

Annual Groundwater Monitoring and Corrective Action Report

Appalachian Power Company
Clinch River Plant
Pond 1 CCR Management Unit
Cleveland, Virginia

January 31, 2024

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An **AEP** Company

BOUNDLESS ENERGYSM

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Abbreviations:

ASD - Alternate Source Demonstration
CCR – Coal Combustion Residual
GWPS - Groundwater protection standards
SSI - Statistically Significant Increase
SSL - Statistically Significant Level

I. Overview

This *Annual Groundwater Monitoring and Corrective Action Report* (Report) has been prepared to report the status of activities for the preceding year for an inactive surface impoundment CCR unit at Appalachian Power Company's, a wholly-owned subsidiary of American Electric Power Company (AEP) Clinch River Power Plant. The USEPA's CCR rules require that the Annual Groundwater Monitoring and Corrective Action Report be posted to the operating record by August 1, 2019 and annually thereafter for inactive surface impoundments. This report is being prepared by January 31, 2024 to cover groundwater monitoring activities in 2023.

In general, the following activities were completed:

- At the start of the current annual monitoring period, Pond 1 was operating under the assessment monitoring program.
- At the end of the current annual reporting period, Pond 1 was operating under the assessment monitoring program.
- An assessment monitoring program was established for Pond 1 on July 15, 2019.
- On October 13, 2019 an Assessment of Corrective Measures (ACM) for Pond 1 was initiated. The ACM was completed on December 11, 2019, and a public meeting to discuss the proposed remedies was held on December 19, 2019.
- Two semi-annual progress report on selecting a remedy pursuant to §257.97 were completed on January 18, 2023 and July 18, 2023. A remedy has not yet been selected.
- Data and statistical analysis not available from the previous reporting period indicates that during the October 2022 sampling event:
 - The following Appendix IV parameters exceeded the groundwater protection standards:
 - Barium at wells MW-1603, MW-1604, and MW-1612
 - Cobalt in wells MW-1607
 - Lithium at wells MW-1605, MW-1606, MW-1607, and MW-1610
 - Molybdenum at wells MW-1607 and MW-1610
 - The following Appendix III parameters exceeded background concentrations:
 - Calcium at wells MW-1603, MW-1604, MW-1605, and MW-1612
 - Chloride at wells MW-1603, MW-1605, MW-1606, and MW-1607
 - Sulfate at wells MW-1606 and MW-1607
 - pH at wells MW-1603, MW-1604, W-1610, and MW-1612

- During the April 2023 semi-annual sampling event
 - The following Appendix IV parameters exceeded established groundwater protection standards:
 - Barium at wells MW-1603, MW-1604, MW-1605, and MW-1612
 - Cobalt in wells MW-1607
 - Lithium at wells MW-1605, MW-1606, and MW-1607
 - Molybdenum at wells MW-1607 and MW-1610
 - The following Appendix III parameters exceeded background:
 - Calcium in wells MW-1603, MW-1604, MW-1605, and MW-1612
 - Chloride in wells MW-1603, MW-1605, MW-1606, and MW-1607
 - Sulfate in wells MW-1606 and MW-1607
 - pH in wells MW-1603 and MW-1612
- The October 2023 data are still undergoing statistical analysis.

The major components of this annual report, to the extent currently applicable, are presented in sections that follow:

- A map, aerial photograph or a drawing showing the CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers (Attached as **Appendix 1**);
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of background, detection monitoring, or assessment monitoring programs (Attached as **Appendix 1**);
- Statistical comparison of monitoring data to determine if there have been significant increase over background concentrations (Attached as **Appendix 2**, where applicable);
- A discussion of whether any alternate source demonstrations were performed, and the conclusions (Attached as **Appendix 3**, where applicable);
- A summary of any transition between monitoring programs, for example the date and circumstances for transitioning from detection monitoring to assessment monitoring, in addition to identifying the constituents detected at a statistically significant increase over background concentrations (Notices Attached as **Appendix 4**, where applicable);
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened (Attached as **Appendix 5**, where applicable); and

- Other information required to be included in the annual report, if applicable.

In addition, this report summarizes key actions completed, and where applicable, describes any problems encountered and actions taken to resolve those problems. The report includes a projection of key activities for the upcoming year.

II. Groundwater Monitoring Well Locations and Identification Numbers

There are three hydrogeological formations monitored at the facility: the Rome, Chattanooga, and Dumps Fault. The following is a list of wells (S = Shallow zone, D = Deep zone):

Rome Formation

Upgradient wells: MW-1609

Downgradient wells: MW-1606 and MW-1607

Nature and Extent wells: W-1906(S, D); W-1907(S, D), W-1913(S, D)

Chattanooga Formation

Upgradient wells: MW-1601; MW1602; and MW-1608

Downgradient wells: MW-1603; MW-1604; MW-1605; and MW-1612

Nature and Extent wells: W-1903(S, D); W-1904(S, D); W-1905(S, D); W-2012(S, D); W-2201(S, D); W-2202(S, D); and W-2203(S, D)

Dumps Fault Formation

Upgradient wells: MW-1611 and W-2204

Downgradient wells: MW-1610

Nature and Extent wells: W-1910S

A figure that depicts the PE-certified groundwater monitoring network, the monitoring well locations and their corresponding identification numbers is provided in **Appendix 1**.

III. Monitoring Wells Installed or Decommissioned

The network design, as summarized in the *Groundwater Monitoring Network Design Report* (2019) and as posted at the CCR website for Clinch River Plant, did not change. That design report discusses the facility location, the hydrogeological setting, the hydrostratigraphic units, the uppermost aquifer, downgradient monitoring well locations and the upgradient monitoring well locations.

Since the facility entered assessment monitoring and no alternative source was identified, 13 monitoring wells were installed after initiating the assessment of corrective measures in 2019 to define the horizontal and vertical extent of constituents exceeding the groundwater protections

standards at statistically significant levels. Six clusters of shallow and deep wells, and one shallow well were installed near Dumps Creek and the Clinch River downgradient of the ash pond. The monitoring wells installed at the end of 2019 and were documented in the 2019 annual report.

In 2020, two additional monitoring wells were installed to help define the extent of the plume. The monitoring well installation reports for those two wells were included in the 2020 annual report.

In 2022, seven additional monitoring wells were installed. Six of the monitoring wells were nature and extent wells installed in the Chattanooga Shale. One monitoring well was installed upgradient in the Dumps Fault. The boring logs and well construction certifications were included in the 2022 annual report.

IV. Groundwater Quality Data and Static Water Elevation Data, With Flow Rate and Direction Calculations and Discussion

Appendix 1 contains tables showing the groundwater quality data collected during the establishment of background quality, detection, and assessment monitoring. Static water elevation data from each monitoring event also are shown in **Appendix 1**, along with the groundwater velocity calculations, groundwater flow direction and potentiometric maps developed after each sampling event.

The sampling event conducted in February 2023 satisfies the requirement of 257.95(b).

V. Groundwater Quality Data Statistical Analysis

Appendix 2 contains the statistical analysis report(s).

- Data and statistical analysis not available from the previous reporting period indicates that during the October 2022 sampling event:
 - The following Appendix IV parameters exceeded the groundwater protection standards:
 - Barium at wells MW-1603, MW-1604, and MW-1612
 - Cobalt in wells MW-1607
 - Lithium at wells MW-1605, MW-1606, MW-1607, and MW-1610
 - Molybdenum at wells MW-1607 and MW-1610
 - The following Appendix III parameters exceeded background concentrations:
 - Calcium at wells MW-1603, MW-1604, MW-1605, and MW-1612
 - Chloride at wells MW-1603, MW-1605, MW-1606, and MW-1607
 - Sulfate at wells MW-1606 and MW-1607
 - pH at wells MW-1603, MW-1604, W-1610, and MW-1612

- During the April 2023 semi-annual sampling event
 - The following Appendix IV parameters exceeded established groundwater protection standards:
 - Barium at wells MW-1603, MW-1604, MW-1605, and MW-1612
 - Cobalt in wells MW-1607
 - Lithium at wells MW-1605, MW-1606, and MW-1607
 - Molybdenum at wells MW-1607 and MW-1610
 - The following Appendix III parameters exceeded background:
 - Calcium in wells MW-1603, MW-1604, MW-1605, and MW-1612
 - Chloride in wells MW-1603, MW-1605, MW-1606, and MW-1607
 - Sulfate in wells MW-1606 and MW-1607
 - pH in wells MW-1603 and MW-1612
- The October 2023 sampling event's data are still undergoing statistical analysis.

Appendix 2 also contains a memorandum that explains the reissuance of select analytical laboratory reports to correct laboratory equipment data quality assurance/quality control issues.

VI. Alternative Source Demonstrations Completed

No alternative source for the groundwater protection standard, or background concentration exceedances has been found at Pond 1, and the CCR unit remains in assessment monitoring and remedies are being evaluated for selection as corrective measures.

VII. Discussion About Transition Between Monitoring Requirements or Alternate Monitoring Frequency

A notification that Pond 1 established an assessment monitoring program was placed in the Operating Record on August 1, 2019 in accordance with the requirement of 257.94(e)(3). Pond 1 also initiated and completed an Assessment of Corrective Measures by December 11, 2019. A public meeting was held on December 19, 2019 to discuss the proposed remedies.

As of the writing of this report, there has been no remedy selected pursuant to § 257.97. Two semi-annual reports discussing the progress towards selecting a remedy were prepared during this monitoring period. The CCR Unit will continue to sample according to the assessment monitoring program.

Regarding defining an alternate monitoring frequency, the groundwater velocity and monitoring well production are high enough at this facility that no modification to the semiannual assessment monitoring frequency is needed.

VIII. Other Information Required

Pond 1 has progressed from detection monitoring to its current status in assessment monitoring. As required by the CCR assessment monitoring rules in 40 CFR 257.95 (b) and (d)(1), sampling all CCR wells for the required Appendix III and IV parameters was completed in 2023.

IX. Description of Any Problems Encountered and Actions Taken

No significant problems were encountered. The low flow sampling effort went smoothly and the schedule was met to support the annual groundwater report preparation.

X. A Projection of Key Activities for the Upcoming Year

Key activities for 2024 include:

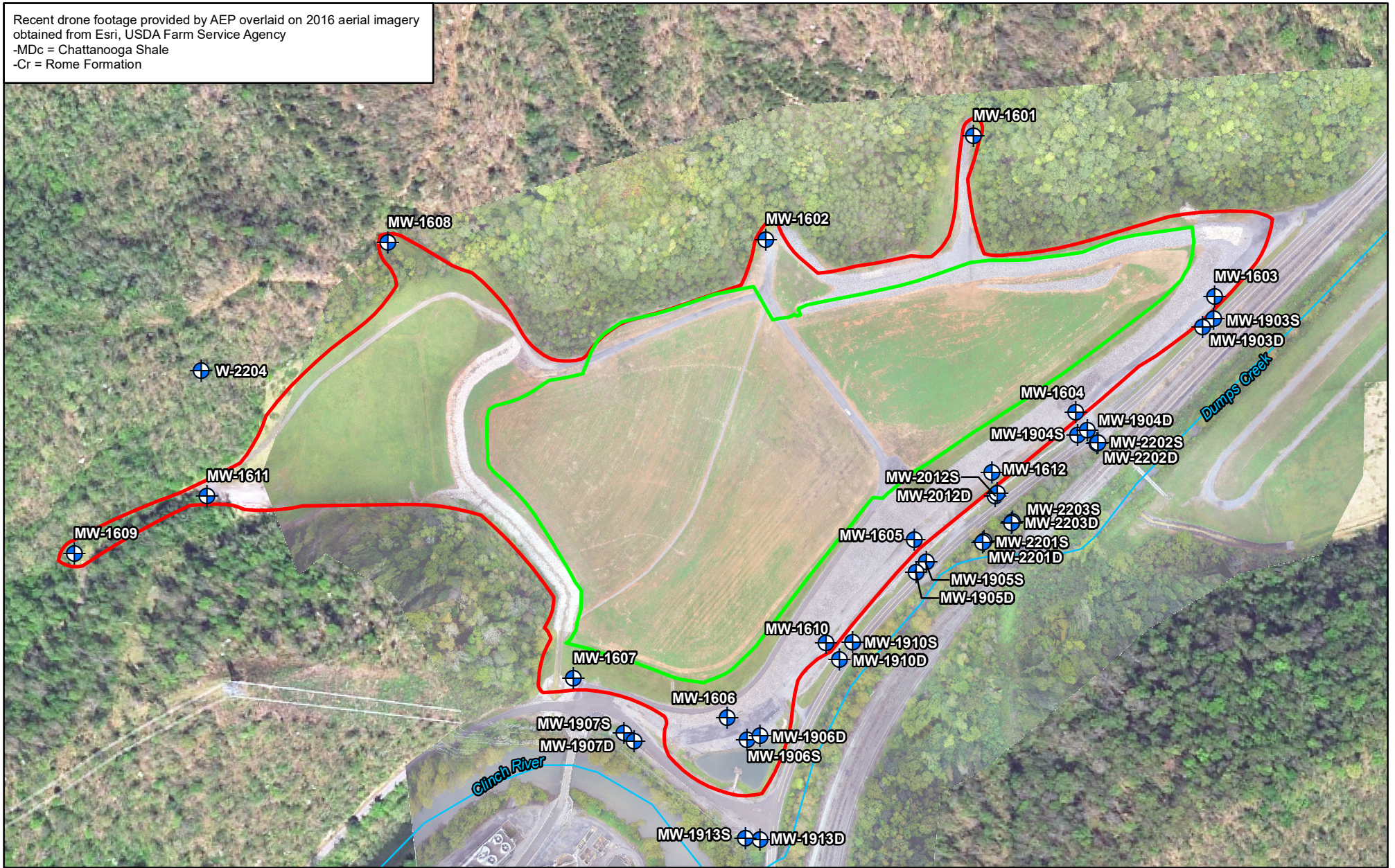
- Complete the statistical evaluation of the second semi-annual groundwater monitoring event that took place in October 2023.
- Conduct the annual groundwater sampling event for all constituents listed in appendix III and IV as required by 40 CFR 257.95(b).
- Perform statistical analysis on the sampling results for the Appendix III and Appendix IV parameters as required by 40 CFR 257.95(d)(1).
- Determine applicable GWPSs for the Appendix IV parameters and compare the results of Appendix IV concentrations in downgradient wells to the GWPSs.
- Semi-annual progress report on selecting and designing remedial corrective action.
- Responding to any new data received considering CCR rule requirements.
- Preparation of the next annual groundwater report.

APPENDIX 1 – Groundwater Data Tables and Figures

Figures and Tables follow, showing the groundwater monitoring network, data collected and the rate and direction of groundwater flow. The dates that the samples were collected, and it also is shown whether the data were collected under background, detection, or assessment monitoring.

Groundwater Monitoring Network Figure

Recent drone footage provided by AEP overlaid on 2016 aerial imagery obtained from Esri, USDA Farm Service Agency
 -MDC = Chattanooga Shale
 -Cr = Rome Formation



SYMBOL KEY





-  Monitoring Well
-  Pond 1 VA Permit SWP620 Boundary
-  Pond 1 CCR Unit Boundary
-  Stream/Surface Water



FIGURE 1
Pond 1 Groundwater Monitoring Network
 American Electric Power, Clinch River Plant Carbo, Virginia



08/29/2022	AEP_Pond1	
PROJ: 3050190394	Drawn: BF	

Groundwater Data Tables

**Table 1. Groundwater Data Summary: MW-1601
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.447	5.58	23.8	1.86	7.8	166	1,180
12/12/2017	Background	0.473	5.88	31.9	1.82	8.3	250	1,340
2/13/2018	Background	0.496	5.99	30.8	2.13	8.4	248	1,380
4/11/2018	Background	0.514	7.49	41.0	2.10	8.3	319	1,620
6/7/2018	Background	0.576	6.34	31.4	2.22	8.4	245	1,440
8/20/2018	Background	0.517	8.42	45.8	2.10	8.3	358	1,730
10/17/2018	Background	0.542	6.84	34.3	2.20	8.5	258	1,500
12/6/2018	Background	0.593	5.65	28.1	2.22	8.5	210	1,410
2/7/2019	Detection	0.526	5.50	24.0	2.32	8.4	184	1,370
4/8/2019	Assessment	0.577	5.90	25.2	2.18	8.4	173	1,390
5/28/2019	Assessment	0.541	5.21	24.3	1.89	8.7	181	1,390
10/1/2019	Assessment	0.609	6.90	33.2	2.09	8.3	250	1,480
2/10/2020	Assessment	0.563	4.94	20.5	1.75	8.7	168	1,350
4/20/2020	Assessment	0.523	4.95	18.9	2.35	8.2	162	1,320
10/6/2020	Assessment	0.589	5.60	27.1	2.10	8.2	214	1,460
2/8/2021	Assessment	0.549	4.83	23.1	2.40	8.2	185	1,360
4/12/2021	Assessment	0.527	5.68	22.5	2.42	8.5	188	1,480
10/11/2021	Assessment	0.550	5.4	18.9	2.30	8.6	156	1,360
2/22/2022	Assessment	0.531	5.14 M1	24.6	2.29	8.8	302	1,580
4/12/2022	Assessment	0.549	4.72	16.8	2.37	8.2	154	1,340
10/3/2022	Assessment	0.591	6.96	21.1	2.31	8.2	231	1,610
2/13/2023	Assessment	0.534	5.11	23.7	2.32	8.2	270	1,560
4/3/2023	Assessment	0.538	5.20	17.0	2.39	6.7	168	1,360
10/9/2023	Assessment	0.489	4.30	20.7	2.17	8.3	244	1,430

