624
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Normal GOF Test

Shapiro Wilk Test Statistic	0.821
1% Shapiro Wilk Critical Value	0.881
Lilliefors Test Statistic	0.186
1% Lilliefors Critical Value	0.209

Shapiro Wilk GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

Data appear Normal at 1% Significance Level

Data appear Approximate Normal at 1% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.008	90% Percentile (z)	0.772
95% UPL (t)	0.878	95% Percentile (z)	0.854
95% USL	1.074	99% Percentile (z)	1.007

Gamma GOF Test

A-D Test Statistic	1.133
5% A-D Critical Value	0.746
K-S Test Statistic	0.195
5% K-S Critical Value	0.182

Anderson-Darling Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov Gamma GOF Test

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	5.639	k star (bias corrected MLE)	4.932
Theta hat (MLE)	0.0857	Theta star (bias corrected MLE)	0.0979
nu hat (MLE)	259.4	nu star (bias corrected)	226.9
MLE Mean (bias corrected)	0.483	MLE Sd (bias corrected)	0.218

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.902	90% Percentile	0.774
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95% Hawkins Wixley (HW) Approx. Gamma UPL	0.909	95% Percentile	0.887
95% WH Approx. Gamma UTL with 95% Coverage	1.096	99% Percentile	1.126
95% HW Approx. Gamma UTL with 95% Coverage	1.116		
95% WH USL	1.206	95% HW USL	1.235

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.887	Shapiro Wilk Lognormal GOF Test
10% Shapiro Wilk Critical Value	0.928	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.185	Lilliefors Lognormal GOF Test
10% Lilliefors Critical Value	0.165	Data Not Lognormal at 10% Significance Level

Data Not Lognormal at 10% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1.196	90% Percentile (z)	0.764
95% UPL (t)	0.935	95% Percentile (z)	0.892
95% USL	1.357	99% Percentile (z)	1.195

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 1% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, order	23	95% UTL with 95% Coverage	1.21
Approx, f used to compute achieved CC	1.211	Approximate Actual Confidence Coefficient achieved by UTL	0.693
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.21	95% BCA Bootstrap UTL with 95% Coverage	1.162
95% UPL	1.113	90% Percentile	0.677
90% Chebyshev UPL	1.173	95% Percentile	0.722
95% Chebyshev UPL	1.486	99% Percentile	1.104
95% USL	1.21		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data

represents a background data set and when many onsite observations need to be compared with the BTV.

Background Statistics for Data Sets with Non-Detects (Appendix IV)

User Selected Options

Date/Time of Computation	ProUCL 5.2 11/8/2023 2:05:14 PM
From File	Cope_new baseline values_c.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Fluoride

General Statistics

Total Number of Observations	24	Number of Missing Observations	0
Number of Distinct Observations	19		
Number of Detects	17	Number of Non-Detects	7
Number of Distinct Detects	17	Number of Distinct Non-Detects	2
Minimum Detect	0.0344	Minimum Non-Detect	0.033
Maximum Detect	0.228	Maximum Non-Detect	0.0566
Variance Detected	0.00188	Percent Non-Detects	29.17%
Mean Detected	0.0721	SD Detected	0.0434
Mean of Detected Logged Data	-2.733	SD of Detected Logged Data	0.423

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.624
1% Shapiro Wilk Critical Value	0.851
Lilliefors Test Statistic	0.296

Shapiro Wilk GOF Test

Data Not Normal at 1% Significance Level

Lilliefors GOF Test

1% Lilliefors Critical Value 0.241 Data Not Normal at 1% Significance Level

Data Not Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0609	KM SD	0.0395
95% UTL95% Coverage	0.152	95% KM UPL (t)	0.13
90% KM Percentile (z)	0.112	95% KM Percentile (z)	0.126
99% KM Percentile (z)	0.153	95% KM USL	0.165

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0563	SD	0.0441
95% UTL95% Coverage	0.158	95% UPL (t)	0.133
90% Percentile (z)	0.113	95% Percentile (z)	0.129
99% Percentile (z)	0.159	95% USL	0.173

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.021
5% A-D Critical Value	0.742
K-S Test Statistic	0.216
5% K-S Critical Value	0.21

Anderson-Darling GOF Test

Data Not Gamma Distributed at 5% Significance Level

Kolmogorov-Smirnov GOF

Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	5.026	k star (bias corrected MLE)	4.178
Theta hat (MLE)	0.0143	Theta star (bias corrected MLE)	0.0172
nu hat (MLE)	170.9	nu star (bias corrected)	142.1
MLE Mean (bias corrected)	0.0721		
MLE Sd (bias corrected)	0.0353	95% Percentile of Chisquare (2kstar)	16.01

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
 GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
 For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	0.0547
Maximum	0.228	Median	0.0564
SD	0.0456	CV	0.833
k hat (MLE)	1.725	k star (bias corrected MLE)	1.537
Theta hat (MLE)	0.0317	Theta star (bias corrected MLE)	0.0356
nu hat (MLE)	82.81	nu star (bias corrected)	73.79
MLE Mean (bias corrected)	0.0547	MLE Sd (bias corrected)	0.0441
95% Percentile of Chisquare (2kstar)	7.944	90% Percentile	0.113
95% Percentile	0.141	99% Percentile	0.204

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.196	0.21	95% Approx. Gamma UPL	0.146	0.151
95% Gamma USL	0.231	0.252			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.0609	SD (KM)	0.0395
Variance (KM)	0.00156	SE of Mean (KM)	0.00832
k hat (KM)	2.372	k star (KM)	2.103
nu hat (KM)	113.9	nu star (KM)	101
theta hat (KM)	0.0257	theta star (KM)	0.0289
80% gamma percentile (KM)	0.0906	90% gamma percentile (KM)	0.117
95% gamma percentile (KM)	0.142	99% gamma percentile (KM)	0.198

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.149	0.15	95% Approx. Gamma UPL	0.121	0.12
95% KM Gamma Percentile	0.116	0.115	95% Gamma USL	0.168	0.17

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.882	Shapiro Wilk GOF Test
10% Shapiro Wilk Critical Value	0.91	Data Not Lognormal at 10% Significance Level
Lilliefors Test Statistic	0.179	Lilliefors GOF Test
10% Lilliefors Critical Value	0.19	Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Approximate Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.0588	Mean in Log Scale	-3.002
SD in Original Scale	0.042	SD in Log Scale	0.567
95% UTL95% Coverage	0.184	95% BCA UTL95% Coverage	0.228
95% Bootstrap (%) UTL95% Coverage	0.228	95% UPL (t)	0.134
90% Percentile (z)	0.103	95% Percentile (z)	0.126
99% Percentile (z)	0.186	95% USL	0.223

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-2.926	95% KM UTL (Lognormal)95% Coverage	0.155
KM SD of Logged Data	0.459	95% KM UPL (Lognormal)	0.12
95% KM Percentile Lognormal (z)	0.114	95% KM USL (Lognormal)	0.181

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0563	Mean in Log Scale	-3.111
SD in Original Scale	0.0441	SD in Log Scale	0.704
95% UTL95% Coverage	0.227	95% UPL (t)	0.153
90% Percentile (z)	0.11	95% Percentile (z)	0.142
99% Percentile (z)	0.229	95% USL	0.287

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs (no distinction made between detects and nondetects)

Order of Statistic, r	24	95% UTL with95% Coverage	0.228
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Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
Approximate Sample Size needed to achieve specified CC	59	95% UPL	0.196
95% USL	0.228	95% KM Chebyshev UPL	0.237

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Radium-226/228

General Statistics

Total Number of Observations	24	Number of Missing Observations	0
Number of Distinct Observations	24		
Number of Detects	23	Number of Non-Detects	1
Number of Distinct Detects	23	Number of Distinct Non-Detects	1
Minimum Detect	0.772	Minimum Non-Detect	1.95
Maximum Detect	5.81	Maximum Non-Detect	1.95
Variance Detected	1.378	Percent Non-Detects	4.167%
Mean Detected	2.98	SD Detected	1.174
Mean of Detected Logged Data	1.01	SD of Detected Logged Data	0.438

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.309	d2max (for USL)	2.644
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Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.971	Shapiro Wilk GOF Test
1% Shapiro Wilk Critical Value	0.881	Detected Data appear Normal at 1% Significance Level
Lilliefors Test Statistic	0.103	Lilliefors GOF Test
1% Lilliefors Critical Value	0.209	Detected Data appear Normal at 1% Significance Level