Table 1. Groundwater Data Summary: MW-1601

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.18	9.18	238	< 0.004 U1	< 0.005 U1	0.221	0.112	1.204	1.86	0.070	0.095	< 0.05 U1	25.7	0.04 J1	0.02 J1
12/12/2017	Background	0.19	8.39	306	0.007 J1	0.009 J1	0.281	0.149	2.077	1.82	0.153	0.092	0.08 J1	21.9	0.06 J1	< 0.01 U1
2/13/2018	Background	0.11	7.06	280	0.007 J1	< 0.005 U1	0.155	0.091	1.01	2.13	0.125	0.098	< 0.05 U1	12.0	0.05 J1	0.04 J1
4/11/2018	Background	0.12	14.9	293	0.007 J1	< 0.005 U1	0.544	0.092	0.862	2.10	0.096	0.110	0.05 J1	6.60	0.07 J1	0.01 J1
6/7/2018	Background	0.16	17.0	262	0.005 J1	0.006 J1	0.279	0.062	1.146	2.22	0.072	0.118	< 0.05 U1	3.77	< 0.03 U1	0.01 J1
8/20/2018	Background	0.25	25.8	296	0.005 J1	< 0.005 U1	0.402	0.099	0.711	2.10	0.047	0.108	< 0.05 U1	3.79	0.06 J1	0.01 J1
10/17/2018	Background	0.20	24.7	222	< 0.02 U1	< 0.01 U1	0.217	0.074	3.229	2.20	0.03 J1	0.098	< 0.05 U1	3.00	0.04 J1	< 0.1 U1
12/6/2018	Background	0.15	17.8	191	< 0.02 U1	< 0.01 U1	0.235	0.061	0.871	2.22	0.06 J1	0.092	< 0.05 U1	3.34	< 0.03 U1	< 0.1 U1
2/7/2019	Detection	0.17	17.8	176	< 0.02 U1	0.01 J1	0.292	0.072	0.157	2.32	0.08 J1	0.099	< 0.05 U1	2.85	< 0.03 U1	< 0.1 U1
4/8/2019	Assessment	0.15	21.7	184	< 0.02 U1	0.02 J1	0.258	0.072	0.337	2.18	0.07 J1	0.111	0.05 J1	1 J1	0.04 J1	< 0.1 U1
5/28/2019	Assessment	0.11	18.4	179	< 0.02 U1	< 0.01 U1	0.288	0.064	0.939	1.89	0.02 J1	0.090	0.1 J1	1 J1	< 0.03 U1	< 0.1 U1
10/1/2019	Assessment	0.11	21.1	239	< 0.02 U1	< 0.01 U1	0.291	0.088	0.481	2.09	< 0.05 U1	0.108	< 0.2 U1	1 J1	0.05 J1	< 0.1 U1
2/10/2020	Assessment	0.07 J1	10.1	156	< 0.02 U1	< 0.01 U1	0.231	0.073	2.076	1.75	< 0.05 U1	0.0901	< 0.2 U1	1 J1	0.04 J1	< 0.1 U1
4/20/2020	Assessment	0.09 J1	11.5	152	< 0.02 U1	< 0.01 U1	0.242	0.093	2.257	2.35	0.05 J1	0.0904	< 0.2 U1	1 J1	0.06 J1	< 0.1 U1
10/6/2020	Assessment	0.06 J1	11.4	172	< 0.02 U1	< 0.01 U1	0.2 J1	0.080	0.618	2.10	0.1 J1	0.0939	< 0.2 U1	2.10	0.06 J1	< 0.1 U1
2/8/2021	Assessment	0.06 J1	7.91	152	< 0.02 U1	< 0.01 U1	0.263	0.078	0.645	2.40	< 0.05 U1	0.0938	< 0.2 U1	1 J1	0.09 J1	< 0.1 U1
4/12/2021	Assessment	0.05 J1	8.77	176	< 0.007 U1	< 0.004 U1	0.1 J1	0.057	0.727	2.42	0.08 J1	0.0975	< 0.2 U1	0.9 J1	< 0.09 U1	< 0.04 U1
10/11/2021	Assessment	0.05 J1	7.00	161	< 0.007 U1	< 0.004 U1	0.14 J1	0.066	0.27	2.30	< 0.1 U1	0.0921	< 0.2 U1	0.9	< 0.09 U1	< 0.08 U1
2/22/2022	Assessment	0.02 J1	5.93	171	< 0.007 U1	< 0.004 U1	0.15 J1	0.058	1.03	2.29	< 0.05 U1	0.108 M1, P3	< 0.2 U1	0.9	< 0.09 U1	< 0.04 U1
4/12/2022	Assessment	0.02 J1	4.69	134	< 0.007 U1	< 0.004 U1	0.07 J1	0.052	0.79	2.37	< 0.05 U1	0.0897	< 0.2 U1	0.8	< 0.09 U1	< 0.04 U1
10/3/2022	Assessment	0.02 J1	6.01	175	< 0.007 U1	< 0.004 U1	0.10 J1	0.066	1.19	2.31	< 0.05 U1	0.0964	< 0.2 U1	1.0	< 0.09 U1	< 0.04 U1
2/13/2023	Assessment	0.03 J1	4.47	139	< 0.007 U1	0.004 J1	0.22	0.077	1.62	2.32	0.09 J1	0.0846	< 0.2 U1	0.8	< 0.09 U1	< 0.04 U1
4/3/2023	Assessment	0.023 J1	4.08	127	< 0.007 U1	< 0.004 U1	0.18 J1	0.057	2.47	2.39	0.06 J1	0.106 M1	< 0.2 U1	0.8	< 0.04 U1	< 0.02 U1
10/9/2023	Assessment	0.024 J1	4.22	141	< 0.007 U1	< 0.004 U1	0.28 J1	0.058	1.09 L1, P2	2.17	0.06 J1	0.0926	< 0.2 U1	0.8	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1602
Clinch River - Pond 1
Appendix III Constituents**

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.654	3.09	4.2	1.45	8.0	32.8	525
12/12/2017	Background	0.584	2.64	4.2	1.57	8.7	29.2	516
2/13/2018	Background	0.621	2.93	4.9	1.61	8.5	32.2	528
4/11/2018	Background	0.614	2.78	5.6	1.63	8.7	32.4	500
6/7/2018	Background	0.672	2.74	5.2	1.64	8.6	29.1	525
8/20/2018	Background	0.547	2.84	6.5	1.57	8.5	37.5	567
10/15/2018	Background	0.664	2.94	5.6	1.61	8.6	29.0	544
12/6/2018	Background	0.637	2.78	3.8	1.64	8.7	16.7	500
2/7/2019	Detection	0.590	3.72	4.4	1.69	8.7	20.5	521
4/8/2019	Assessment	0.620	4.00	5.5	1.56	8.6	25.0	571
5/28/2019	Assessment	0.579	3.39	4.4	1.66	8.8	20.4	517
10/1/2019	Assessment	0.640	4.62	5.7	1.54	8.6	29.5	530
2/10/2020	Assessment	0.617	3.07	3.7	1.56	9.2	15.7	504
4/20/2020	Assessment	0.605	3.83	3.9	1.70	8.6	17.4	510
10/6/2020	Assessment	0.633	3.78	5.3	1.57	8.5	24.5	527
2/8/2021	Assessment	0.610	3.70	3.9	1.76	8.4	16.1	539
4/12/2021	Assessment	0.600	3.73	4.6	1.77	8.6	20.3	522
10/11/2021	Assessment	0.578	4.3	4.56	1.65	8.5	20.2	520
2/22/2022	Assessment	0.590	3.25	4.94	1.73	8.8	25.1	530
4/12/2022	Assessment	0.629	3.22	3.54	1.74	8.1	15.2	510
10/3/2022	Assessment	0.632	4.66	4.94	1.70	7.3	25.1	510
2/13/2023	Assessment	0.597	3.53	4.09	1.76	8.5	17.1	510
4/3/2023	Assessment	0.591	3.24	3.94	1.76	7.2	15.2	510
10/9/2023	Assessment	0.526	3.17	4.91	1.62	8.5	22.0	520

Table 1. Groundwater Data Summary: MW-1602

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.22	2.69	104	0.01 J1	< 0.005 U1	0.472	0.151	0.6	1.45	0.185	0.051	< 0.05 U1	9.80	0.04 J1	0.02 J1
12/12/2017	Background	0.12	2.15	111	0.01 J1	< 0.005 U1	0.291	0.100	0.6097	1.57	0.114	0.043	< 0.05 U1	7.77	< 0.03 U1	< 0.01 U1
2/13/2018	Background	0.07	3.54	111	0.008 J1	< 0.005 U1	0.153	0.060	0.748	1.61	0.093	0.043	< 0.05 U1	8.70	< 0.03 U1	0.03 J1
4/11/2018	Background	0.07	2.90	109	0.006 J1	< 0.005 U1	0.268	0.047	0.18727	1.63	0.140	0.040	< 0.05 U1	6.41	< 0.03 U1	< 0.01 U1
6/7/2018	Background	0.07	2.16	109	0.007 J1	< 0.005 U1	0.262	0.041	0.8588	1.64	0.062	0.045	< 0.05 U1	3.99	< 0.03 U1	< 0.01 U1
8/20/2018	Background	0.13	3.69	114	< 0.004 U1	0.03	0.245	0.042	0.4565	1.57	0.126	0.034	< 0.05 U1	4.84	< 0.03 U1	0.01 J1
10/15/2018	Background	0.06 J1	2.95	101	< 0.02 U1	< 0.01 U1	0.251	0.03 J1	0.2328	1.61	0.06 J1	0.032	< 0.05 U1	3.27	< 0.03 U1	< 0.1 U1
12/6/2018	Background	0.05 J1	1.49	106	< 0.02 U1	< 0.01 U1	0.246	0.04 J1	1.247	1.64	0.05 J1	0.048	< 0.05 U1	2.87	< 0.03 U1	< 0.1 U1
2/7/2019	Detection	0.08 J1	1.88	106	< 0.02 U1	< 0.01 U1	0.231	0.04 J1	0.2875	1.69	0.04 J1	0.045	< 0.05 U1	4.66	0.04 J1	< 0.1 U1
4/8/2019	Assessment	0.09 J1	2.02	103	< 0.02 U1	< 0.01 U1	0.2 J1	0.03 J1	0.135	1.56	0.05 J1	0.043	< 0.05 U1	4.76	< 0.03 U1	< 0.1 U1
5/28/2019	Assessment	0.07 J1	1.67	106	< 0.02 U1	< 0.01 U1	0.2 J1	0.02 J1	0.0613	1.66	0.03 J1	0.036	0.1 J1	3.70	< 0.03 U1	< 0.1 U1
10/1/2019	Assessment	0.09 J1	1.92	109	< 0.02 U1	< 0.01 U1	0.2 J1	0.02 J1	0.701	1.54	< 0.05 U1	0.0419	< 0.2 U1	4.21	< 0.03 U1	< 0.1 U1
2/10/2020	Assessment	0.04 J1	1.52	99.6	< 0.02 U1	< 0.01 U1	0.2 J1	0.060	1.37	1.56	< 0.05 U1	0.0386	< 0.2 U1	2 J1	< 0.03 U1	< 0.1 U1
4/20/2020	Assessment	0.05 J1	1.21	102	< 0.02 U1	< 0.01 U1	0.1 J1	0.02 J1	0.673	1.70	< 0.05 U1	0.0382	< 0.2 U1	2.52	0.06 J1	< 0.1 U1
10/6/2020	Assessment	0.23	2.03	107	< 0.02 U1	< 0.01 U1	0.329	0.04 J1	0.6456	1.57	0.08 J1	0.0373	< 0.2 U1	2.41	0.05 J1	< 0.1 U1
2/8/2021	Assessment	0.53	1.39	103	< 0.02 U1	< 0.01 U1	0.2 J1	0.03 J1	0.419	1.76	< 0.05 U1	0.0378	< 0.2 U1	2 J1	0.04 J1	< 0.1 U1
4/12/2021	Assessment	0.54	1.69	98.7	< 0.01 U1	< 0.004 U1	0.06 J1	0.02 J1	0.892	1.77	< 0.05 U1	0.0476	< 0.2 U1	2 J1	< 0.09 U1	< 0.04 U1
10/11/2021	Assessment	0.35	1.61	100	< 0.007 U1	< 0.004 U1	0.07 J1	0.023	0.51	1.65	< 0.05 U1	0.0350	< 0.2 U1	1.4	< 0.09 U1	< 0.04 U1
2/22/2022	Assessment	0.14	1.63	97.2	< 0.007 U1	< 0.004 U1	0.12 J1	0.018 J1	1.00	1.73	< 0.05 U1	0.0367	< 0.2 U1	1	< 0.09 U1	< 0.04 U1
4/12/2022	Assessment	0.13	1.27	97.3	< 0.007 U1	< 0.004 U1	< 0.04 U1	0.018 J1	0.72	1.74	< 0.05 U1	0.0375	< 0.2 U1	1	< 0.09 U1	< 0.04 U1
10/3/2022	Assessment	0.13	1.81	98.7	< 0.07 U1	< 0.004 U1	0.11 J1	0.019 J1	0.56	1.70	< 0.05 U1	0.0395	< 0.2 U1	0.9	< 0.09 U1	< 0.04 U1
2/13/2023	Assessment	0.06 J1	1.66	98.4	< 0.007 U1	< 0.004 U1	0.18 J1	0.019 J1	15.74	1.76	< 0.05 U1	0.0347	< 0.2 U1	0.7	< 0.09 U1	< 0.04 U1
4/3/2023	Assessment	0.058 J1	1.47	93.5	< 0.007 U1	< 0.004 U1	0.15 J1	0.021	2.05	1.76	< 0.05 U1	0.0362	< 0.2 U1	0.7	< 0.04 U1	< 0.02 U1
10/9/2023	Assessment	0.049 J1	1.58	83.1	< 0.007 U1	< 0.004 U1	0.18 J1	0.014 J1	0.55 L1, P2	1.62	< 0.05 U1	0.0348	< 0.2 U1	0.6	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1603
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.202	23.3	182	0.17	7.3	45.1	678
12/11/2017	Background	0.193	22.1	121	0.1 J1	7.0	47.3	577
2/14/2018	Background	0.199	22.8	58.3	0.11	6.7	23.0	378
4/12/2018	Background	0.379	24.8	168	0.19	7.8	28.3	599
6/12/2018	Background	0.285	22.8	59.0	0.13	7.6	23.0	408
8/22/2018	Background	0.525	24.4	72.6	0.14	7.8	23.2	448
10/16/2018	Background	0.339	21.6	94.7	0.14	7.8	23.4	472
12/12/2018	Background	0.219	20.6	47.4	0.11	7.0	11.5	339
2/12/2019	Detection	0.177	19.8	59.5	0.11	6.8	8.1	374
4/10/2019	Assessment	0.211	21.7	69.5	0.10	7.2	16.2	434
5/30/2019	Assessment	0.197	20.0	77.0	0.13	7.7	6.2	401
10/2/2019	Assessment	0.313	26.7	124	0.10	7.7	8.7	480
2/11/2020	Assessment	0.362	26.6	162	0.12	8.0	1.9	515
4/21/2020	Assessment	0.256	24.6	128	0.10	6.8	2.3	528
10/7/2020	Assessment	0.300	25.7	171	0.15	7.7	0.6	624
2/9/2021	Assessment	0.345	30.9	184	0.12	7.1	1.9	734
4/13/2021	Assessment	0.374	33.1	263	0.17	7.3	1.6	848
10/12/2021	Assessment	0.252	24.1	127	0.12	7.2	0.63	450
2/23/2022	Assessment	0.279	27.5	169	0.11	7.5	0.80	640
4/13/2022	Assessment	0.244	26.9	109	0.1	7.3	0.75	490
10/5/2022	Assessment	0.269	28.6	122	0.11	7.0	0.46	520
2/14/2023	Assessment	0.233	27.1	137	0.10	6.8	0.41	510
4/4/2023	Assessment	0.199	23.2	106	0.09	6.7	0.3 J1	440
10/10/2023	Assessment	0.166	21.6	93.9	0.1	6.6	0.3 J1	390

Table 1. Groundwater Data Summary: MW-1603

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.04 J1	1.82	2,160	< 0.004 U1	< 0.005 U1	0.214	0.691	3.233	0.17	0.038	0.054	< 0.05 U1	4.71	0.1	0.02 J1
12/11/2017	Background	0.05 J1	1.70	1,950	0.01 J1	< 0.005 U1	0.190	0.541	0.901	0.1 J1	0.021	0.048	0.06 J1	2.55	0.07 J1	0.01 J1
2/14/2018	Background	0.04 J1	1.68	2,070	0.01 J1	< 0.005 U1	0.157	0.451	0.6982	0.11	0.008 J1	0.048	< 0.05 U1	2.12	0.1	0.01 J1
4/12/2018	Background	0.04 J1	1.98	2,250	< 0.004 U1	< 0.005 U1	0.187	0.616	1.091	0.19	0.01 J1	0.093	< 0.05 U1	1.79	0.04 J1	< 0.01 U1
6/12/2018	Background	0.06	2.20	2,140	0.008 J1	< 0.005 U1	0.231	0.795	0.888	0.13	0.009 J1	0.073	< 0.05 U1	1.24	0.06 J1	0.01 J1
8/22/2018	Background	0.07	2.98	2,280	< 0.004 U1	< 0.005 U1	0.324	0.776	1.103	0.14	0.02 J1	0.095	< 0.05 U1	1.51	0.05 J1	0.01 J1
10/16/2018	Background	< 0.02 U1	2.89	1,980	< 0.02 U1	< 0.01 U1	0.226	0.684	0.383	0.14	< 0.02 U1	0.064	< 0.05 U1	1 J1	0.08 J1	< 0.1 U1
12/12/2018	Background	< 0.02 U1	1.75	1,780	< 0.02 U1	< 0.01 U1	0.237	0.511	0.632	0.11	< 0.02 U1	0.042	< 0.05 U1	0.6 J1	0.1 J1	< 0.1 U1
2/12/2019	Detection	0.02 J1	1.63	1,860	< 0.02 U1	< 0.01 U1	0.222	0.486	0.3849	0.11	< 0.02 U1	0.049	< 0.05 U1	0.6 J1	0.08 J1	< 0.1 U1
4/10/2019	Assessment	0.02 J1	2.43	2,000	< 0.02 U1	< 0.01 U1	0.2 J1	0.477	1.643	0.10	< 0.02 U1	0.052	< 0.05 U1	0.5 J1	0.09 J1	< 0.1 U1
5/30/2019	Assessment	< 0.02 U1	2.44	2,100	< 0.02 U1	< 0.01 U1	0.233	0.432	1.05	0.13	< 0.02 U1	0.055	< 0.05 U1	0.5 J1	0.09 J1	< 0.1 U1
10/2/2019	Assessment	< 0.02 U1	2.84	2,380	< 0.02 U1	< 0.01 U1	0.208	0.318	1.399	0.10	< 0.05 U1	0.0767	< 0.2 U1	0.6 J1	0.08 J1	< 0.1 U1
2/11/2020	Assessment	0.03 J1	2.32	2,840	< 0.02 U1	< 0.01 U1	0.2 J1	0.172	2.02	0.12	< 0.05 U1	0.0873	< 0.2 U1	0.5 J1	< 0.03 U1	< 0.1 U1
4/21/2020	Assessment	0.03 J1	2.00	2,570	< 0.02 U1	< 0.01 U1	0.234	0.282	1.013	0.10	< 0.05 U1	0.0661	< 0.2 U1	0.9 J1	0.08 J1	< 0.1 U1
10/7/2020	Assessment	0.06 J1	2.09	2,770	< 0.02 U1	< 0.01 U1	0.08 J1	0.189	0.5813	0.15	< 0.05 U1	0.0716	< 0.2 U1	0.4 J1	0.04 J1	< 0.1 U1
2/9/2021	Assessment	0.08 J1	3.36	3,810	< 0.02 U1	< 0.01 U1	0.1 J1	0.153	1.392	0.12	< 0.05 U1	0.0977	< 0.2 U1	0.4 J1	0.08 J1	< 0.1 U1
4/13/2021	Assessment	0.08 J1	3.94	3,540	< 0.007 U1	< 0.004 U1	0.2 J1	0.118	1.565	0.17	< 0.05 U1	0.103	< 0.2 U1	0.5 J1	< 0.09 U1	< 0.04 U1
10/12/2021	Assessment	0.08 J1	2.81	2,740	< 0.007 U1	< 0.004 U1	0.24	0.206	1.85	0.12	< 0.05 U1	0.0613	< 0.2 U1	0.5	< 0.09 U1	< 0.04 U1
2/23/2022	Assessment	0.09 J1	2.84	3,190	< 0.007 U1	< 0.004 U1	0.12 J1	0.167 B1	1.97	0.11	< 0.05 U1	0.0777	< 0.2 U1	0.4 J1	< 0.09 U1	< 0.04 U1
4/13/2022	Assessment	0.09 J1	2.62	2,750	< 0.007 U1	< 0.004 U1	0.10 J1	0.203	0.68	0.1	< 0.05 U1	0.0617	< 0.2 U1	0.4 J1	0.1 J1	< 0.04 U1
10/5/2022	Assessment	0.05 J1	2.96	2,980	0.007 J1	< 0.004 U1	0.52	0.219	1.83	0.11	< 0.05 U1	0.080	< 0.2 U1	0.4 J1	0.11 J1	< 0.04 U1
2/14/2023	Assessment	0.07 J1	2.74	2,850	0.008 J1	< 0.004 U1	0.21	0.219	1.66	0.10	< 0.05 U1	0.0557	< 0.2 U1	1.9	0.09 J1	< 0.04 U1
4/4/2023	Assessment	0.123	2.34	2,320	0.01 J1	< 0.004 U1	0.18 J1	0.199	1.70	0.09	< 0.05 U1	0.0522	< 0.2 U1	0.3 J1	0.09 J1	< 0.02 U1
10/10/2023	Assessment	0.026 J1	1.77	2,150	0.010 J1	< 0.004 U1	0.22 J1	0.217	2.52	0.1	< 0.05 U1	0.0418	< 0.2 U1	0.2 J1	0.05 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1604
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.428	27.7	29.9	0.27	6.9	8.2	404
12/11/2017	Background	0.476	29.3	22.5	0.22	6.7	6.3	395
2/14/2018	Background	0.396	26.3	22.6	0.23	7.1	6.7	378
4/12/2018	Background	0.399	27.2	22.5	0.27	7.2	5.6	410
6/12/2018	Background	0.406	26.2	21.0	0.25	7.1	4.2	374
8/22/2018	Background	0.471	27.3	20.3	0.26	7.1	4.1	390
10/16/2018	Background	0.444	27.2	17.8	0.22	7.1	3.4	390
12/12/2018	Background	0.468	28.9	19.4	0.22	7.1	2.8	375
2/12/2019	Detection	0.350	28.0	20.4	0.21	7.2	1.7	386
4/10/2019	Assessment	0.384	28.5	21.1	0.21	7.2	1.4	399
5/30/2019	Assessment	0.348	26.0	19.0	0.26	7.3	1.9	384
10/2/2019	Assessment	0.413	30.9	24.3	0.20	7.1	2.4	407
2/11/2020	Assessment	0.404	27.8	21.9	0.24	7.3	1.3	393
4/21/2020	Assessment	0.392	29.3	24.7	0.25	6.5	0.8	401
10/7/2020	Assessment	0.400	27.3	17.4	0.34	7.0	0.5	384
2/9/2021	Assessment	0.462	22.4	15.7	0.37	7.3	0.9	441
4/13/2021	Assessment	0.403	25.8	16.9	0.30	7.3	0.9	396
10/12/2021	Assessment	0.444	22.9	16.6	0.31	7.6	< 0.06 U1	390
2/23/2022	Assessment	0.413	25.6	16.9	0.30	7.6	0.29 J1	420
4/13/2022	Assessment	0.439	26.5	16.2	0.28	6.8	0.13 J1	390
10/5/2022	Assessment	0.452	25.9	17.3	0.30	6.9	< 0.06 U1	410
2/14/2023	Assessment	0.432	28.6	18.5	0.29	7.2	< 0.06 U1	410
4/4/2023	Assessment	0.436	26.1	17.1	0.28	7.3	< 0.1 U1	360
10/10/2023	Assessment	0.379	23.0	17.1	0.30	7.3	< 0.1 U1	410

Table 1. Groundwater Data Summary: MW-1604

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.05	1.64	3,330	< 0.004 U1	< 0.005 U1	0.331	0.585	2.503	0.27	0.060	0.078	< 0.05 U1	1.57	0.04 J1	0.01 J1
12/11/2017	Background	0.04 J1	1.39	3,160	< 0.004 U1	< 0.005 U1	0.113	0.347	0.46499	0.22	0.02 J1	0.090	0.06 J1	0.83	< 0.03 U1	0.01 J1
2/14/2018	Background	0.05 J1	1.61	3,320	< 0.004 U1	< 0.005 U1	0.116	0.487	1.265	0.23	0.01 J1	0.080	< 0.05 U1	0.92	0.05 J1	< 0.01 U1
4/12/2018	Background	0.18	3.10	2,880	0.007 J1	< 0.005 U1	0.255	0.427	1.117	0.27	0.068	0.078	< 0.05 U1	0.50	0.07 J1	< 0.01 U1
6/12/2018	Background	0.08	1.58	3,210	0.005 J1	< 0.005 U1	0.248	0.687	1.762	0.25	0.047	0.087	< 0.05 U1	0.47	0.05 J1	0.01 J1
8/22/2018	Background	0.07	1.71	3,260	< 0.004 U1	< 0.005 U1	0.244	1.03	1.185	0.26	0.01 J1	0.085	< 0.05 U1	0.54	0.05 J1	0.02 J1
10/16/2018	Background	< 0.02 U1	1.89	3,040	< 0.02 U1	< 0.01 U1	0.207	1.12	0.776	0.22	< 0.02 U1	0.080	< 0.05 U1	0.6 J1	0.06 J1	< 0.1 U1
12/12/2018	Background	0.04 J1	1.36	3,150	< 0.02 U1	< 0.01 U1	0.2 J1	0.634	1.019	0.22	0.02 J1	0.077	< 0.05 U1	0.5 J1	0.03 J1	< 0.1 U1
2/12/2019	Detection	< 0.02 U1	1.50	3,010	< 0.02 U1	< 0.01 U1	0.2 J1	0.590	0.6812	0.21	< 0.02 U1	0.076	< 0.05 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
4/10/2019	Assessment	0.03 J1	2.26	3,280	< 0.02 U1	< 0.01 U1	0.1 J1	0.701	1.561	0.21	< 0.02 U1	0.083	< 0.05 U1	0.4 J1	0.05 J1	< 0.1 U1
5/30/2019	Assessment	0.02 J1	2.44	3,280	< 0.02 U1	< 0.01 U1	0.262	0.766	0.653	0.26	< 0.02 U1	0.077	< 0.05 U1	0.4 J1	0.05 J1	< 0.1 U1
10/2/2019	Assessment	< 0.02 U1	2.98	3,320	< 0.02 U1	< 0.01 U1	0.213	0.672	1.521	0.20	< 0.05 U1	0.0887	< 0.2 U1	< 0.4 U1	0.05 J1	< 0.1 U1
2/11/2020	Assessment	0.05 J1	2.40	3,200	< 0.02 U1	< 0.01 U1	0.2 J1	0.574	1.596	0.24	< 0.05 U1	0.0636	< 0.2 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
4/21/2020	Assessment	0.03 J1	2.03	3,470	< 0.02 U1	< 0.01 U1	0.1 J1	0.580	2.091	0.25	< 0.05 U1	0.0759	< 0.2 U1	0.9 J1	0.03 J1	< 0.1 U1
10/7/2020	Assessment	0.42	2.99	2,940	< 0.02 U1	< 0.01 U1	0.286	0.463	0.6107	0.34	< 0.05 U1	0.0661	< 0.2 U1	2 J1	< 0.03 U1	< 0.1 U1
2/9/2021	Assessment	0.12	1.88	3,170	< 0.02 U1	< 0.01 U1	0.05 J1	0.329	1.288	0.37	< 0.05 U1	0.0710	< 0.2 U1	< 0.4 U1	0.07 J1	< 0.1 U1
4/13/2021	Assessment	0.05 J1	1.28	3,000	< 0.007 U1	< 0.004 U1	0.2 J1	0.299	1.096	0.30	< 0.05 U1	0.0713	< 0.2 U1	0.2 J1	< 0.09 U1	< 0.04 U1
10/12/2021	Assessment	0.06 J1	4.58	3,130	< 0.007 U1	< 0.004 U1	0.19 J1	0.210	1.37	0.31	< 0.05 U1	0.0739	< 0.2 U1	0.2 J1	< 0.09 U1	< 0.04 U1
2/23/2022	Assessment	0.12	4.49	3,230	< 0.007 U1	< 0.004 U1	0.13 J1	0.186 B1	1.47	0.30	< 0.05 U1	0.0860	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
4/13/2022	Assessment	0.04 J1	2.82	3,280	< 0.007 U1	< 0.004 U1	0.04 J1	0.190	1.23	0.28	< 0.05 U1	0.0754	< 0.2 U1	0.2 J1	< 0.09 U1	< 0.04 U1
10/5/2022	Assessment	0.03 J1	3.72	3,160	< 0.007 U1	< 0.004 U1	1.71	0.160	1.28	0.30	< 0.05 U1	0.088	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
2/14/2023	Assessment	0.05 J1	3.89	3,480	< 0.007 U1	< 0.004 U1	0.19 J1	0.154	0.78 P3	0.29	< 0.05 U1	0.0701	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
4/4/2023	Assessment	0.023 J1	2.36	2,990	< 0.007 U1	< 0.004 U1	0.16 J1	0.144	2.11	0.28	< 0.05 U1	0.0781	< 0.2 U1	0.2 J1	0.04 J1	< 0.02 U1
10/10/2023	Assessment	0.020 J1	2.98	2,890	< 0.007 U1	< 0.004 U1	0.45	0.099	1.82	0.30	< 0.05 U1	0.0699	< 0.2 U1	0.3 J1	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1605
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.540	44.2	184	0.34	7.4	97.8	808
12/12/2017	Background	0.522	44.0	342	0.32	7.7	91.1	807
2/15/2018	Background	0.589	50.8	180	0.35	7.8	101	793
4/11/2018	Background	0.543	48.1	184	0.40	7.8	105	1,700
6/12/2018	Background	0.569	48.2	184	0.40	7.7	109	842
8/22/2018	Background	0.699	48.9	186	0.41	7.7	104	857
10/16/2018	Background	0.586	47.9	181	0.37	7.8	85.2	838
12/11/2018	Background	0.589	46.9	177	0.37	7.9	70.5	798
2/12/2019	Detection	0.582	45.1	174	0.35	7.9	61.8	808
4/10/2019	Assessment	0.583	42.9	173	0.33	7.9	46.5	777
5/30/2019	Assessment	0.523	39.5	180	0.39	7.9	47.4	772
10/2/2019	Assessment	0.613	47.6	179	0.31	7.8	35.1	768
2/11/2020	Assessment	0.571	38.7	160	0.36	8.0	11.2	699
4/21/2020	Assessment	0.535	42.3	163	0.33	7.0	5.0	678
10/7/2020	Assessment	0.545	43.4	154	0.38	7.6	< 0.06 U1	682
2/9/2021	Assessment	0.549	42.7	159	0.38	7.8	< 0.06 U1	705
4/13/2021	Assessment	0.529	43.0	161	0.30	7.9	< 0.06 U1	653
10/12/2021	Assessment	0.548	41.6	164	0.36	8.0	< 0.06 U1	660
2/23/2022	Assessment	0.552	45.4	157	0.32	8.1	< 0.06 U1	670
4/13/2022	Assessment	0.571	48.2	154	0.31	7.4	< 0.06 U1	640
10/4/2022	Assessment	0.570	46.6	159	0.30	7.6	< 0.06 U1	650
2/14/2023	Assessment	0.558	47.5	156	0.31	7.7	< 0.06 U1	650
4/4/2023	Assessment	0.535	44.1	146	0.28	7.5	< 0.1 U1	630
10/10/2023	Assessment	0.528	42.1	148	0.28	7.7	< 0.1 U1	630

Table 1. Groundwater Data Summary: MW-1605

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.28	5.81	1,670	< 0.004 U1	< 0.005 U1	0.163	0.403	2.122	0.34	0.029	0.191	< 0.05 U1	8.54	0.05 J1	< 0.01 U1
12/12/2017	Background	0.21	7.25	1,570	0.005 J1	< 0.005 U1	0.158	0.354	2.159	0.32	0.026	0.183	< 0.05 U1	7.42	0.08 J1	0.01 J1
2/15/2018	Background	0.10	4.59	1,560	< 0.004 U1	< 0.005 U1	0.136	0.306	1.134	0.35	0.051	0.220	< 0.05 U1	6.62	0.07 J1	0.02 J1
4/11/2018	Background	0.07	4.58	1,250	< 0.004 U1	< 0.005 U1	0.219	0.316	1.240	0.40	0.036	0.196	< 0.05 U1	4.35	0.05 J1	< 0.01 U1
6/12/2018	Background	0.14	4.50	1,290	0.004 J1	< 0.005 U1	0.230	0.357	1.132	0.40	0.085	0.207	< 0.05 U1	4.19	< 0.03 U1	0.01 J1
8/22/2018	Background	0.11	3.35	1,330	0.01 J1	< 0.005 U1	0.291	0.407	0.349	0.41	0.040	0.206	< 0.05 U1	3.38	0.05 J1	0.02 J1
10/16/2018	Background	0.04 J1	3.11	1,130	< 0.02 U1	< 0.01 U1	0.215	0.321	0.641	0.37	< 0.02 U1	0.198	< 0.05 U1	2.78	< 0.03 U1	< 0.1 U1
12/11/2018	Background	0.04 J1	3.83	1,170	< 0.02 U1	< 0.01 U1	0.2 J1	0.309	2.717	0.37	< 0.02 U1	0.199	< 0.05 U1	2.65	< 0.03 U1	< 0.1 U1
2/12/2019	Detection	0.07 J1	5.22	1,110	< 0.02 U1	0.02 J1	0.246	0.264	0.644	0.35	0.05 J1	0.206	< 0.05 U1	2.10	0.04 J1	< 0.1 U1
4/10/2019	Assessment	0.06 J1	4.11	1,100	< 0.02 U1	0.01 J1	0.288	0.200	1.137	0.33	0.05 J1	0.199	< 0.05 U1	2.34	0.05 J1	< 0.1 U1
5/30/2019	Assessment	0.04 J1	3.81	1,050	< 0.02 U1	< 0.01 U1	0.221	0.176	1.360	0.39	< 0.02 U1	0.178	< 0.05 U1	1 J1	< 0.03 U1	< 0.1 U1
10/2/2019	Assessment	0.03 J1	2.75	1,160	< 0.02 U1	< 0.01 U1	0.2 J1	0.125	0.868	0.31	< 0.05 U1	0.204	< 0.2 U1	1 J1	0.07 J1	< 0.1 U1
2/11/2020	Assessment	0.09 J1	3.14	1,390	< 0.02 U1	< 0.01 U1	0.455	0.068	0.6629	0.36	< 0.05 U1	0.174	< 0.2 U1	0.7 J1	< 0.03 U1	< 0.1 U1
4/21/2020	Assessment	0.06 J1	1.95	1,730	< 0.02 U1	< 0.01 U1	0.335	0.115	1.388	0.33	0.06 J1	0.191	< 0.2 U1	2.68	< 0.03 U1	< 0.1 U1
10/7/2020	Assessment	0.03 J1	2.07	1,890	< 0.02 U1	< 0.01 U1	0.300	0.060	6.63	0.38	< 0.05 U1	0.173	< 0.2 U1	0.7 J1	< 0.03 U1	< 0.1 U1
2/9/2021	Assessment	0.03 J1	1.54	2,160	< 0.02 U1	< 0.01 U1	0.06 J1	0.04 J1	1.713	0.38	< 0.05 U1	0.190	< 0.2 U1	0.6 J1	0.05 J1	< 0.1 U1
4/13/2021	Assessment	0.04 J1	1.78	2,150	< 0.007 U1	< 0.004 U1	0.256	0.04 J1	1.163	0.30	< 0.05 U1	0.182	< 0.2 U1	0.6 J1	< 0.09 U1	< 0.04 U1
10/12/2021	Assessment	0.02 J1	1.29	2,390	< 0.007 U1	< 0.004 U1	0.24	0.038	1.65	0.36	0.06 J1	0.191	< 0.2 U1	0.5	< 0.09 U1	< 0.04 U1
2/23/2022	Assessment	< 0.02 U1	0.97	2,400	< 0.007 U1	< 0.004 U1	0.26	0.045 B1	1.35	0.32	< 0.05 U1	0.205	< 0.2 U1	0.8	< 0.09 U1	< 0.04 U1
4/13/2022	Assessment	< 0.02 U1	1.24	2,330	< 0.007 U1	< 0.004 U1	0.06 J1	0.037	1.47	0.31	< 0.05 U1	0.201	< 0.2 U1	0.6	< 0.09 U1	< 0.04 U1
10/4/2022	Assessment	0.03 J1	1.28	2,360	< 0.007 U1	< 0.004 U1	0.13 J1	0.035	3.33	0.30	< 0.05 U1	0.208	< 0.2 U1	0.2 J1	< 0.09 U1	< 0.04 U1
2/14/2023	Assessment	< 0.02 U1	1.00	2,560	< 0.007 U1	< 0.004 U1	0.14 J1	0.046	2.46	0.31	< 0.05 U1	0.177	< 0.2 U1	0.6	< 0.09 U1	< 0.04 U1
4/4/2023	Assessment	0.012 J1	0.74	2,200	< 0.007 U1	< 0.004 U1	0.16 J1	0.039	2.25	0.28	< 0.05 U1	0.189	< 0.2 U1	0.2 J1	< 0.04 U1	< 0.02 U1
10/10/2023	Assessment	0.018 J1	1.02	2,310	< 0.007 U1	< 0.004 U1	0.24 J1	0.038	1.89	0.28	< 0.05 U1	0.201	< 0.2 U1	0.4 J1	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1606
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/18/2017	Background	0.078	50.9	14.3	0.20	6.8	57.9	374
12/12/2017	Background	0.194	55.3	14.4	0.17	7.1	66.8	348
2/14/2018	Background	0.175	56.8	14.9	0.18	7.1	68.3	336
4/10/2018	Background	0.148	44.8	12.9	0.26	7.2	42.4	302
6/11/2018	Background	0.144	55.0	14.0	0.27	7.0	45.4	316
8/21/2018	Background	0.168	64.4	15.7	0.23	7.0	54.9	377
10/15/2018	Background	0.136	60.0	14.3	0.24	7.1	47.8	344
12/11/2018	Background	0.126	58.6	13.9	0.25	7.2	42.1	329
2/12/2019	Detection	0.110	56.8	14.1	0.24	7.2	39.7	341
4/9/2019	Assessment	0.07 J1	62.2	13.0	0.16	7.2	32.5	352
5/29/2019	Assessment	0.05 J1	55.9	11.5	0.16	7.3	27.6	336
10/1/2019	Assessment	0.084	58.9	13.6	0.19	7.0	32.4	350
2/10/2020	Assessment	0.084	54.5	11.8	0.19	7.3	35.4	321
4/20/2020	Assessment	0.04 J1	59.2	7.0	0.12	6.6	25.4	287
10/7/2020	Assessment	0.067	59.3	12.9	0.18	7.1	35.7	321
2/9/2021	Assessment	0.079	57.8	13.0	0.22	7.1	26.5	368
4/12/2021	Assessment	0.083	57.2	13.4	0.22	7.1	26.8	333
10/12/2021	Assessment	0.139	57.7	13.4	0.22	7.3	44.8	330
2/22/2022	Assessment	0.130	57.0	13.6	0.19	7.4	46.4	350
4/13/2022	Assessment	0.137	56.3	12.8	0.19	6.9	44.3	330
10/4/2022	Assessment	0.163	60.4	13.8	0.20	6.9	56.6	360
2/14/2023	Assessment	0.142	58.8	13.2	0.19	7.1	50.7	350
4/4/2023	Assessment	0.136	51.1	12.4	0.20	7.1	45.7	320
10/10/2023	Assessment	0.137	53.1	13.0	0.20	7.1	56.4	340 S7