Detected Data appear Normal at 1% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	2.917	KM SD	1.167
95% UTL95% Coverage	5.612	95% KM UPL (t)	4.959
90% KM Percentile (z)	4.413	95% KM Percentile (z)	4.837
99% KM Percentile (z)	5.633	95% KM USL	6.003

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	2.897	SD	1.219
95% UTL95% Coverage	5.711	95% UPL (t)	5.029
90% Percentile (z)	4.459	95% Percentile (z)	4.901
99% Percentile (z)	5.732	95% USL	6.119

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.185	Anderson-Darling GOF Test
5% A-D Critical Value	0.746	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0829	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.182	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	6.237	k star (bias corrected MLE)	5.453
Theta hat (MLE)	0.478	Theta star (bias corrected MLE)	0.547
nu hat (MLE)	286.9	nu star (bias corrected)	250.8
MLE Mean (bias corrected)	2.98		
MLE Sd (bias corrected)	1.276	95% Percentile of Chisquare (2kstar)	19.55

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
 GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)

For such situations, GROS method may yield incorrect values of UCLs and BTVs

This is especially true when the sample size is small.

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.772	Mean	2.916
Maximum	5.81	Median	2.7

SD	1.19	CV	0.408
k hat (MLE)	5.893	k star (bias corrected MLE)	5.184
Theta hat (MLE)	0.495	Theta star (bias corrected MLE)	0.563
nu hat (MLE)	282.9	nu star (bias corrected)	248.8
MLE Mean (bias corrected)	2.916	MLE Sd (bias corrected)	1.281
95% Percentile of Chisquare (2kstar)	18.81	90% Percentile	4.631
95% Percentile	5.292	99% Percentile	6.686

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	6.478	6.67	95% Approx. Gamma UPL	5.379	5.469
95% Gamma USL	7.202	7.477			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.917	SD (KM)	1.167
Variance (KM)	1.363	SE of Mean (KM)	0.245
k hat (KM)	6.245	k star (KM)	5.492
nu hat (KM)	299.7	nu star (KM)	263.6
theta hat (KM)	0.467	theta star (KM)	0.531
80% gamma percentile (KM)	3.881	90% gamma percentile (KM)	4.582
95% gamma percentile (KM)	5.219	99% gamma percentile (KM)	6.56

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	6.427	6.621	95% Approx. Gamma UPL	5.344	5.436
95% KM Gamma Percentile	5.157	5.234	95% Gamma USL	7.14	7.417

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.95	Shapiro Wilk GOF Test
10% Shapiro Wilk Critical Value	0.928	Detected Data appear Lognormal at 10% Significance Level

Lilliefors Test Statistic 0.111
 10% Lilliefors Critical Value 0.165

Lilliefors GOF Test

Detected Data appear Lognormal at 10% Significance Level

Detected Data appear Lognormal at 10% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	2.918	Mean in Log Scale	0.984
SD in Original Scale	1.188	SD in Log Scale	0.446
95% UTL95% Coverage	7.499	95% BCA UTL95% Coverage	5.81
95% Bootstrap (%) UTL95% Coverage	5.81	95% UPL (t)	5.841
90% Percentile (z)	4.74	95% Percentile (z)	5.575
99% Percentile (z)	7.558	95% USL	8.709

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.981	95% KM UTL (Lognormal)95% Coverage	7.486
KM SD of Logged Data	0.447	95% KM UPL (Lognormal)	5.829
95% KM Percentile Lognormal (z)	5.564	95% KM USL (Lognormal)	8.694

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	2.897	Mean in Log Scale	0.967
SD in Original Scale	1.219	SD in Log Scale	0.478
95% UTL95% Coverage	7.919	95% UPL (t)	6.061
90% Percentile (z)	4.848	95% Percentile (z)	5.767
99% Percentile (z)	7.985	95% USL	9.293

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution

Nonparametric Upper Limits for BTVs (no distinction made between detects and nondetects)

Order of Statistic, r	24	95% UTL with95% Coverage	5.81
Approx, f used to compute achieved CC	1.263	Approximate Actual Confidence Coefficient achieved by UTL	0.708
Approximate Sample Size needed to achieve specified CC	59	95% UPL	5.648
95% USL	5.81	95% KM Chebyshev UPL	8.11