Table 1. Groundwater Data Summary: MW-1606

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/18/2017	Background	0.02 J1	7.03	117	< 0.004 U1	0.01 J1	0.139	6.00	2.331	0.20	0.628	0.089	< 0.05 U1	84.2	0.06 J1	0.04 J1
12/12/2017	Background	0.02 J1	6.77	117	0.005 J1	0.01 J1	0.216	6.33	0.7252	0.17	0.573	0.086	0.06 J1	82.4	0.1 J1	0.04 J1
2/14/2018	Background	0.03 J1	6.76	116	0.006 J1	< 0.005 U1	0.140	5.66	1.459	0.18	0.388	0.067	< 0.05 U1	65.1	0.1 J1	0.04 J1
4/10/2018	Background	0.02 J1	6.72	104	0.007 J1	0.01 J1	0.225	5.53	1.156	0.26	0.549	0.095	< 0.05 U1	89.6	0.1	0.04 J1
6/11/2018	Background	0.04 J1	6.89	114	0.006 J1	< 0.005 U1	0.205	4.98	1.154	0.27	0.451	0.099	< 0.05 U1	91.5	0.08 J1	0.05
8/21/2018	Background	0.04 J1	7.19	124	0.006 J1	0.006 J1	0.218	6.13	1.269	0.23	0.515	0.081	< 0.05 U1	66.1	0.08 J1	0.05
10/15/2018	Background	0.03 J1	7.13	116	< 0.02 U1	< 0.01 U1	0.211	5.34	1.148	0.24	0.391	0.087	< 0.05 U1	71.9	0.07 J1	< 0.1 U1
12/11/2018	Background	< 0.02 U1	7.71	117	< 0.02 U1	< 0.01 U1	0.2 J1	5.58	2.743	0.25	0.445	0.091	< 0.05 U1	80.7	0.05 J1	< 0.1 U1
2/12/2019	Detection	< 0.02 U1	7.90	117	< 0.02 U1	< 0.01 U1	0.2 J1	5.79	1.189	0.24	0.343	0.100	< 0.05 U1	87.4	0.04 J1	< 0.1 U1
4/9/2019	Assessment	< 0.02 U1	11.0	107	< 0.02 U1	< 0.01 U1	0.1 J1	4.99	1.491	0.16	0.225	0.044	< 0.05 U1	44.8	0.08 J1	< 0.1 U1
5/29/2019	Assessment	< 0.02 U1	11.6	106	< 0.02 U1	< 0.01 U1	0.2 J1	4.86	1.4097	0.16	0.255	0.038	< 0.05 U1	39.1	< 0.03 U1	< 0.1 U1
10/1/2019	Assessment	< 0.02 U1	8.33	120	< 0.02 U1	< 0.01 U1	0.2 J1	4.66	0.962	0.19	0.358	0.0717	< 0.2 U1	57.8	0.05 J1	< 0.1 U1
2/10/2020	Assessment	0.02 J1	8.09	105	< 0.02 U1	0.02 J1	0.380	5.03	2.82	0.19	0.713	0.0645	< 0.2 U1	61.4	0.1 J1	< 0.1 U1
4/20/2020	Assessment	0.03 J1	2.80	83.1	< 0.02 U1	0.02 J1	0.2 J1	2.15	2.82	0.12	0.253	0.0267	< 0.2 U1	29.3	0.2	0.1 J1
10/7/2020	Assessment	0.04 J1	15.0	106	< 0.02 U1	0.02 J1	0.2 J1	3.52	2.816	0.18	0.731	0.0220	< 0.2 U1	34.6	0.1 J1	< 0.1 U1
2/9/2021	Assessment	0.03 J1	10.5	124	< 0.02 U1	0.04 J1	0.572	4.68	1.630	0.22	1.03	0.0561	< 0.2 U1	56.7	0.1 J1	< 0.1 U1
4/12/2021	Assessment	< 0.02 U1	8.32	113	0.01 J1	0.02 J1	0.234	4.13	1.507	0.22	0.538	0.0558	< 0.2 U1	53.5	< 0.09 U1	< 0.04 U1
10/12/2021	Assessment	0.02 J1	8.37	127 M1	0.019 J1	0.032	0.48	4.19	6.15	0.22	0.98	0.0979 M1, P3	< 0.2 U1	69.4	0.13 J1	< 0.04 U1
2/22/2022	Assessment	< 0.02 U1	7.01	108	0.009 J1	0.018 J1	0.16 J1	3.64	2.07	0.19	0.44	0.0822	< 0.2 U1	58.2	< 0.09 U1	< 0.04 U1
4/13/2022	Assessment	< 0.02 U1	7.19	111	0.008 J1	0.009 J1	0.15 J1	3.90	1.62	0.19	0.52	0.0915	< 0.2 U1	67.7	0.1 J1	< 0.04 U1
10/4/2022	Assessment	< 0.02 U1	7.25	112	< 0.007 U1	0.007 J1	0.32	4.47	2.43	0.20	0.53	0.091	< 0.2 U1	60.3	< 0.09 U1	< 0.04 U1
2/14/2023	Assessment	0.02 J1	8.06	113	0.011 J1	0.026	0.25	4.65	2.55	0.19	0.86	0.0703	< 0.2 U1	55.0	< 0.09 U1	0.04 J1
4/4/2023	Assessment	< 0.008 U1	6.87	102	< 0.04 U1	< 0.004 U1	0.24 J1	3.55	2.38	0.20	0.32	0.10	< 0.2 U1	62.1	0.06 J1	0.02 J1
10/10/2023	Assessment	0.010 J1	5.10	90.6	< 0.007 U1	0.007 J1	0.17 J1	5.39	1.38	0.20	0.51	0.0840	< 0.2 U1	45.3	0.06 J1	0.04 J1

**Table 1. Groundwater Data Summary: MW-1607
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/18/2017	Background	0.139	54.9	16.7	0.25	7.6	197	468
12/12/2017	Background	0.212	50.1	16.3	0.22	7.4	206	417
2/14/2018	Background	0.121	48.7	10.7	0.20	7.9	149	284
4/11/2018	Background	0.143	49.1	11.0	0.22	8.0	153	306
6/11/2018	Background	0.143	49.5	11.1	0.23	7.8	156	278
8/21/2018	Background	0.151	46.4	12.0	0.26	8.0	162	315
10/15/2018	Background	0.122	45.8	11.7	0.26	8.1	159	302
12/11/2018	Background	0.111	44.8	10.0	0.25	7.7	150	280
2/12/2019	Detection	0.1 J1	46.3	9.5	0.23	7.9	151	298
4/9/2019	Assessment	0.134	47.2	8.2	0.20	8.0	130	296
5/29/2019	Assessment	0.1 J1	44.5	8.4	0.23	7.9	146	293
10/2/2019	Assessment	0.112	49.4	8.5	0.18	7.8	147	290
2/11/2020	Assessment	0.106	47.3	6.6	0.21	8.1	124	279
4/21/2020	Assessment	0.108	48.5	6.7	0.19	7.0	125	275
10/6/2020	Assessment	0.111	42.7	7.4	0.24	7.7	136	270
2/9/2021	Assessment	0.113	41.5	7.0	0.26	7.5	128	303
4/13/2021	Assessment	0.099	43.9	6.3	0.23	7.9	120	275
10/11/2021	Assessment	0.108	44.1	6.74	0.24	8.0	128	260
2/23/2022	Assessment	0.109	43.6 M1, P3	6.82	0.20	8.2	137	270
4/12/2022	Assessment	0.113	44.7	6.20	0.20	7.4	134	280
10/4/2022	Assessment	0.123	43.9 M1, P3	6.76	0.20	7.7	139	280
2/14/2023	Assessment	0.122	42.7	6.97	0.22	7.8	140	290
4/4/2023	Assessment	0.114	42.0 M1	6.14	0.20	8.0	135	260
10/10/2023	Assessment	0.128	42.8 M1	6.99	0.25	7.6	128	300

Table 1. Groundwater Data Summary: MW-1607

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/18/2017	Background	0.05	4.38	141	< 0.004 U1	0.02 J1	0.273	4.06	2.733	0.25	0.228	0.110	< 0.05 U1	89.7	0.09 J1	< 0.01 U1
12/12/2017	Background	0.08	5.28	92.5	0.005 J1	0.12	0.194	8.94	1.062	0.22	0.614	0.119	0.08 J1	126	0.09 J1	0.01 J1
2/14/2018	Background	0.05 J1	0.96	71.5	< 0.004 U1	0.18	0.100	11.2	0.743	0.20	0.727	0.110	< 0.05 U1	160	0.1	0.01 J1
4/11/2018	Background	0.04 J1	1.05	71.1	< 0.004 U1	0.17	0.206	11.4	0.436	0.22	0.585	0.125	< 0.05 U1	144	0.1	0.03 J1
6/11/2018	Background	0.05	0.98	74.7	< 0.004 U1	0.09	0.208	11.3	0.975	0.23	0.524	0.133	< 0.05 U1	153	0.2	0.05 J1
8/21/2018	Background	0.06	1.29	75.7	< 0.004 U1	0.11	0.216	10.1	0.511	0.26	0.525	0.129	< 0.05 U1	165	0.2	0.03 J1
10/15/2018	Background	0.09 J1	1.46	71.9	< 0.02 U1	0.11	0.224	10.9	0.999	0.26	0.524	0.132	< 0.05 U1	164	0.04 J1	< 0.1 U1
12/11/2018	Background	0.03 J1	1.01	70.4	< 0.02 U1	0.25	0.2 J1	12.1	0.660	0.25	0.701	0.126	< 0.05 U1	168	0.1 J1	< 0.1 U1
2/12/2019	Detection	0.04 J1	0.86	73.1	< 0.02 U1	0.18	0.2 J1	12.7	0.885	0.23	0.586	0.139	< 0.05 U1	175	0.2 J1	< 0.1 U1
4/9/2019	Assessment	0.03 J1	1.59	75.3	< 0.02 U1	0.11	0.2 J1	8.87	0.701	0.20	0.423	0.127	< 0.05 U1	138	0.2 J1	< 0.1 U1
5/29/2019	Assessment	0.03 J1	1.08	74.2	< 0.02 U1	0.18	0.212	10.2	0.744	0.23	0.366	0.123	< 0.05 U1	154	0.2 J1	< 0.1 U1
10/2/2019	Assessment	< 0.02 U1	1.64	72.4	< 0.02 U1	0.18	0.2 J1	6.74	1.028	0.18	0.228	0.132	< 0.2 U1	148	0.1 J1	< 0.1 U1
2/11/2020	Assessment	0.03 J1	0.83	69.8	< 0.02 U1	0.17	0.1 J1	9.61	1.659	0.21	0.684	0.112	< 0.2 U1	131	0.4	< 0.1 U1
4/21/2020	Assessment	0.04 J1	0.96	72.4	< 0.02 U1	0.17	0.209	10.1	0.978	0.19	0.667	0.120	< 0.2 U1	134	0.7	0.1 J1
10/6/2020	Assessment	0.08 J1	1.27	68.2	< 0.02 U1	0.10	0.05 J1	7.82	0.315	0.24	0.323	0.125	< 0.2 U1	134	0.2	< 0.1 U1
2/9/2021	Assessment	0.04 J1	1.13	68.5	< 0.02 U1	0.07	0.842	8.45	1.624	0.26	0.394	0.126	< 0.2 U1	141	0.1 J1	< 0.1 U1
4/13/2021	Assessment	0.04 J1	1.00	62.0	< 0.007 U1	0.15	0.2 J1	8.87	0.807	0.23	0.626	0.112	< 0.2 U1	128	0.3 J1	0.05 J1
10/11/2021	Assessment	0.03 J1	1.42	66.8	< 0.007 U1	0.064	< 0.04 U1	6.25	1.63	0.24	0.22	0.108 M1	< 0.2 U1	122	0.12 J1	< 0.04 U1
2/23/2022	Assessment	0.02 J1	1.11	64.3	< 0.007 U1	0.113	0.07 J1	10.6 B1	1.01	0.20	0.53	0.134	< 0.2 U1	137 M1	< 0.09 U1	< 0.04 U1
4/12/2022	Assessment	0.03 J1	1.16	65.0	< 0.007 U1	0.098	< 0.04 U1	9.76	1.40	0.20	0.50	0.128	< 0.2 U1	129	0.19 J1	< 0.04 U1
10/4/2022	Assessment	0.02 J1	1.50	67.9	< 0.007 U1	0.058	0.29	9.31	1.12	0.20	0.37	0.133	< 0.2 U1	132	< 0.09 U1	< 0.04 U1
2/14/2023	Assessment	0.03 J1	1.56	70.2	< 0.007 U1	0.054	0.29	8.54	2.02	0.22	0.33	0.123	< 0.2 U1	135	< 0.09 U1	< 0.04 U1
4/4/2023	Assessment	0.021 J1	1.32	63.2	< 0.007 U1	0.078	0.16 J1	10.2	1.81	0.20	0.53	0.130	< 0.2 U1	131 M1	0.06 J1	< 0.02 U1
10/10/2023	Assessment	0.030 J1	1.21	67.8 M1	< 0.007 U1	0.051	0.19 J1	7.39 M1	1.66	0.25	0.17 J1	0.144 M1	< 0.2 U1	127 M1	0.13 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1608
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.359	1.92	7.6	0.45	8.1	179	484
12/11/2017	Background	0.375	1.31	7.3	0.40	8.0	176	468
2/13/2018	Background	0.349	1.09	8.7	0.45	8.7	182	466
4/10/2018	Background	0.334	0.779	8.0	0.48	8.8	178	466
6/7/2018	Background	0.389	0.708	7.2	0.44	8.7	171	437
8/20/2018	Background	0.315	1.31	7.4	0.43	8.7	173	441
10/17/2018	Background	0.344	1.37	6.8	0.43	0.1	167	439
12/6/2018	Background	0.365	1.24	6.1	0.42	8.7	166	423
2/7/2019	Detection	0.332	1.35	6.2	0.42	8.6	171	445
4/8/2019	Assessment	0.352	1.32	6.7	0.39	8.7	162	454
5/28/2019	Assessment	0.310	1.11	5.4	0.44	8.7	174	443
10/1/2019	Assessment	0.351	1.19	6.6	0.39	8.7	176	457
2/10/2020	Assessment	0.353	0.748	5.2	0.41	9.2	164	422
4/20/2020	Assessment	0.344	0.959	4.6	0.42	8.2	167	418
10/6/2020	Assessment	0.360	1.01	6.6	0.40	8.5	182	445
2/8/2021	Assessment	0.347	0.968	5.8	0.46	8.3	167	442
4/12/2021	Assessment	0.343	0.744	5.8	0.45	8.6	166	434
10/11/2021	Assessment	0.332	0.8	5.68	0.42	8.5	163	420
2/22/2022	Assessment	0.351	0.78	5.89	0.43	8.6	172	440
4/12/2022	Assessment	0.361	0.59	4.37	0.40	8.1	159	410
10/3/2022	Assessment	0.392	0.65	5.24	0.40	7.5	165	450
2/13/2023	Assessment	0.363	0.57	6.38	0.43	8.2	173	450
4/3/2023	Assessment	0.346	0.45	4.04	0.42	7.4	149	400
10/9/2023	Assessment	0.354	0.42	5.09	0.42	8.1	161	430

Table 1. Groundwater Data Summary: MW-1608

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.06	1.69	42.7	0.042	< 0.005 U1	0.956	0.442	0.661	0.45	0.405	0.027	< 0.05 U1	9.04	0.1	0.02 J1
12/11/2017	Background	0.06	1.96	42.9	0.066	< 0.005 U1	1.26	0.425	0.498	0.40	0.526	0.032	0.07 J1	7.35	0.1	0.02 J1
2/13/2018	Background	0.05 J1	2.00	43.8	0.062	< 0.005 U1	1.08	0.401	0.939	0.45	0.656	0.024	< 0.05 U1	6.43	0.09 J1	0.03 J1
4/10/2018	Background	0.05 J1	1.86	41.9	0.056	< 0.005 U1	1.11	0.372	0.484	0.48	0.675	0.023	< 0.05 U1	3.52	0.1	0.02 J1
6/7/2018	Background	0.06	2.99	44.3	0.041	0.006 J1	0.912	0.330	0.894	0.44	0.721	0.028	< 0.05 U1	2.49	0.09 J1	0.02 J1
8/20/2018	Background	0.06	1.88	38.4	0.031	0.02 J1	0.938	0.284	2.988	0.43	0.438	0.018	< 0.05 U1	3.20	0.07 J1	0.02 J1
10/17/2018	Background	0.03 J1	1.70	34.2	0.03 J1	< 0.01 U1	0.647	0.217	3.565	0.43	0.273	0.02 J1	< 0.05 U1	2.89	0.06 J1	< 0.1 U1
12/6/2018	Background	0.04 J1	1.36	33.1	0.03 J1	< 0.01 U1	0.639	0.229	0.518	0.42	0.284	0.01 J1	< 0.05 U1	2.67	0.04 J1	< 0.1 U1
2/7/2019	Detection	0.04 J1	1.64	35.3	0.02 J1	< 0.01 U1	0.633	0.233	0.1256	0.42	0.256	0.03 J1	< 0.05 U1	2.66	0.07 J1	< 0.1 U1
4/8/2019	Assessment	0.03 J1	1.46	32.9	< 0.02 U1	< 0.01 U1	0.696	0.227	0.4948	0.39	0.255	0.02 J1	< 0.05 U1	2.32	0.06 J1	< 0.1 U1
5/28/2019	Assessment	0.08 J1	1.35	34.4	0.03 J1	0.02 J1	0.722	0.262	0.163	0.44	0.418	< 0.009 U1	0.1 J1	2.11	< 0.03 U1	< 0.1 U1
10/1/2019	Assessment	0.03 J1	1.46	35.0	< 0.02 U1	< 0.01 U1	0.359	0.159	0.462	0.39	0.214	0.0211	< 0.2 U1	2 J1	0.04 J1	< 0.1 U1
2/10/2020	Assessment	0.03 J1	1.22	29.8	< 0.02 U1	< 0.01 U1	0.618	0.280	0.594	0.41	0.250	0.0197	< 0.2 U1	2 J1	0.04 J1	< 0.1 U1
4/20/2020	Assessment	0.02 J1	0.89	28.9	< 0.02 U1	< 0.01 U1	0.413	0.203	1.497	0.42	0.2 J1	0.0185	< 0.2 U1	1 J1	0.05 J1	< 0.1 U1
10/6/2020	Assessment	0.02 J1	1.25	32.0	< 0.02 U1	< 0.01 U1	0.302	0.200	0.790	0.40	0.1 J1	0.0196	< 0.2 U1	2 J1	0.03 J1	< 0.1 U1
2/8/2021	Assessment	< 0.02 U1	1.15	30.3	< 0.02 U1	< 0.01 U1	0.408	0.175	0.715	0.46	0.1 J1	0.0194	< 0.2 U1	1 J1	0.07 J1	< 0.1 U1
4/12/2021	Assessment	0.02 J1	1.06	28.1	0.008 J1	< 0.004 U1	0.207	0.120	0.646	0.45	0.1 J1	0.0183	< 0.2 U1	1 J1	< 0.09 U1	< 0.04 U1
10/11/2021	Assessment	0.03 J1	0.98	27.7	< 0.007 U1	< 0.004 U1	0.23	0.122	0.68	0.42	0.10 J1	0.0189	< 0.2 U1	1.0	< 0.09 U1	< 0.04 U1
2/22/2022	Assessment	< 0.02 U1	0.97	26.5	< 0.007 U1	< 0.004 U1	0.20	0.109	1.09	0.43	0.07 J1	0.0193	< 0.2 U1	1.2	< 0.09 U1	< 0.04 U1
4/12/2022	Assessment	0.02 J1	0.73	24.8	0.008 J1	< 0.004 U1	0.20	0.126	0.70	0.40	0.11 J1	0.0192	< 0.2 U1	1.0	< 0.09 U1	< 0.04 U1
10/3/2022	Assessment	0.02 J1	1.21	27.0	< 0.007 U1	0.004 J1	0.18 J1	0.144	1.73	0.40	0.11 J1	0.0188	< 0.2 U1	1	< 0.09 U1	< 0.04 U1
2/13/2023	Assessment	< 0.02 U1	1.23	26.4	< 0.007 U1	0.005 J1	0.27	0.117	2.05	0.43	0.09 J1	0.0169	< 0.2 U1	0.8	< 0.09 U1	< 0.04 U1
4/3/2023	Assessment	0.018 J1	0.77	21.6	< 0.007 U1	0.008 J1	0.80	0.093	1.31	0.42	0.09 J1	0.0179	< 0.2 U1	0.7	< 0.04 U1	< 0.02 U1
10/9/2023	Assessment	0.197	1.02	23.5	< 0.007 U1	0.007 J1	0.24 J1	0.092	0.58 L1, P2	0.42	0.06 J1	0.0188	< 0.2 U1	0.6	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1609
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/18/2017	Background	0.017	66.6	4.1	0.32	6.7	13.6	358
12/11/2017	Background	0.084	67.9	3.1	0.32	6.6	12.6	326
2/13/2018	Background	0.084	60.7	3.2	0.31	7.6	21.8	262
4/10/2018	Background	0.041	59.9	1.7	0.27	7.4	15.8	292
6/11/2018	Background	0.077	75.5	1.9	0.28	7.3	21.0	312
8/21/2018	Background	0.117	72.6	1.5	0.29	7.3	13.7	311
10/15/2018	Background	0.05 J1	70.0	1.6	0.27	7.5	16.8	276
12/6/2018	Background	0.04 J1	66.1	1.5	0.26	7.5	14.9	281
2/7/2019	Detection	< 0.02 U1	72.3	1.3	0.21	7.4	13.7	305
4/8/2019	Assessment	< 0.02 U1	82.5	1.2	0.20	7.5	13.6	323
5/28/2019	Assessment	< 0.02 U1	74.8	1.3	0.25	7.6	17.4	322
10/1/2019	Assessment	< 0.02 U1	69.0	1.3	0.25	7.4	13.2	282
2/10/2020	Assessment	< 0.02 U1	65.6	1.1	0.22	7.8	12.9	287
4/20/2020	Assessment	< 0.02 U1	66.0	1.1	0.21	7.0	12.4	276
10/6/2020	Assessment	< 0.02 U1	70.1	1.4	0.23	7.3	17.3	271
2/8/2021	Assessment	< 0.02 U1	66.4	1.5	0.26	7.4	19.6	284
4/12/2021	Assessment	< 0.009 U1	66.2	1.0	0.24	7.5	11.7	282
10/11/2021	Assessment	< 0.009 U1	71.1	1.40	0.24	7.7	17.0	260
2/22/2022	Assessment	< 0.009 U1	65.3	1.36	0.24	7.8	18.4	290
4/12/2022	Assessment	0.010 J1	72.7	0.97	0.23	7.1	16.9	290
10/3/2022	Assessment	0.014 J1	79.0	1.13	0.24	7.0	11.8	270
2/13/2023	Assessment	0.013 J1	79.1	1.25	0.26	7.4	15.0	260
4/3/2023	Assessment	0.01 J1	74.5	0.90	0.23	6.8	14.7	300
10/9/2023	Assessment	0.012 J1	61.2	1.11	0.26	7.5	14.7	260