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20. Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Appendix B

Background Data Set for October 2023 Semiannual Detection Monitoring Event

Appendix B Background Data Set for October 2023 Semiannual Detection Monitoring Event

EVENT	WELL	CONSTITUENT/RESULT						
		BORON (µg/L)	CALCIUM (µg/L)	CHLORIDE (mg/L)	FLUORIDE (mg/L)	FIELD pH (S.U.)	SULFATE (mg/L)	TDS (mg/L)
BL-1	AS-LF-01	16.0	4,470	3.79	0.0791 J	4.80	18.9	16.0
BL-2	AS-LF-01	13.6 J	2,670	2.56	0.0577 J	4.50	13.9	24.0 J
BL-3	AS-LF-01	9.13 J	3,570	3.66	0.0992 J	4.57	15.0	11.0
BL-4	AS-LF-01	15.7	2,700	1.94	0.0606 J	4.44	15.0	5.00 J
BL-5	AS-LF-01	14.1 J	2,010	3.05	0.0620 J	4.43	9.33	8.00 J
BL-6	AS-LF-01	15.6	11,200	9.22	0.228	4.21	37.4	54.0
BL-7	AS-LF-01	16.2	2,430	3.35	< 0.0330	4.36	9.49	3.00
BL-8	AS-LF-01	16.6	2,260	3.02	0.0426 J	4.30	12.8	5.00
BL-1	AS-LF-02	20.2	3,300	7.39	0.0642 J	4.76	14.1	13.0
BL-2	AS-LF-02	17.2	3,660	6.39	0.0729 J	4.54	14.1	25.0
BL-3	AS-LF-02	12.2 J	3,280	8.05	0.0815 J	4.46	10.3	12.0
BL-4	AS-LF-02	20.3	4,350	6.09	0.0649 J	4.52	17.1	8.00 J
BL-5	AS-LF-02	23.1	4,520	5.55	0.0586 J	4.44	18.7	18.0
BL-6	AS-LF-02	22.4	3,820	6.60	0.0550 J	4.45	15.6	21.0
BL-7	AS-LF-02	27.2	3,960	6.16	< 0.0330	4.43	12.6	12.0
BL-8	AS-LF-02	28.3	3,670	5.47	0.0760 J	4.42	16.5	12.0
BL-1	MW-LF-01	7.37 J	2,090	8.32	< 0.0330	4.75	0.418	< 2.38
BL-2	MW-LF-01	6.78 J	2,070	7.54	< 0.0330	4.53	0.260 J	5.00 J
BL-3	MW-LF-01	6.98 J	1,980	7.60	< 0.0566	4.55	0.269 J	< 2.38

Appendix B Background Data Set for October 2023 Semiannual Detection Monitoring Event

EVENT	WELL	CONSTITUENT/RESULT						
		BORON (µg/L)	CALCIUM (µg/L)	CHLORIDE (mg/L)	FLUORIDE (mg/L)	FIELD pH (S.U.)	SULFATE (mg/L)	TDS (mg/L)
BL-4	MW-BG-06	7.23 J	2,090	8.37	0.0488 J	4.39	0.240 J	< 2.38
BL-5	MW-BG-06	7.07 J	1,940	7.84	< 0.0330	4.42	0.304 J	< 2.38
BL-6	MW-BG-06	8.12 J	1,980	8.88	0.0394 J	4.40	0.579	5.00 J
BL-7	MW-BG-06	9.22 J	2,020	8.83	< 0.0330	4.31	0.241 J	< 2.38
BL-8	MW-BG-06	7.83 J	1,950	8.75	0.0344 J	4.27	0.856	7.00 J

pH expressed in standard units (S.U.).

TDS = Total dissolved solids.

µg/L = micrograms per liter.

mg/L = milligrams per liter.

BL = Baseline sampling event.

J Estimated concentration.

< Result less than the indicated detection limit.

References

OBG 2017. *Statistical Analysis Plan – SCE&G Cope Station Class III Landfill, Cope, South Carolina*. O’Brein & Gere Inc. (OBG), October 17, 2017.

TRC 2023a. *Class III Landfill Groundwater Monitoring System Certification per 40 CFR 257.91 (f), Cope Generating Station, Cope, South Carolina*. TRC Environmental Corporation (TRC), September 29, 2023.