Table 1. Groundwater Data Summary: MW-1609

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/18/2017	Background	0.06	0.97	476	< 0.004 U1	< 0.005 U1	0.126	0.338	3.258	0.32	0.142	< 0.0002 U1	< 0.05 U1	2.22	0.03 J1	< 0.01 U1
12/11/2017	Background	0.05	0.95	507	0.004 J1	< 0.005 U1	0.112	0.258	1.423	0.32	0.033	0.010	< 0.05 U1	1.78	< 0.03 U1	0.03 J1
2/13/2018	Background	0.05 J1	0.43	333	< 0.004 U1	< 0.005 U1	0.151	0.522	1.661	0.31	0.326	< 0.0002 U1	< 0.05 U1	1.55	0.1 J1	0.03 J1
4/10/2018	Background	0.03 J1	0.18	359	< 0.004 U1	0.02 J1	0.164	0.168	1.544	0.27	0.426	0.0009 J1	< 0.05 U1	1.34	0.2	0.01 J1
6/11/2018	Background	0.07	0.19	397	< 0.004 U1	0.04	0.154	0.082	1.893	0.28	0.524	0.005	< 0.05 U1	0.79	0.1	0.01 J1
8/21/2018	Background	0.13	0.28	435	< 0.004 U1	0.03	0.232	1.38	1.161	0.29	0.548	0.004	< 0.05 U1	0.46	0.03 J1	0.09
10/15/2018	Background	0.05 J1	0.19	345	< 0.02 U1	< 0.01 U1	0.319	0.558	0.8423	0.27	0.506	< 0.009 U1	< 0.05 U1	0.6 J1	< 0.03 U1	< 0.1 U1
12/6/2018	Background	0.02 J1	0.14	356	< 0.02 U1	0.01 J1	0.2 J1	0.114	1.794	0.26	0.350	0.01 J1	< 0.05 U1	0.6 J1	0.1 J1	< 0.1 U1
2/7/2019	Detection	0.03 J1	0.10	365	< 0.02 U1	0.02 J1	0.239	< 0.02 U1	1.569	0.21	0.362	< 0.009 U1	< 0.05 U1	0.4 J1	0.2 J1	< 0.1 U1
4/8/2019	Assessment	0.03 J1	0.10	443	< 0.02 U1	0.01 J1	0.1 J1	0.206	1.519	0.20	0.528	< 0.009 U1	< 0.05 U1	< 0.4 U1	0.06 J1	< 0.1 U1
5/28/2019	Assessment	0.02 J1	0.10	466	< 0.02 U1	0.01 J1	0.234	< 0.02 U1	1.387	0.25	0.337	< 0.009 U1	0.1 J1	< 0.4 U1	0.7	< 0.1 U1
10/1/2019	Assessment	0.02 J1	0.19	412	< 0.02 U1	0.02 J1	0.1 J1	0.634	2.24	0.25	0.935	0.00107	< 0.2 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
2/10/2020	Assessment	< 0.02 U1	0.13	355	< 0.02 U1	0.01 J1	0.1 J1	0.226	2.79	0.22	1.25	0.000755	< 0.2 U1	0.6 J1	0.1 J1	< 0.1 U1
4/20/2020	Assessment	< 0.02 U1	0.08 J1	337	< 0.02 U1	0.01 J1	0.2 J1	< 0.02 U1	5.26	0.21	0.323	0.000559	< 0.2 U1	< 0.4 U1	0.2	< 0.1 U1
10/6/2020	Assessment	0.03 J1	0.1 J1	424	< 0.02 U1	0.01 J1	0.203	0.212	1.938	0.23	0.324	0.000975	< 0.2 U1	1 J1	0.03 J1	< 0.1 U1
2/8/2021	Assessment	0.03 J1	0.1 J1	399	< 0.02 U1	0.01 J1	0.233	0.207	1.224	0.26	0.298	0.00101	< 0.2 U1	< 0.4 U1	0.1 J1	< 0.1 U1
4/12/2021	Assessment	0.02 J1	0.08 J1	340	< 0.007 U1	0.01 J1	0.08 J1	0.005 J1	4.39	0.24	0.242	0.000654	< 0.2 U1	0.3 J1	0.2 J1	< 0.04 U1
10/11/2021	Assessment	0.04 J1	0.09 J1	387	< 0.007 U1	0.015 J1	0.07 J1	0.241	1.3	0.24	0.57	0.00095	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
2/22/2022	Assessment	0.02 J1	0.08 J1	366	< 0.007 U1	0.011 J1	0.07 J1	0.022	2.14	0.24	0.15 J1	0.00093	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
4/12/2022	Assessment	0.02 J1	0.06 J1	410	< 0.007 U1	0.011 J1	< 0.04 U1	0.005 J1	1.36	0.23	0.19 J1	0.00097	< 0.2 U1	0.3 J1	0.17 J1	< 0.04 U1
10/3/2022	Assessment	0.02 J1	0.14	385	< 0.007 U1	0.007 J1	< 0.04 U1	0.433	3.34	0.24	0.23	0.00092	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
2/13/2023	Assessment	< 0.02 U1	0.10	423	< 0.007 U1	0.009 J1	0.19 J1	0.220	2.33	0.26	0.23	0.00085	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
4/3/2023	Assessment	0.017 J1	0.05 J1	388	< 0.007 U1	0.012 J1	0.22 J1	0.014 J1	2.39	0.23	0.21	0.0009	< 0.2 U1	0.3 J1	0.32 J1	< 0.02 U1
10/9/2023	Assessment	0.018 J1	0.12	364	< 0.007 U1	0.008 J1	0.22 J1	0.178	1.51 L1, P2	0.26	0.20	0.00100	< 0.2 U1	0.3 J1	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1610
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/17/2017	Background	0.097	35.5	11.9	0.18	7.3	47.7	260
12/12/2017	Background	0.092	35.0	11.1	0.17	7.1	46.2	241
2/15/2018	Background	0.105	37.3	11.8	0.20	7.5	49.1	247
4/11/2018	Background	0.060	36.1	11.7	0.21	7.6	46.4	254
6/12/2018	Background	0.053	35.8	13.4	0.21	7.5	53.2	258
8/21/2018	Background	0.139	35.2	11.7	0.22	7.6	48.7	258
10/16/2018	Background	0.07 J1	35.0	10.4	0.21	7.7	41.1	245
12/11/2018	Background	0.05 J1	33.6	10.5	0.22	7.7	43.3	233
2/12/2019	Detection	0.03 J1	35.4	10.8	0.21	7.7	41.2	257
4/9/2019	Assessment	0.05 J1	38.5	10.9	0.17	7.7	41.6	263
5/29/2019	Assessment	0.04 J1	35.6	10.5	0.18	7.8	44.1	263
10/1/2019	Assessment	0.04 J1	37.8	10.7	0.18	7.5	40.8	258
2/11/2020	Assessment	0.03 J1	36.8	10.5	0.19	7.8	36.4	245
4/20/2020	Assessment	0.04 J1	39.2	10.6	0.20	6.9	37.7	254
10/7/2020	Assessment	0.068	14.2	10.1	0.35	8.3	47.1	229
2/9/2021	Assessment	0.04 J1	31.2	10.0	0.26	7.7	38.7	251
4/12/2021	Assessment	0.04 J1	29.5	10.3	0.26	7.6	34.2	235
10/12/2021	Assessment	0.035 J1	30.9	9.84	0.20	8.0	14.5	210
2/23/2022	Assessment	0.028 J1	33.6	9.99	0.19	8.0	13.4	230
4/13/2022	Assessment	0.030 J1	36.2	9.37	0.18	7.2	14.7	230
10/4/2022	Assessment	0.032 J1	35.2	9.84	0.19	7.0	17.7	230
2/13/2023	Assessment	0.028 J1	34.4	9.58	0.19	7.5	15.9	230
4/3/2023	Assessment	0.026 J1	33.5	9.34	0.20	7.3	13.8	220
10/9/2023	Assessment	0.029 J1	32.9	9.69	0.19	7.5	20.1	220

Table 1. Groundwater Data Summary: MW-1610

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/17/2017	Background	0.22	1.67	212	< 0.004 U1	0.03	0.167	9.90	0.839	0.18	12.6	0.141	< 0.05 U1	139	0.4	0.03 J1
12/12/2017	Background	0.07	1.18	227	0.004 J1	0.01 J1	0.174	12.1	1.132	0.17	15.2	0.146	0.06 J1	152	0.3	0.01 J1
2/15/2018	Background	0.05 J1	1.56	203	0.007 J1	< 0.005 U1	0.159	11.7	0.688	0.20	11.1	0.180	< 0.05 U1	161	0.2	0.02 J1
4/11/2018	Background	0.09	1.37	193	0.004 J1	0.03	0.192	10.2	0.192	0.21	15.0	0.171	< 0.05 U1	135	0.4	0.02 J1
6/12/2018	Background	0.08	1.24	202	0.004 J1	< 0.005 U1	0.210	10.6	1.788	0.21	8.48	0.188	< 0.05 U1	132	0.3	0.02 J1
8/21/2018	Background	0.06	1.08	200	< 0.004 U1	< 0.005 U1	0.248	10.1	1.039	0.22	3.61	0.206	< 0.05 U1	172	0.1	0.02 J1
10/16/2018	Background	< 0.02 U1	1.28	203	< 0.02 U1	< 0.01 U1	0.262	8.25	0.938	0.21	4.33	0.207	< 0.05 U1	160	0.1 J1	< 0.1 U1
12/11/2018	Background	0.03 J1	1.69	200	< 0.02 U1	< 0.01 U1	0.208	8.97	1.759	0.22	7.18	0.219	< 0.05 U1	182	0.2	< 0.1 U1
2/12/2019	Detection	0.08 J1	1.59	253	< 0.02 U1	0.02 J1	0.2 J1	7.43	0.517	0.21	6.94	0.183	< 0.05 U1	159	0.5	< 0.1 U1
4/9/2019	Assessment	0.12	1.61	247	< 0.02 U1	0.03 J1	0.267	6.28	1.338	0.17	9.60	0.197	< 0.05 U1	156	0.5	< 0.1 U1
5/29/2019	Assessment	0.07 J1	1.29	241	< 0.02 U1	0.04 J1	0.243	7.92	0.331	0.18	6.54	0.191	< 0.05 U1	167	0.3	< 0.1 U1
10/1/2019	Assessment	0.02 J1	1.28	235	< 0.02 U1	< 0.01 U1	0.2 J1	6.35	0.883	0.18	3.28	0.192	< 0.2 U1	135	0.3	< 0.1 U1
2/11/2020	Assessment	0.35	1.00	272	< 0.02 U1	0.03 J1	0.209	6.77	1.182	0.19	4.96	0.173	< 0.2 U1	144	0.3	< 0.1 U1
4/20/2020	Assessment	1.46	1.39	261	< 0.02 U1	0.06	0.800	7.43	1.835	0.20	4.04	0.180	< 0.2 U1	143	0.3	< 0.1 U1
10/7/2020	Assessment	0.69	5.92	151	< 0.02 U1	< 0.01 U1	0.278	4.30	1.734	0.35	1.47	0.348	< 0.2 U1	345	0.3	< 0.1 U1
2/9/2021	Assessment	0.06 J1	1.67	311	< 0.02 U1	0.02 J1	0.248	5.31	0.944	0.26	0.551	0.215	< 0.2 U1	183	0.07 J1	< 0.1 U1
4/12/2021	Assessment	1.44	2.26	251	< 0.007 U1	0.01 J1	0.204	5.26	0.725	0.26	3.09	0.219	< 0.2 U1	185	0.5 J1	< 0.04 U1
10/12/2021	Assessment	0.08 J1	1.41	285	< 0.007 U1	0.007 J1	0.49	4.97	0.48	0.20	0.94	0.150	< 0.2 U1	83.0	0.13 J1	< 0.04 U1
2/23/2022	Assessment	0.06 J1	1.14	303	< 0.007 U1	0.008 J1	0.14 J1	5.94 B1	1.49	0.19	1.11	0.146	< 0.2 U1	75.8	< 0.09 U1	< 0.04 U1
4/13/2022	Assessment	0.46	1.67	345	< 0.007 U1	0.006 J1	0.12 J1	4.81	0.83	0.18	1.65	0.132	< 0.2 U1	85.6	0.22 J1	< 0.04 U1
10/4/2022	Assessment	0.21	1.07	299	< 0.007 U1	0.031	0.20	5.87	1.80	0.19	1.17	0.171	< 0.2 U1	110	0.14 J1	< 0.04 U1
2/13/2023	Assessment	0.06 J1	0.95	292	< 0.007 U1	< 0.004 U1	0.18 J1	7.60	1.71	0.19	2.53	0.143	< 0.2 U1	107	< 0.09 U1	< 0.04 U1
4/3/2023	Assessment	0.210	1.26	275	< 0.007 U1	0.009 J1	0.19 J1	6.21	2.92	0.20	1.29	0.144	< 0.2 U1	94.5	0.09 J1	< 0.02 U1
10/9/2023	Assessment	0.057 J1	0.71	268	< 0.007 U1	0.009 J1	0.26 J1	5.08	1.29 L1, P2	0.19	1.19	0.176	< 0.2 U1	98.8	0.05 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1611
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/19/2017	Background	0.423	115	131	0.48	7.4	1,600	2,940
12/11/2017	Background	0.551	124	138	0.68	7.5	1,690	3,420
2/13/2018	Background	0.663	143	101	0.66	7.7	1,330	2,720
4/10/2018	Background	0.669	96.2	91.3	0.85	7.8	1,400	2,520
6/11/2018	Background	0.701	68.6	61.5	0.90	7.7	777	1,750
8/21/2018	Background	0.650	46.7	48.9	0.98	7.7	552	1,450
10/15/2018	Background	0.634	42.5	38.5	0.92	7.8	389	1,200
12/6/2018	Background	0.681	36.3	36.2	0.96	7.9	318	1,060
2/12/2019	Detection	0.559	31.9	31.3	0.98	7.8	259	989
4/9/2019	Assessment	0.622	32.8	26.9	0.92	7.9	222	939
5/29/2019	Assessment	0.536	27.7	24.2	0.99	8.0	201	852
10/1/2019	Assessment	0.617	28.2	21.7	1.06	7.8	166	771
2/11/2020	Assessment	0.586	25.8	17.9	1.00	8.0	139	697
4/20/2020	Assessment	0.569	26.0	17.0	1.07	7.1	125	662
10/6/2020	Assessment	0.556	24.0	16.0	1.02	7.7	98.1	622
2/8/2021	Assessment	0.558	22.6	14.7	1.15	7.7	82.9	619
4/12/2021	Assessment	0.546	22.7	14.8	1.18	7.9	71.8	580
10/11/2021	Assessment	0.549	22.6	13.5	0.91	8.1	48.3	540
2/22/2022	Assessment	0.535	18.8	13.7	1.15	8.2	45.1	540
4/12/2022	Assessment	0.546	20.6	13.3	1.11	7.5	42.9	540
10/3/2022	Assessment	0.552	33.8	12.9	1.13	7.4	33.3	520
2/13/2023	Assessment	0.523	24.2	12.5	1.17	7.7	27.4	500
4/3/2023	Assessment	0.511	24.6	12.0	1.15	7.1	24.3	510
10/9/2023	Assessment	0.492	16.7	11.3	1.13	7.8	19.3	470

Table 1. Groundwater Data Summary: MW-1611

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/19/2017	Background	0.33	7.16	91.8	< 0.004 U1	0.01 J1	0.656	0.311	1.295	0.48	1.05	0.109	< 0.05 U1	38.0	0.09 J1	< 0.01 U1
12/11/2017	Background	0.18	11.5	63.7	0.01 J1	< 0.01 U1	0.555	0.080	0.278	0.68	0.04 J1	0.130	0.08 J1	6.76	0.1 J1	0.04 J1
2/13/2018	Background	0.54	36.5	53.3	0.01 J1	< 0.005 U1	0.836	0.131	0.748	0.66	0.146	0.161	< 0.05 U1	2.19	0.1	0.11
4/10/2018	Background	0.50	39.5	51.0	0.009 J1	< 0.005 U1	0.864	0.122	0.257	0.85	0.142	0.130	< 0.05 U1	2.54	0.1	< 0.01 U1
6/11/2018	Background	0.23	27.5	57.2	0.008 J1	< 0.005 U1	0.640	0.092	0.766	0.90	0.169	0.110	< 0.05 U1	2.10	0.09 J1	< 0.01 U1
8/21/2018	Background	0.15	20.1	60.6	0.007 J1	< 0.005 U1	0.572	0.076	0.360	0.98	0.144	0.090	< 0.05 U1	1.85	0.08 J1	0.04 J1
10/15/2018	Background	0.10	19.2	63.3	< 0.02 U1	< 0.01 U1	0.454	0.062	0.467	0.92	0.133	0.079	< 0.05 U1	2 J1	0.05 J1	< 0.1 U1
12/6/2018	Background	0.06 J1	16.4	68.8	< 0.02 U1	< 0.01 U1	0.355	0.055	0.384	0.96	0.120	0.080	< 0.05 U1	2.41	0.04 J1	< 0.1 U1
2/12/2019	Detection	0.05 J1	13.2	75.7	< 0.02 U1	< 0.01 U1	0.326	0.056	0.3448	0.98	0.109	0.071	< 0.05 U1	2.52	0.04 J1	< 0.1 U1
4/9/2019	Assessment	0.05 J1	11.9	80.8	< 0.02 U1	< 0.01 U1	0.415	0.062	0.512	0.92	0.09 J1	0.087	< 0.05 U1	2.36	0.05 J1	< 0.1 U1
5/29/2019	Assessment	0.05 J1	9.20	85.3	< 0.02 U1	< 0.01 U1	0.343	0.03 J1	0.457	0.99	< 0.02 U1	0.073	< 0.05 U1	2.12	0.05 J1	< 0.1 U1
10/1/2019	Assessment	0.03 J1	9.46	100	< 0.02 U1	< 0.01 U1	0.295	0.055	0.524	1.06	0.08 J1	0.0699	< 0.2 U1	2.84	0.08 J1	< 0.1 U1
2/11/2020	Assessment	0.03 J1	8.01	112	< 0.02 U1	< 0.01 U1	0.221	0.03 J1	0.34769	1.00	0.06 J1	0.0629	< 0.2 U1	3.89	0.04 J1	< 0.1 U1
4/20/2020	Assessment	0.02 J1	7.30	113	< 0.02 U1	< 0.01 U1	0.2 J1	0.02 J1	1.935	1.07	< 0.05 U1	0.0646	< 0.2 U1	2.08	0.04 J1	< 0.1 U1
10/6/2020	Assessment	0.04 J1	6.69	130	< 0.02 U1	< 0.01 U1	0.293	0.03 J1	0.763	1.02	0.07 J1	0.0630	< 0.2 U1	2.21	0.06 J1	< 0.1 U1
2/8/2021	Assessment	0.02 J1	6.62	151	< 0.02 U1	< 0.01 U1	0.261	0.02 J1	0.915	1.15	< 0.05 U1	0.0620	< 0.2 U1	2 J1	0.03 J1	< 0.1 U1
4/12/2021	Assessment	0.02 J1	6.19	157	< 0.007 U1	< 0.004 U1	0.2 J1	0.02 J1	0.753	1.18	< 0.05 U1	0.0613	< 0.2 U1	1 J1	< 0.09 U1	< 0.04 U1
10/11/2021	Assessment	0.03 J1	6.64	208	< 0.007 U1	< 0.004 U1	0.11 J1	0.016 J1	0.36	0.91	< 0.05 U1	0.0604	< 0.2 U1	1.5	< 0.09 U1	< 0.04 U1
2/22/2022	Assessment	< 0.02 U1	6.04	218	< 0.007 U1	< 0.004 U1	0.14 J1	0.013 J1	0.72	1.15	< 0.05 U1	0.0622	< 0.2 U1	1.5	< 0.09 U1	< 0.04 U1
4/12/2022	Assessment	< 0.02 U1	5.82	213	< 0.007 U1	< 0.004 U1	0.05 J1	0.011 J1	0.66	1.11	< 0.05 U1	0.0639	< 0.2 U1	1.5	< 0.09 U1	< 0.04 U1
10/3/2022	Assessment	< 0.02 U1	5.91	245	< 0.07 U1	< 0.004 U1	0.27	0.015 J1	1.32	1.13	< 0.05 U1	0.0656	< 0.2 U1	1.6	< 0.09 U1	< 0.04 U1
2/13/2023	Assessment	< 0.02 U1	5.97	280	< 0.007 U1	< 0.004 U1	0.15 J1	0.012 J1	2.13	1.17	< 0.05 U1	0.0542	< 0.2 U1	1.7	< 0.09 U1	< 0.04 U1
4/3/2023	Assessment	0.013 J1	5.76	287	< 0.04 U1	< 0.004 U1	0.17 J1	0.012 J1	2.62	1.15	< 0.05 U1	0.063	< 0.2 U1	1.7	< 0.04 U1	< 0.02 U1
10/9/2023	Assessment	0.012 J1	4.68	273	< 0.007 U1	< 0.004 U1	0.21 J1	0.01 J1	0.78 L1, P2	1.13	< 0.05 U1	0.0566	< 0.2 U1	1.7	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1612
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
12/13/2017	Background	0.453	38.7	13.3	0.12	7.1	6.0	384
2/14/2018	Background	0.532	43.0	14.5	0.12	6.9	9.3	506
4/12/2018	Background	0.476	44.9	21.6	0.17	7.1	13.9	546
6/12/2018	Background	0.452	42.4	22.7	0.17	7.0	16.9	524
8/22/2018	Background	0.543	42.0	20.9	0.19	7.1	15.6	550
10/16/2018	Background	0.5 J1	38.1	37.1	0.21	7.3	10.8	528
12/11/2018	Background	0.439	37.9	35.3	0.20	7.4	7.8	522
2/12/2019	Detection	0.393	36.4	32.8	0.19	7.3	5.4	537
4/10/2019	Assessment	0.527	41.0	27.5	0.18	7.4	4.6	551
5/30/2019	Assessment	0.355	34.9	32.8	0.22	7.4	3.3	537
10/2/2019	Assessment	0.423	45.9	30.7	0.14	7.1	1.9	533
2/11/2020	Assessment	0.367	40.1	33.3	0.17	7.3	1.2	520
4/21/2020	Assessment	0.381	54.4	9.9	0.08	6.2	0.2 J1	495
10/7/2020	Assessment	0.399	50.7	20.0	0.16	6.8	< 0.06 U1	526
2/9/2021	Assessment	0.369	41.4	26.8	0.19	7.2	0.3 J1	555
4/13/2021	Assessment	0.339	41.6	29.6	0.19	7.3	0.4	524
10/12/2021	Assessment	0.400	42.3	27.5	0.18	7.4	< 0.06 U1	520
2/23/2022	Assessment	0.371	42.8	22.7	0.15	7.6	< 0.06 U1	520
4/13/2022	Assessment	0.394	49.9	15.2	0.13	6.7	< 0.06 U1	520
10/5/2022	Assessment	0.407	45.9 M1, P3	20.8	0.16	6.7	< 0.06 U1	510
2/14/2023	Assessment	0.388	46.0	20.3	0.14	7.1	< 0.06 U1	520
4/4/2023	Assessment	0.417	52.3	13.1	0.11	6.9	< 0.1 U1	500
10/10/2023	Assessment	0.404	45.7	12.3	0.12	7.0	< 0.1 U1	480

Table 1. Groundwater Data Summary: MW-1612

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
12/13/2017	Background	0.30	3.86	2,020	0.045	< 0.005 U1	0.437	0.274	2.942	0.12	0.331	0.109	0.06 J1	3.60	0.1	0.01 J1
2/14/2018	Background	0.08	2.61	2,560	0.01 J1	< 0.005 U1	0.190	0.149	1.358	0.12	0.083	0.121	< 0.05 U1	1.59	0.06 J1	0.03 J1
4/12/2018	Background	0.11	2.26	2,170	0.005 J1	< 0.005 U1	0.196	0.115	2.209	0.17	0.040	0.128	< 0.05 U1	1.13	0.03 J1	< 0.01 U1
6/12/2018	Background	0.07	1.82	2,170	0.006 J1	< 0.005 U1	0.206	0.094	1.580	0.17	0.038	0.132	< 0.05 U1	0.83	0.04 J1	0.01 J1
8/22/2018	Background	0.05	1.56	2,090	< 0.004 U1	< 0.005 U1	0.251	0.124	2.76	0.19	0.025	0.136	< 0.05 U1	0.67	0.03 J1	0.01 J1
10/16/2018	Background	0.02 J1	1.17	1,640	< 0.02 U1	< 0.01 U1	0.2 J1	0.242	1.051	0.21	0.02 J1	< 0.09 U1	< 0.05 U1	0.8 J1	0.04 J1	< 0.1 U1
12/11/2018	Background	0.03 J1	0.92	1,880	< 0.02 U1	< 0.01 U1	0.2 J1	0.304	3.009	0.20	< 0.02 U1	0.134	< 0.05 U1	0.7 J1	< 0.03 U1	< 0.1 U1
2/12/2019	Detection	0.02 J1	0.71	1,880	< 0.02 U1	< 0.01 U1	0.204	0.320	0.574	0.19	< 0.02 U1	0.123	< 0.05 U1	0.50 J1	< 0.03 U1	< 0.1 U1
4/10/2019	Assessment	0.03 J1	0.74	2,060	< 0.02 U1	< 0.01 U1	0.1 J1	0.339	1.25	0.18	< 0.02 U1	0.133	< 0.05 U1	0.7 J1	< 0.03 U1	< 0.1 U1
5/30/2019	Assessment	0.02 J1	0.76	1,930	< 0.02 U1	< 0.01 U1	0.257	0.228	0.621	0.22	< 0.02 U1	0.113	< 0.05 U1	0.7 J1	< 0.03 U1	< 0.1 U1
10/2/2019	Assessment	< 0.02 U1	0.56	2,150	< 0.02 U1	< 0.01 U1	0.218	0.182	1.137	0.14	< 0.05 U1	0.128	< 0.2 U1	2.01	0.05 J1	< 0.1 U1
2/11/2020	Assessment	0.05 J1	0.45	2,050	< 0.02 U1	< 0.01 U1	0.2 J1	0.121	1.888	0.17	< 0.05 U1	0.106	< 0.2 U1	2 J1	0.03 J1	< 0.1 U1
4/21/2020	Assessment	0.15	0.39	2,600	< 0.02 U1	< 0.01 U1	0.216	0.176	2.65	0.08	0.07 J1	0.107	< 0.2 U1	0.8 J1	0.03 J1	< 0.1 U1
10/7/2020	Assessment	0.03 J1	0.76	2,450	< 0.02 U1	< 0.01 U1	0.1 J1	0.183	1.765	0.16	< 0.05 U1	0.103	< 0.2 U1	< 0.4 U1	< 0.03 U1	< 0.1 U1
2/9/2021	Assessment	0.03 J1	0.50	2,400	< 0.02 U1	< 0.01 U1	0.1 J1	0.097	2.053	0.19	< 0.05 U1	0.113	< 0.2 U1	0.6 J1	< 0.03 U1	< 0.1 U1
4/13/2021	Assessment	0.04 J1	0.37	2,120	< 0.007 U1	< 0.004 U1	0.2 J1	0.125	1.572	0.19	< 0.05 U1	0.113	< 0.2 U1	0.7 J1	< 0.09 U1	< 0.04 U1
10/12/2021	Assessment	0.03 J1	0.48	2,470	< 0.007 U1	< 0.004 U1	0.18 J1	0.116	1.90	0.18	< 0.05 U1	0.115	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
2/23/2022	Assessment	< 0.04 U1	0.38	2,440	< 0.007 U1	< 0.004 U1	0.15 J1	0.091 B1	1.62	0.15	< 0.05 U1	0.129	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
4/13/2022	Assessment	< 0.02 U1	0.31	2,550	< 0.007 U1	< 0.004 U1	0.10 J1	0.115	1.75	0.13	< 0.05 U1	0.131	< 0.2 U1	0.1 J1	< 0.09 U1	< 0.04 U1
10/5/2022	Assessment	< 0.02 U1	0.33	2,390 M1, P3	< 0.007 U1	< 0.004 U1	0.39	0.096	3.01	0.16	< 0.05 U1	0.147	< 0.2 U1	0.1 J1	< 0.09 U1	< 0.04 U1
2/14/2023	Assessment	< 0.02 U1	0.34	2,620	< 0.007 U1	< 0.004 U1	0.23	0.085	1.92	0.14	< 0.05 U1	0.112	< 0.2 U1	0.2 J1	< 0.09 U1	< 0.04 U1
4/4/2023	Assessment	0.023 J1	0.32	2,520	< 0.007 U1	< 0.004 U1	0.21 J1	0.103	2.23	0.11	< 0.05 U1	0.125	< 0.2 U1	0.1 J1	< 0.04 U1	< 0.02 U1
10/10/2023	Assessment	0.026 J1	0.31	2,410	< 0.007 U1	< 0.004 U1	0.23 J1	0.075	1.91	0.12	< 0.05 U1	0.137	< 0.2 U1	0.2 J1	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1903D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.302	196	4,170	< 0.4 U1	7.0	< 2 U1	7,060
11/9/2020	Assessment	0.270	231	4,780	0.4 J1	8.0	< 0.8 U1	8,000
2/16/2021	Assessment	< 0.4 U1	169	4,940	0.5 J1	8.1	< 0.8 U1	7,440
4/14/2021	Assessment	0.275	177	4,790	0.6 J1	8.2	< 0.8 U1	7,060
10/13/2021	Assessment	0.25 J1	145	4,020	0.6 J1	8.3	< 0.8 U1	6,400
2/24/2022	Assessment	0.22 J1	136	4,130	0.5 J1	8.5	< 0.8 U1	6,400
4/14/2022	Assessment	0.28	137	3,760	0.5 J1	7.8	< 0.8 U1	6,000
10/5/2022	Assessment	0.4 J1	139	3,410	0.5 J1	7.6	2.4 J1	5,500
2/15/2023	Assessment	0.3 J1	124	3,700	0.5 J1	8.1	< 0.8 U1	6,020 S7, S1
4/5/2023	Assessment	0.3 J1	117	3,410	0.4 J1	8.0	< 2 U1	5,200
10/11/2023	Assessment	0.3 J1	106	3,340	0.6 J1	8.0	< 2 U1	5,680

Table 1. Groundwater Data Summary: MW-1903D

**Clinch River - Pond 1
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.22	8.73	15,000	< 0.04 U1	< 0.02 U1	0.2 J1	0.471	7.24	< 0.4 U1	0.1 J1	0.425	< 0.2 U1	13.7	0.1 J1	< 0.2 U1
11/9/2020	Assessment	< 0.1 U1	6.47	24,700	< 0.1 U1	< 0.05 U1	< 0.2 U1	< 0.1 U1	8.28	0.4 J1	< 0.2 U1	0.459	< 0.2 U1	20.9	< 0.2 U1	< 0.5 U1
2/16/2021	Assessment	< 0.4 U1	7.88	23,200	< 0.4 U1	< 0.2 U1	< 0.8 U1	< 0.4 U1	10.34	0.5 J1	< 1 U1	0.442	< 0.2 U1	20 J1	< 0.6 U1	< 2 U1
4/14/2021	Assessment	0.1 J1	7.27	20,300	< 0.04 U1	< 0.02 U1	< 0.2 U1	0.06 J1	6.54	0.6 J1	< 0.2 U1	0.430	< 0.2 U1	21.9	< 0.4 U1	< 0.2 U1
10/13/2021	Assessment	0.3 J1	6.8	15,100	< 0.07 U1	< 0.04 U1	< 0.4 U1	0.07 J1	7.57	0.6 J1	< 0.5 U1	0.402	< 0.2 U1	25	< 0.9 U1	< 0.4 U1
2/24/2022	Assessment	< 0.2 U1	6.3	16,200	< 0.07 U1	< 0.04 U1	0.5 J1	0.05 J1	7.27	0.5 J1	< 0.5 U1	0.395	< 0.2 U1	24	< 0.9 U1	< 0.4 U1
4/14/2022	Assessment	0.6	6.7	12,500	< 0.04 U1	< 0.02 U1	< 0.2 U1	0.05 J1	6.24	0.5 J1	< 0.3 U1	0.351	< 0.2 U1	21.6	< 0.5 U1	< 0.2 U1
10/5/2022	Assessment	2.7	7.5	9,820	< 0.1 U1	< 0.08 U1	3.1 J1	0.11 J1	7.23	0.5 J1	< 1 U1	0.355	< 0.2 U1	18	< 2 U1	< 0.2 U1
2/15/2023	Assessment	1.0 J1	7.1	13,500	< 0.1 U1	< 0.08 U1	< 0.8 U1	< 0.06 U1	5.68 R2	0.5 J1	< 1 U1	0.326	< 0.2 U1	22	< 2 U1	< 0.2 U1
4/5/2023	Assessment	1.2 J1	4.4	9,630 M1	< 0.1 U1	< 0.08 U1	1 J1	< 0.1 U1	7.44	0.4 J1	< 1 U1	0.38 M1	< 0.2 U1	18	< 0.8 U1	< 0.2 U1
10/11/2023	Assessment	1 J1	5.3	9,810	< 0.1 U1	< 0.08 U1	2 J1	< 0.1 U1	7.35	0.6 J1	< 1 U1	0.366	< 0.2 U1	18	< 0.8 U1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1903S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.350	95.4	1,190	0.11	6.3	< 0.06 U1	2,320
11/9/2020	Assessment	0.383	80.0	937	0.1 J1	7.0	< 0.2 U1	2,020
2/16/2021	Assessment	0.355	70.2	879	0.15	7.2	< 0.2 U1	1,520
4/14/2021	Assessment	0.355	83.6	1,050	0.15	7.3	< 0.2 U1	1,780
10/13/2021	Assessment	0.381	83.4	989	0.13 J1	7.4	< 0.2 U1	2,000
2/24/2022	Assessment	0.361	81.4 P3	1,030	0.09 J1	7.5	< 0.2 U1	2,000
4/14/2022	Assessment	0.380	87.2 M1, P3	1,000	0.12 J1	6.8	< 0.2 U1	1,700
10/5/2022	Assessment	0.407	91.7	1,040	0.12 J1	6.6	< 0.2 U1	1,900
2/15/2023	Assessment	0.375	95.5	1,070	0.1 J1	6.8	< 0.2 U1	1,990
4/5/2023	Assessment	0.41	92.9	1,060	0.1 J1	7.0	< 0.3 U1	2,000
10/11/2023	Assessment	0.37	77.0	1,010	0.13 J1	6.9	< 0.3 U1	1,940

Table 1. Groundwater Data Summary: MW-1903S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.06 J1	2.99	9,280	0.03 J1	< 0.01 U1	0.362	0.208	4.55	0.11	0.713	0.194	< 0.2 U1	1 J1	0.06 J1	< 0.1 U1
11/9/2020	Assessment	0.13	1.76	7,420	< 0.02 U1	< 0.01 U1	0.1 J1	0.120	3.71	0.1 J1	< 0.05 U1	0.169	< 0.2 U1	0.9 J1	< 0.03 U1	< 0.1 U1
2/16/2021	Assessment	0.04 J1	1.51	7,610	< 0.02 U1	< 0.01 U1	0.2 J1	0.097	6.772	0.15	0.1 J1	0.158	< 0.2 U1	0.6 J1	< 0.03 U1	< 0.1 U1
4/14/2021	Assessment	0.07 J1	1.44	8,020	0.01 J1	< 0.004 U1	0.08 J1	0.079	3.68	0.15	0.08 J1	0.164	< 0.2 U1	0.5 J1	< 0.09 U1	< 0.04 U1
10/13/2021	Assessment	0.06 J1	1.18	7,790 M1, P3	< 0.07 U1	< 0.004 U1	0.19 J1	0.081	3.88	0.13 J1	< 0.05 U1	0.186	< 0.2 U1	0.5	< 0.09 U1	< 0.04 U1
2/24/2022	Assessment	0.08 J1	1.02	7,910	0.012 J1	< 0.004 U1	0.15 J1	0.091	3.62	0.09 J1	0.08 J1	0.199 M1, P3	< 0.2 U1	0.4 J1	< 0.09 U1	< 0.04 U1
4/14/2022	Assessment	0.19	0.95	7,600 M1, P3	0.008 J1	< 0.004 U1	0.11 J1	0.090	3.90	0.12 J1	0.08 J1	0.189 P3	< 0.2 U1	0.4 J1	< 0.09 U1	< 0.04 U1
10/5/2022	Assessment	0.07 J1	0.97	8,430	0.010 J1	< 0.004 U1	0.15 J1	0.099	6.90	0.12 J1	0.08 J1	0.191	< 0.2 U1	0.4 J1	< 0.09 U1	< 0.04 U1
2/15/2023	Assessment	0.07 J1	0.92	8,840	0.011 J1	< 0.004 U1	0.14 J1	0.085	4.62	0.1 J1	0.08 J1	0.160	< 0.2 U1	0.5	< 0.09 U1	< 0.04 U1
4/5/2023	Assessment	0.04 J1	0.9	8,220	< 0.04 U1	< 0.02 U1	0.8 J1	0.08 J1	6.01	0.1 J1	< 0.3 U1	0.196	< 0.2 U1	0.6 J1	< 0.2 U1	< 0.1 U1
10/11/2023	Assessment	0.07 J1	0.8	7,880	< 0.04 U1	< 0.02 U1	0.8 J1	0.09 J1	4.19	0.13 J1	< 0.3 U1	0.182	< 0.2 U1	< 0.5 U1	< 0.2 U1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1904D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.504	8.82	84.3	1.17	7.3	8.0	795
11/9/2020	Assessment	0.472	8.68	92.3	1.18	8.0	< 0.06 U1	802
2/15/2021	Assessment	0.500	8.24	91.5	1.17	8.2	< 0.06 U1	829
4/14/2021	Assessment	0.505	8.52	93.9	1.16	8.3	< 0.06 U1	809
10/13/2021	Assessment	0.489	8.3	93.4	1.09	8.5	< 0.3 U1	830
2/24/2022	Assessment	0.491	8.30	99.9	1.13	8.6	< 0.06 U1	840
4/14/2022	Assessment	0.550	8.85	95.6	1.06	7.9	< 0.06 U1	850
10/5/2022	Assessment	0.560	8.60	97.0	1.06	8.0	< 0.06 U1	850
2/15/2023	Assessment	0.409	19.4	98.7	1.09	8.1	< 0.06 U1	850
4/5/2023	Assessment	0.553	8.81	96.9	1.06	8.2	< 0.1 U1	830
10/11/2023	Assessment	0.522	8.44	98.8	1.05	8.1	< 0.1 U1	850

Table 1. Groundwater Data Summary: MW-1904D

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.26	2.76	712	< 0.02 U1	< 0.01 U1	0.229	0.162	2.18	1.17	0.06 J1	0.154	< 0.2 U1	4.60	< 0.03 U1	< 0.1 U1
11/9/2020	Assessment	3.23	2.48	850	< 0.02 U1	< 0.01 U1	0.1 J1	0.05 J1	3.103	1.18	< 0.05 U1	0.168	< 0.2 U1	4.32	0.08 J1	< 0.1 U1
2/15/2021	Assessment	0.91	2.78	848	< 0.1 U1	< 0.05 U1	0.3 J1	< 0.1 U1	1.402	1.17	< 0.05 U1	0.165	< 0.2 U1	6 J1	< 0.2 U1	< 0.1 U1
4/14/2021	Assessment	0.59	2.51	841	< 0.007 U1	< 0.004 U1	0.08 J1	0.03 J1	1.186	1.16	< 0.05 U1	0.160	< 0.2 U1	5.07	< 0.09 U1	< 0.04 U1
10/13/2021	Assessment	0.59	2.47	881	< 0.007 U1	< 0.004 U1	0.27	0.027	0.99	1.09	< 0.05 U1	0.157	< 0.2 U1	6.0	< 0.09 U1	< 0.04 U1
2/24/2022	Assessment	0.25	2.40	981	< 0.007 U1	< 0.004 U1	0.21	0.043	1.93	1.13	< 0.05 U1	0.172	< 0.2 U1	7.3	< 0.09 U1	< 0.04 U1
4/14/2022	Assessment	0.22	1.96	980	< 0.007 U1	< 0.004 U1	0.05 J1	0.041	1.60	1.06	< 0.05 U1	0.177	< 0.2 U1	6.1	< 0.09 U1	< 0.04 U1
10/5/2022	Assessment	0.25	1.76	949	< 0.007 U1	< 0.004 U1	0.15 J1	0.117	1.53	1.06	< 0.05 U1	0.183	< 0.2 U1	4.9	< 0.09 U1	< 0.04 U1
2/15/2023	Assessment	0.17	2.74	1,370	0.013 J1	< 0.004 U1	0.17 J1	0.197	2.78	1.09	< 0.05 U1	0.0892	< 0.2 U1	2.1	< 0.09 U1	< 0.04 U1
4/5/2023	Assessment	0.117	1.30	925	< 0.007 U1	< 0.004 U1	0.17 J1	0.086	2.21	1.06	< 0.05 U1	0.170	< 0.2 U1	3.4	< 0.04 U1	< 0.02 U1
10/11/2023	Assessment	0.140	1.36	1,050	< 0.007 U1	< 0.004 U1	0.19 J1	0.186	0.74	1.05	< 0.05 U1	0.188	< 0.2 U1	3.6	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1904S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.541	11.5	10.9	0.42	7.3	0.2 J1	411
11/9/2020	Assessment	0.452	18.5	10.1	0.29	7.3	< 0.06 U1	384
2/15/2021	Assessment	0.451	18.4	9.8	0.30	7.4	< 0.06 U1	405
4/14/2021	Assessment	0.457	21.1	10.0	0.28	7.3	< 0.06 U1	366
10/13/2021	Assessment	0.405	20.1	10.2	0.25	7.5	< 0.06 U1	380
2/24/2022	Assessment	0.406	19.4	10.4	0.23	7.5	< 0.06 U1	390
4/14/2022	Assessment	0.424	22.1	10.1	0.21	6.7	< 0.06 U1	360
10/5/2022	Assessment	0.436	19.5	10.7	0.23	6.4	< 0.06 U1	350
2/15/2023	Assessment	0.524	8.86	10.8	0.23	7.1	< 0.06 U1	380
4/5/2023	Assessment	0.386	19.7	10.5	0.21	7.1	< 0.1 U1	350
10/11/2023	Assessment	0.345	20.7	10.3	0.18	7.0	< 0.1 U1	350

Table 1. Groundwater Data Summary: MW-1904S

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.18	3.13	866	< 0.02 U1	< 0.01 U1	0.2 J1	0.218	1.471	0.42	0.1 J1	0.115	< 0.2 U1	3.52	< 0.03 U1	< 0.1 U1
11/9/2020	Assessment	0.16	2.64	1,230	< 0.02 U1	< 0.01 U1	0.1 J1	0.118	4.591	0.29	< 0.05 U1	0.113	< 0.2 U1	2 J1	0.07 J1	< 0.1 U1
2/15/2021	Assessment	0.08 J1	2.97	1,260	< 0.02 U1	< 0.01 U1	0.2 J1	0.123	3.355	0.30	< 0.05 U1	0.0966	< 0.2 U1	2.30	< 0.03 U1	< 0.1 U1
4/14/2021	Assessment	0.07 J1	2.63	1,300	0.009 J1	< 0.004 U1	0.06 J1	0.141	1.438	0.28	< 0.05 U1	0.0990	< 0.2 U1	1 J1	< 0.09 U1	< 0.04 U1
10/13/2021	Assessment	0.05 J1	2.08	1,290	0.008 J1	< 0.004 U1	0.44	0.116	2.42	0.25	< 0.05 U1	0.0940	< 0.2 U1	1.3	< 0.09 U1	< 0.04 U1
2/24/2022	Assessment	0.28	3.26	1,300	0.013 J1	< 0.004 U1	0.13 J1	0.142	1.65	0.23	0.10 J1	0.0955	< 0.2 U1	1.2	< 0.09 U1	< 0.04 U1
4/14/2022	Assessment	0.13	2.51	1,400	0.008 J1	< 0.004 U1	0.22	0.178	1.80	0.21	< 0.05 U1	0.0880	< 0.2 U1	1.4	< 0.09 U1	< 0.04 U1
10/5/2022	Assessment	0.08 J1	2.88	1,300	0.011 J1	0.010 J1	0.15 J1	0.162	2.70	0.23	< 0.05 U1	0.108	< 0.2 U1	1.6	< 0.09 U1	< 0.04 U1
2/15/2023	Assessment	0.15	1.68	1,080	< 0.007 U1	< 0.004 U1	0.11 J1	0.076	2.12	0.23	0.07 J1	0.161	< 0.2 U1	4.6	< 0.09 U1	< 0.04 U1
4/5/2023	Assessment	0.062 J1	2.27	1,190	0.014 J1	< 0.004 U1	0.16 J1	0.221	3.32	0.21	< 0.05 U1	0.0917	< 0.2 U1	1.0	0.06 J1	< 0.02 U1
10/11/2023	Assessment	0.037 J1	2.02	1,460	0.014 J1	< 0.004 U1	0.21 J1	0.249	1.71	0.18	< 0.05 U1	0.0864	< 0.2 U1	0.6	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1905D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.515	155	3,220	< 0.4 U1	7.0	8.1	5,180
11/9/2020	Assessment	0.519	181	3,140	0.3 J1	7.7	< 0.3 U1	5,240
2/16/2021	Assessment	< 0.2 U1	156	3,260	0.32	7.8	< 0.3 U1	5,580
4/14/2021	Assessment	0.534	172	3,350	0.43	7.9	< 0.3 U1	5,380
10/13/2021	Assessment	0.407	171	3,350	0.4	8.1	< 0.3 U1	5,600
2/24/2022	Assessment	0.5 J1	185	3,400	0.4	8.3	< 0.3 U1	5,200 P1
4/14/2022	Assessment	0.61	199	3,450	0.4 J1	7.5	< 0.8 U1	5,600
10/6/2022	Assessment	0.64	193	3,640	0.4 J1	7.3	< 0.8 U1	5,900
2/15/2023	Assessment	0.6 J1	169	3,360	< 0.3 U1	7.6	< 8 U1	5,300
4/5/2023	Assessment	0.6 J1	177	3,280	< 0.3 U1	7.7	< 2 U1	5,700
10/11/2023	Assessment	0.6 J1	181	3,350	0.4 J1	7.6	< 2 U1	5,760

Table 1. Groundwater Data Summary: MW-1905D

**Clinch River - Pond 1
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.31	5.40	5,080	< 0.04 U1	< 0.02 U1	0.3 J1	0.163	7.36	< 0.4 U1	< 0.1 U1	0.991	< 0.2 U1	7.17	< 0.06 U1	< 0.1 U1
11/9/2020	Assessment	< 0.1 U1	5.21	12,600	< 0.1 U1	< 0.05 U1	< 0.2 U1	< 0.1 U1	10.38	0.3 J1	< 0.2 U1	0.935	< 0.2 U1	4 J1	< 0.2 U1	< 0.5 U1
2/16/2021	Assessment	< 0.2 U1	3.03	5,320	< 0.2 U1	< 0.1 U1	< 0.4 U1	< 0.2 U1	11.05	0.32	1 J1	0.501	< 0.2 U1	< 4 U1	< 0.3 U1	< 1 U1
4/14/2021	Assessment	< 0.2 U1	4.92	10,800	< 0.07 U1	< 0.04 U1	< 0.4 U1	0.04 J1	8.19	0.43	< 0.05 U1	1.05	< 0.4 U1	4 J1	< 0.9 U1	< 0.04 U1
10/13/2021	Assessment	0.04 J1	3.42	10,200	< 0.07 U1	0.005 J1	0.21	0.016 J1	11.77	0.4	< 0.5 U1	1.05	< 0.2 U1	4.2	< 0.09 U1	< 0.4 U1
2/24/2022	Assessment	< 0.4 U1	3.2	9,380	< 0.1 U1	< 0.08 U1	1.4 J1	< 0.06 U1	9.89	0.4	< 1 U1	1.17	< 0.2 U1	7 J1	< 2 U1	< 0.4 U1
4/14/2022	Assessment	< 0.1 U1	2.9	8,970	< 0.04 U1	< 0.02 U1	< 0.2 U1	0.03 J1	8.45	0.4 J1	< 0.3 U1	0.963	< 0.4 U1	5.9	< 0.5 U1	< 0.2 U1
10/6/2022	Assessment	< 0.1 U1	2.3	9,040	< 0.04 U1	< 0.02 U1	0.2 J1	0.03 J1	9.66	0.4 J1	< 0.3 U1	1.20	< 0.4 U1	4.7	< 0.5 U1	< 0.2 U1
2/15/2023	Assessment	< 0.4 U1	2.1	9,170	0.008 J1	< 0.08 U1	44.6	0.07 J1	9.15 R2	< 0.3 U1	< 1 U1	1.12	< 0.2 U1	7 J1	< 2 U1	< 0.2 U1
4/5/2023	Assessment	< 0.2 U1	1.9 J1	8,550	< 0.1 U1	< 0.08 U1	2 J1	< 0.1 U1	12.87	< 0.3 U1	< 1 U1	1.14	< 0.2 U1	3 J1	< 0.8 U1	< 0.2 U1
10/11/2023	Assessment	< 0.2 U1	1.8 J1	9,130	< 0.1 U1	< 0.08 U1	2 J1	< 0.1 U1	8.00	0.4 J1	< 1 U1	1.19	< 0.2 U1	3 J1	< 0.8 U1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1905S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.184	83.5	334	0.33	6.7	69.3	810
11/9/2020	Assessment	0.236	66.8	177	0.36	7.5	72.5	598
2/16/2021	Assessment	0.230	81.8	1,660	0.32	7.8	6.4	2,930
4/14/2021	Assessment	0.551	234	1,740	0.35	7.7	4.0	2,840
10/13/2021	Assessment	0.500	242	1,730	0.33	7.9	2.6	3,400
2/24/2022	Assessment	0.486	231	1,730	0.30	8.5	2.7	3,300
4/14/2022	Assessment	0.594	263	1,750	0.26	7.3	1.5	3,000
10/6/2022	Assessment	0.58	249 M1, P3	1,870	0.28	7.2	1.4	3,400
2/15/2023	Assessment	0.522	250	1,780	0.2 J1	7.4	1.7 J1	2,970 S7
4/5/2023	Assessment	0.560	239	1,740	0.2 J1	7.5	1.5 J1	3,100
10/11/2023	Assessment	0.511	233	1,780	0.3	7.4	1.6 J1	3,780

Table 1. Groundwater Data Summary: MW-1905S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.12	2.39	166	< 0.02 U1	< 0.01 U1	0.348	1.22	1.886	0.33	0.1 J1	0.110	< 0.2 U1	97.0	0.7	< 0.1 U1
11/9/2020	Assessment	1.62	6.25	285	< 0.02 U1	< 0.01 U1	0.285	0.642	2.515	0.36	0.1 J1	0.113	< 0.2 U1	93.6	0.6	< 0.1 U1
2/16/2021	Assessment	5.15	2.12	519	< 0.02 U1	0.02 J1	0.210	0.462	5.84	0.32	0.218	0.137	< 0.2 U1	82.6	0.5	< 0.1 U1
4/14/2021	Assessment	0.08 J1	7.06	3,490	0.01 J1	< 0.004 U1	0.05 J1	0.120	4.36	0.35	< 0.05 U1	0.517	< 0.2 U1	8.42	< 0.09 U1	< 0.04 U1
10/13/2021	Assessment	0.05 J1	2.66	3,960	< 0.04 U1	< 0.004 U1	0.41	0.118	7.03	0.33	< 0.05 U1	0.530	< 0.2 U1	7.9	< 0.09 U1	< 0.04 U1
2/24/2022	Assessment	0.06 J1	4.66	5,750	< 0.007 U1	0.024	0.39	0.090	5.47	0.30	0.06 J1	0.587	< 0.2 U1	8.1	< 0.09 U1	< 0.04 U1
4/14/2022	Assessment	0.03 J1	3.06	5,420	< 0.007 U1	< 0.004 U1	0.11 J1	0.075	4.61	0.26	< 0.05 U1	0.530	< 0.2 U1	5.5	< 0.09 U1	< 0.04 U1
10/6/2022	Assessment	< 0.1 U1	2.3	5,440 M1, P3	< 0.04 U1	< 0.02 U1	0.4 J1	0.08 J1	6.09	0.28	< 0.3 U1	0.581 M1	< 0.2 U1	5.1	< 0.5 U1	< 0.2 U1
2/15/2023	Assessment	0.03 J1	1.38	6,040	< 0.007 U1	< 0.004 U1	0.17 J1	0.065	4.70	0.2 J1	< 0.05 U1	0.542	< 0.2 U1	4.6	< 0.09 U1	< 0.04 U1
4/5/2023	Assessment	0.026 J1	1.93	5,130	< 0.007 U1	< 0.004 U1	0.30	0.060	7.92	0.2 J1	< 0.05 U1	0.504	< 0.2 U1	4.3	< 0.04 U1	< 0.02 U1
10/11/2023	Assessment	0.026 J1	1.26	6,160	< 0.007 U1	< 0.004 U1	0.19 J1	0.052	4.76	0.3	0.14 J1	0.562	< 0.2 U1	4.1	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1906D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	< 0.02 U1	11.7	14.7	0.21	8.6	30.5	116
11/10/2020	Assessment	< 0.02 U1	19.0	13.1	0.14	8.6	26.5	132
2/15/2021	Assessment	< 0.02 U1	23.0	3.6	0.24	8.3	6.2	135
4/13/2021	Assessment	0.009 J1	22.6	11.5	0.14	8.4	23.9	146
10/12/2021	Assessment	0.011 J1	27.4	10.8	0.12	8.5	24.2	170
2/22/2022	Assessment	< 0.009 U1	27.0	11.9	0.11	8.5	51.4	230
4/13/2022	Assessment	0.020 J1	30.3	13.5	0.12	8.0	93.3	290
10/4/2022	Assessment	0.022 J1	29.7	14.2	0.11	7.2	92.9	300
2/14/2023	Assessment	0.021 J1	32.1	13.9	0.11	7.9	92.1	330
4/4/2023	Assessment	0.023 J1	35.4	13.3	0.1	8.0	91.0	330
10/10/2023	Assessment	0.024 J1	37.0	14.5	0.1	7.9	108	400

Table 1. Groundwater Data Summary: MW-1906D

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.77	6.47	18.4	< 0.02 U1	0.01 J1	0.2 J1	0.623	2.814	0.21	0.09 J1	0.0139	< 0.2 U1	39.9	0.3	< 0.1 U1
11/10/2020	Assessment	1.03	4.63	23.5	< 0.02 U1	0.02 J1	0.09 J1	0.500	1.845	0.14	0.2 J1	0.0141	< 0.2 U1	34.8	0.3	< 0.1 U1
2/15/2021	Assessment	0.15	2.37	27.2	< 0.02 U1	< 0.01 U1	0.1 J1	0.572	1.015	0.24	0.05 J1	0.0104	< 0.2 U1	12.5	0.09 J1	< 0.1 U1
4/13/2021	Assessment	0.54	3.44	24.6	< 0.007 U1	0.01 J1	0.2 J1	0.486	1.034	0.14	0.08 J1	0.0141	< 0.2 U1	21.1	0.2 J1	< 0.04 U1
10/12/2021	Assessment	0.25	3.34	27.9	< 0.007 U1	0.005 J1	0.23	0.433	2.03	0.12	< 0.05 U1	0.0139	< 0.2 U1	17.2	0.12 J1	< 0.04 U1
2/22/2022	Assessment	0.04 J1	2.74	30.8	< 0.007 U1	< 0.004 U1	0.17 J1	0.474	2.00	0.11	< 0.05 U1	0.0130	< 0.2 U1	10.8	< 0.09 U1	< 0.04 U1
4/13/2022	Assessment	0.09 J1	3.53	39.2	< 0.007 U1	< 0.004 U1	< 0.04 U1	0.760	1.97	0.12	< 0.05 U1	0.0144	< 0.2 U1	10.1	< 0.09 U1	< 0.04 U1
10/4/2022	Assessment	0.06 J1	3.08	36.6	< 0.007 U1	< 0.004 U1	0.16 J1	0.783	2.12	0.11	< 0.05 U1	0.015	< 0.2 U1	8.8	< 0.09 U1	< 0.04 U1
2/14/2023	Assessment	0.07 J1	2.88	37.5	< 0.007 U1	< 0.004 U1	0.23	0.880	3.04	0.11	0.11 J1	0.0119	< 0.2 U1	7.0	< 0.09 U1	< 0.04 U1
4/4/2023	Assessment	0.061 J1	2.92	40.7	< 0.007 U1	< 0.004 U1	0.15 J1	0.906	1.84	0.1	< 0.05 U1	0.0127	< 0.2 U1	4.8	0.05 J1	< 0.02 U1
10/10/2023	Assessment	0.102	2.40	38.6	< 0.007 U1	0.004 J1	0.24 J1	0.754	0.69	0.1	0.08 J1	0.0121	< 0.2 U1	5.2	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1906S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.375	39.3	19.7	0.51	6.4	147	297
11/10/2020	Assessment	0.407	45.6	15.4	0.45	8.7	124	294
2/15/2021	Assessment	0.415	41.3	14.6	0.52	8.3	133	297
4/13/2021	Assessment	0.404	43.0	15.0	0.49	7.8	131	283
10/12/2021	Assessment	0.431	47.5	13.4	0.50	9.0	133	290
2/22/2022	Assessment	0.408	48.5	14.5	0.50	9.0	152	300
4/13/2022	Assessment	0.449	53.7	14.4	0.48	8.5	144	310
10/4/2022	Assessment	0.410	48.6	13.5	0.45	8.5	131	280
2/14/2023	Assessment	0.340	47.9	14.6	0.42	8.9	131	300
4/4/2023	Assessment	0.339	45.1	13.8	0.42	8.8	128	280
10/10/2023	Assessment	0.334	40.3	12.9	0.42	9.0	122	270

Table 1. Groundwater Data Summary: MW-1906S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.16	3.61	62.4	< 0.02 U1	< 0.01 U1	0.2 J1	1.31	2.366	0.51	0.2 J1	0.121	< 0.2 U1	451	0.5	< 0.1 U1
11/10/2020	Assessment	0.29	4.15	57.6	< 0.02 U1	< 0.01 U1	0.07 J1	0.457	5.343	0.45	< 0.05 U1	0.150	< 0.2 U1	389	0.4	< 0.1 U1
2/15/2021	Assessment	0.15	3.79	58.4	< 0.02 U1	0.03 J1	0.07 J1	0.443	1.7664	0.52	< 0.05 U1	0.151	< 0.2 U1	337	0.4	< 0.1 U1
4/13/2021	Assessment	0.20	3.67	59.4	< 0.007 U1	< 0.004 U1	0.2 J1	0.485	1.169	0.49	< 0.05 U1	0.146	< 0.2 U1	380	0.5 J1	< 0.04 U1
10/12/2021	Assessment	0.25	5.39	61.7	< 0.007 U1	0.005 J1	0.24	0.320	2.11	0.50	< 0.05 U1	0.172	< 0.2 U1	413	0.43 J1	< 0.04 U1
2/22/2022	Assessment	0.15	5.05	60.8	< 0.007 U1	0.007 J1	0.13 J1	0.298	1.04	0.50	< 0.05 U1	0.173	< 0.2 U1	517	0.38 J1	< 0.04 U1
4/13/2022	Assessment	0.17	5.91	60.6	< 0.007 U1	< 0.004 U1	0.06 J1	0.336	2.14	0.48	0.13 J1	0.165	< 0.2 U1	467 M1	0.41 J1	< 0.04 U1
10/4/2022	Assessment	0.14	5.90	52.7	< 0.007 U1	< 0.004 U1	0.14 J1	0.318	1.94	0.45	< 0.05 U1	0.170	< 0.2 U1	374	0.41 J1	< 0.04 U1
2/14/2023	Assessment	0.16	8.06	54.1	< 0.007 U1	< 0.004 U1	0.23	0.381	3.72	0.42	< 0.05 U1	0.141	< 0.2 U1	410	0.37 J1	< 0.04 U1
4/4/2023	Assessment	0.146	7.26	50.6	< 0.007 U1	< 0.004 U1	0.18 J1	0.300	2.02	0.42	< 0.05 U1	0.160	< 0.2 U1	399	0.45 J1	< 0.02 U1
10/10/2023	Assessment	0.173	8.11	44.3	< 0.007 U1	< 0.004 U1	0.21 J1	0.278	1.09	0.42	< 0.05 U1	0.157	< 0.2 U1	310	0.37 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1907D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/23/2020	Assessment	< 0.02 U1	53.1	5.1	0.13	6.8	61.2	360
11/10/2020	Assessment	< 0.02 U1	59.9	3.6	0.14	7.4	37.1	300
2/16/2021	Assessment	< 0.02 U1	53.7	3.6	0.15	7.6	34.9	325
4/15/2021	Assessment	0.01 J1	57.1	3.5	0.16	7.6	33.5	299
10/14/2021	Assessment	0.01 J1	53.1	3.38	0.12	7.9	30.4	300
2/25/2022	Assessment	0.024 J1	55.7	3.52	0.1	8.0	33.0	310
4/14/2022	Assessment	0.010 J1	53.7	3.11	0.10	7.2	32.2	310
10/6/2022	Assessment	0.009 J1	51.0	3.45	0.10	7.2	32.2	290
2/16/2023	Assessment	0.011 J1	54.8	3.21	0.09	7.5	30.9	290
4/6/2023	Assessment	0.011 J1	55.0	3.15	0.09	7.5	30.9	290
10/12/2023	Assessment	0.009 J1	50.8	3.12	0.09	7.5	30.2	290

Table 1. Groundwater Data Summary: MW-1907D

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/23/2020	Assessment	0.25	2.19	43.0	< 0.02 U1	< 0.01 U1	0.432	1.55	1.12	0.13	0.09 J1	0.00423	< 0.2 U1	7.64	0.04 J1	< 0.1 U1
11/10/2020	Assessment	0.08 J1	2.11	37.7	< 0.02 U1	< 0.01 U1	0.07 J1	1.01	2.074	0.14	< 0.05 U1	0.00399	< 0.2 U1	2.09	< 0.03 U1	< 0.1 U1
2/16/2021	Assessment	0.07 J1	1.88	38.4	< 0.02 U1	< 0.01 U1	0.210	0.633	1.718	0.15	< 0.05 U1	0.00376	< 0.2 U1	2.36	0.1 J1	< 0.1 U1
4/15/2021	Assessment	0.06 J1	1.60	36.8	0.009 J1	< 0.004 U1	0.05 J1	0.387	1.282	0.16	< 0.05 U1	0.00380	< 0.2 U1	2.33	< 0.09 U1	< 0.04 U1
10/14/2021	Assessment	0.05 J1	0.98	34.9	< 0.007 U1	< 0.004 U1	0.25	0.206	1.83	0.12	0.06 J1	0.00383	< 0.2 U1	1.6	< 0.09 U1	< 0.04 U1
2/25/2022	Assessment	0.05 J1	1.34	38.4	0.01 J1	< 0.004 U1	0.29	0.318	1.94	0.1	< 0.05 U1	0.00452	< 0.2 U1	2.6	< 0.09 U1	< 0.04 U1
4/14/2022	Assessment	0.04 J1	1.32	35.5	< 0.007 U1	< 0.004 U1	0.06 J1	0.280	1.88	0.10	< 0.05 U1	0.00402	< 0.2 U1	2.1	< 0.09 U1	< 0.04 U1
10/6/2022	Assessment	0.05 J1	1.15	33.7	0.008 J1	< 0.004 U1	0.16 J1	0.207	1.30	0.10	< 0.05 U1	0.00390	< 0.2 U1	1.6	< 0.09 U1	< 0.04 U1
2/16/2023	Assessment	0.04 J1	1.29	36.0	< 0.007 U1	< 0.004 U1	0.07 J1	0.261	1.41	0.09	< 0.05 U1	0.00355	< 0.2 U1	1.8	< 0.09 U1	< 0.04 U1
4/6/2023	Assessment	0.017 J1	1.34	36.8	0.009 J1	< 0.004 U1	0.15 J1	0.259	1.31	0.09	< 0.05 U1	0.00392	< 0.2 U1	1.9	< 0.04 U1	< 0.02 U1
10/12/2023	Assessment	0.018 J1	1.07	34.7	0.008 J1	< 0.004 U1	0.34	0.160	1.44	0.09	< 0.05 U1	0.00381	< 0.2 U1	1.8	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1907S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/23/2020	Assessment	< 0.02 U1	69.3	12.9	0.06 J1	7.0	30.9	433
11/10/2020	Assessment	< 0.02 U1	73.8	11.9	0.06 J1	7.3	20.5	399
2/16/2021	Assessment	< 0.02 U1	66.4	11.9	0.06	7.5	18.4	403
4/15/2021	Assessment	0.01 J1	70.7	12.1	0.07	7.6	17.7	383
10/14/2021	Assessment	0.01 J1	64.0	11.7	0.06	8.0	15.4	400
2/25/2022	Assessment	0.040 J1	68.0	12.0	0.04 J1	7.9	16.5	380
4/14/2022	Assessment	0.013 J1	66.8	11.3	0.04 J1	7.2	16.3	370
10/6/2022	Assessment	0.01 J1	67.4	12.2	0.04 J1	7.3	15.2	390
2/16/2023	Assessment	0.011 J1	68.9	11.7	0.05 J1	7.3	14.8	380 S7
4/6/2023	Assessment	0.009 J1	66.3 M1	11.7	0.05 J1	7.5	15.0	380
10/12/2023	Assessment	0.009 J1	62.0	11.5	0.06	7.4	14.9	380

Table 1. Groundwater Data Summary: MW-1907S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/23/2020	Assessment	1.62	0.79	55.6	< 0.02 U1	0.01 J1	0.242	13.3	2.091	0.06 J1	0.07 J1	0.00691	8.87	7.40	0.3	< 0.1 U1
11/10/2020	Assessment	0.34	0.50	49.9	< 0.02 U1	< 0.01 U1	0.1 J1	12.8	2.158	0.06 J1	0.07 J1	0.00701	8.01	1 J1	0.2 J1	< 0.1 U1
2/16/2021	Assessment	0.09 J1	0.59	55.2	< 0.02 U1	< 0.01 U1	0.221	14.0	2.061	0.06	< 0.05 U1	0.00689	9.68	1 J1	0.2 J1	< 0.1 U1
4/15/2021	Assessment	0.12	0.48	54.9	< 0.007 U1	0.009 J1	< 0.04 U1	13.2	0.921	0.07	< 0.05 U1	0.00701	10.4	1 J1	0.2 J1	< 0.04 U1
10/14/2021	Assessment	0.06 J1	0.45	51.0	< 0.007 U1	0.005 J1	0.24	11.3	1.91	0.06	< 0.05 U1	0.00708	13.4 H2	1.1	0.18 J1	< 0.04 U1
2/25/2022	Assessment	0.02 J1	0.39	54.4	< 0.007 U1	< 0.004 U1	0.26	12.2	1.51	0.04 J1	< 0.05 U1	0.00656	23	2.6	0.31 J1	< 0.04 U1
4/14/2022	Assessment	0.04 J1	0.46	50.3	< 0.007 U1	0.005 J1	0.09 J1	10.8	1.78	0.04 J1	< 0.05 U1	0.00724	17.8	2.4	0.27 J1	< 0.04 U1
10/6/2022	Assessment	0.03 J1	0.50	51.7	< 0.007 U1	< 0.004 U1	0.16 J1	9.23	1.10	0.04 J1	< 0.05 U1	0.00664	14.4	0.7	0.23 J1	< 0.04 U1
2/16/2023	Assessment	0.03 J1	0.39	53.4	< 0.007 U1	< 0.004 U1	0.12 J1	10.5	1.65	0.05 J1	< 0.05 U1	0.00628	21	0.8	0.29 J1	< 0.04 U1
4/6/2023	Assessment	0.054 J1	0.47	52.4	< 0.007 U1	0.019 J1	0.18 J1	8.72	1.58	0.05 J1	0.08 J1	0.00695	15	0.7	0.27 J1	< 0.02 U1
10/12/2023	Assessment	0.022 J1	0.44	50.4	< 0.007 U1	0.005 J1	0.19 J1	8.00	0.81	0.06	< 0.05 U1	0.00688	12.6	0.6	0.26 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1910S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/21/2020	Assessment	0.055	27.1	13.7	0.20	7.0	2.7	246
11/9/2020	Assessment	0.053	28.0	12.5	0.18	7.1	0.9	240
2/15/2021	Assessment	0.05 J1	24.1	13.6	0.22	7.8	0.7	256
4/15/2021	Assessment	0.057	25.8	13.3	0.21	7.8	0.9	247
10/13/2021	Assessment	0.062	20.1	15.3	0.22	8.1	0.67	250
2/23/2022	Assessment	0.058	22.6	15.3	0.20	8.0	1.20	250
4/12/2022	Assessment	0.057	23.7	14.0	0.17	7.4	1.22	240
10/4/2022	Assessment	0.073	20.8	16.4	0.20	7.4	0.95	250
2/15/2023	Assessment	0.062	21.3	15.8	0.19	7.8	1.18	250
4/5/2023	Assessment	0.07 J1	25.0	14.5	0.17	7.8	1.1	230
10/12/2023	Assessment	0.06 J1	20.5	16.2	0.18	7.8	0.9	250

Table 1. Groundwater Data Summary: MW-1910S

Clinch River - Pond 1
Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/21/2020	Assessment	0.17	2.32	283	< 0.02 U1	< 0.01 U1	0.397	0.619	1.635	0.20	0.466	0.0136	< 0.2 U1	17.1	0.2 J1	< 0.1 U1
11/9/2020	Assessment	0.17	1.88	268	< 0.02 U1	< 0.01 U1	0.1 J1	0.388	2.39	0.18	0.310	0.0124	< 0.2 U1	4.37	0.4	< 0.1 U1
2/15/2021	Assessment	0.1 J1	2.32	281	< 0.02 U1	< 0.01 U1	0.211	0.469	2.033	0.22	0.487	0.0128	< 0.2 U1	5.17	0.2	< 0.1 U1
4/15/2021	Assessment	0.08 J1	1.94	313	< 0.007 U1	< 0.004 U1	< 0.04 U1	0.408	1.009	0.21	0.732	0.0134	< 0.2 U1	4.54	0.3 J1	< 0.04 U1
10/13/2021	Assessment	0.03 J1	2.05	249	< 0.007 U1	< 0.004 U1	0.28	0.614	1.50	0.22	0.35	0.0161	< 0.2 U1	4.1	0.21 J1	< 0.04 U1
2/23/2022	Assessment	0.03 J1	1.86	285	< 0.007 U1	< 0.004 U1	0.09 J1	0.626 B1	2.46	0.20	0.24	0.0158	< 0.2 U1	3.9	0.19 J1	< 0.04 U1
4/12/2022	Assessment	0.04 J1	1.48	316	< 0.007 U1	< 0.004 U1	< 0.04 U1	0.460	2.01	0.17	0.40	0.0160	< 0.2 U1	3.3	0.26 J1	< 0.04 U1
10/4/2022	Assessment	< 0.02 U1	1.68	261	< 0.007 U1	< 0.004 U1	0.16 J1	0.467	2.27	0.20	0.22	0.020	< 0.2 U1	3.8	0.34 J1	< 0.04 U1
2/15/2023	Assessment	0.02 J1	1.42	261	< 0.007 U1	< 0.004 U1	0.15 J1	0.341	1.52	0.19	0.25	0.0144	< 0.2 U1	2.6	0.28 J1	< 0.04 U1
4/5/2023	Assessment	< 0.04 U1	1.3	327	< 0.04 U1	< 0.02 U1	< 0.4 U1	0.27	1.58	0.17	0.3 J1	0.018	< 0.2 U1	2.2 J1	0.4 J1	< 0.1 U1
10/12/2023	Assessment	< 0.04 U1	1.1	251	< 0.04 U1	< 0.02 U1	0.4 J1	0.28	1.20	0.18	< 0.3 U1	0.0185	< 0.2 U1	3.8	0.6 J1	< 0.1 U1

**Table 1. Groundwater Data Summary: MW-1913D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/23/2020	Assessment	0.727	56.8	21.9	0.18	9.9	132	326
11/10/2020	Assessment	0.816	55.6	15.2	0.33	11.0	131	295
2/17/2021	Assessment	0.791	51.5	14.1	0.38	11.0	137	315
4/15/2021	Assessment	0.714	43.1	16.3	0.31	10.7	127	290
10/14/2021	Assessment	0.747	49.1	12.9	0.34	10.8	131	300
2/24/2022	Assessment	0.698	49.1	13.6	0.31	11.0	143	310
4/15/2022	Assessment	0.681	50.3 M1, P3	13.1	0.29	10.3	146	300
10/6/2022	Assessment	0.668	47.9	13.7	0.31	10.5	135	290
2/16/2023	Assessment	0.692	49.4	12.4	0.34	10.5	141	280
4/6/2023	Assessment	0.666	50.6	13.1	0.28	10.6	138	300
10/12/2023	Assessment	0.607	46.4	12.1	0.32	10.4	133	290

Table 1. Groundwater Data Summary: MW-1913D

**Clinch River - Pond 1
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/23/2020	Assessment	0.22	10.8	50.6	< 0.02 U1	< 0.01 U1	0.253	0.280	0.931	0.18	0.2 J1	0.0597	< 0.2 U1	362	0.4	< 0.1 U1
11/10/2020	Assessment	0.29	9.69	45.9	< 0.02 U1	< 0.01 U1	0.09 J1	0.161	0.853	0.33	0.1 J1	0.139	< 0.2 U1	403	0.5	< 0.1 U1
2/17/2021	Assessment	0.31	9.16	47.1	< 0.02 U1	0.02 J1	0.2 J1	0.135	1.684	0.38	0.07 J1	0.154	< 0.2 U1	402	0.5	< 0.1 U1
4/15/2021	Assessment	0.24	9.86	43.2	< 0.007 U1	< 0.004 U1	0.06 J1	0.154	1.49	0.31	0.06 J1	0.115	< 0.2 U1	387	0.4 J1	< 0.04 U1
10/14/2021	Assessment	0.26	9.63	44.7	< 0.007 U1	< 0.004 U1	0.26	0.137	0.93	0.34	0.08 J1	0.152	< 0.2 U1	437	0.49 J1	< 0.04 U1
2/24/2022	Assessment	0.24	9.22	46.3	< 0.007 U1	0.015 J1	0.26	0.279	1.25	0.31	< 0.05 U1	0.157	< 0.2 U1	457	0.42 J1	< 0.04 U1
4/15/2022	Assessment	0.24	8.69	46.0	< 0.007 U1	< 0.004 U1	< 0.04 U1	0.125	1.58	0.29	0.06 J1	0.157 M1	< 0.2 U1	526 M1, P3	0.36 J1	< 0.04 U1
10/6/2022	Assessment	0.25	9.67	44.4	< 0.007 U1	0.005 J1	0.12 J1	0.128	0.40	0.31	0.05 J1	0.154	< 0.2 U1	485	0.41 J1	< 0.04 U1
2/16/2023	Assessment	0.25	8.49	47.9	< 0.007 U1	< 0.004 U1	0.06 J1	0.116	1.22	0.34	0.08 J1	0.175	< 0.2 U1	508	0.42 J1	< 0.04 U1
4/6/2023	Assessment	0.231	8.96	48.2	< 0.007 U1	< 0.004 U1	0.14 J1	0.117	0.30	0.28	0.05 J1	0.153	< 0.2 U1	479	0.43 J1	< 0.02 U1
10/12/2023	Assessment	0.218	7.65	43.5	< 0.007 U1	< 0.004 U1	0.20 J1	0.112	1.16	0.32	< 0.05 U1	0.163	< 0.2 U1	430	0.31 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-1913S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
4/22/2020	Assessment	0.059	59.6	32.5	0.1 J1	7.0	139	373
11/10/2020	Assessment	0.057	62.5	32.6	0.13	7.7	134	357
2/16/2021	Assessment	0.05 J1	52.8	32.3	0.17	7.9	135	370
4/15/2021	Assessment	0.058	59.3	33.7	0.19	7.6	132	375
10/14/2021	Assessment	0.071	54.6	30.3	0.17	8.0	132	350
2/24/2022	Assessment	0.067	56.7 M1, P3	31.4	0.13	8.2	135	360
4/15/2022	Assessment	0.079	60.4 M1, P3	21.7	0.09	7.4	96.8	260
10/6/2022	Assessment	0.083	55.8	31.4	0.11	7.6	129	370
2/16/2023	Assessment	0.084	57.1	29.3	0.12	7.7	124	340
4/6/2023	Assessment	0.088	57.7	29.5	0.11	7.6	119	340
10/12/2023	Assessment	0.089	52.9	26.2	0.13	7.7	124	330

Table 1. Groundwater Data Summary: MW-1913S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
4/22/2020	Assessment	0.07 J1	1.33	111	< 0.02 U1	< 0.01 U1	0.2 J1	29.7	2.94	0.1 J1	4.54	0.00221	< 0.2 U1	63.3	0.1 J1	0.1 J1
11/10/2020	Assessment	0.33	1.14	94.0	< 0.02 U1	< 0.01 U1	0.05 J1	32.9	2.934	0.13	5.36	0.00161	< 0.2 U1	57.5	0.03 J1	0.2 J1
2/16/2021	Assessment	0.04 J1	1.32	93.7	< 0.02 U1	< 0.01 U1	0.2 J1	31.8	7.833	0.17	3.87	0.00140	< 0.2 U1	58.2	0.08 J1	0.1 J1
4/15/2021	Assessment	0.29	0.93	95.5	< 0.007 U1	0.007 J1	< 0.04 U1	29.3	2.177	0.19	5.33	0.00135	< 0.2 U1	59.7	< 0.09 U1	0.2 J1
10/14/2021	Assessment	< 0.02 U1	0.89	90.2	< 0.007 U1	0.006 J1	0.25	27.5	2.25	0.17	5.71	0.00092	< 0.2 U1	72.3	< 0.09 U1	0.29
2/24/2022	Assessment	< 0.02 U1	1.01	97.2 M1	< 0.007 U1	0.008 J1	0.30	29.2 M1	4.00	0.13	5.15	0.00105	< 0.2 U1	71.8	< 0.09 U1	0.23
4/15/2022	Assessment	0.06 J1	1.01	91.7	< 0.1 U1	< 0.004 U1	0.07 J1	27.9	3.59	0.09	5.09	0.001 J1	< 0.2 U1	69.1	< 0.09 U1	0.34
10/6/2022	Assessment	< 0.02 U1	0.71	90.6	< 0.007 U1	0.006 J1	0.13 J1	26.3	1.52	0.11	6.40	0.00090	< 0.2 U1	76.7	0.11 J1	0.31
2/16/2023	Assessment	0.02 J1	0.88	93.3	< 0.007 U1	< 0.004 U1	0.05 J1	28.3	3.40	0.12	6.00	0.00086	< 0.2 U1	77.8	< 0.09 U1	0.35
4/6/2023	Assessment	0.025 J1	0.91	93.6	< 0.007 U1	< 0.004 U1	0.14 J1	25.6	1.58	0.11	5.44	0.00089	< 0.2 U1	76.5	0.07 J1	0.29
10/12/2023	Assessment	0.01 J1	0.46	86.3	< 0.007 U1	< 0.004 U1	0.20 J1	23.7	1.38	0.13	6.17	0.00079	< 0.2 U1	82.2	0.11 J1	0.32

**Table 1. Groundwater Data Summary: MW-2012D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
2/17/2021	Assessment	0.511	12.1	456	1.06	8.2	44.8	1,230
4/14/2021	Assessment	0.513	11.9	407	1.03	8.3	12.0	1,080
10/13/2021	Assessment	0.447	11.5	379	0.98	8.5	11.9	1,190
2/24/2022	Assessment	0.467	11.5	410	0.95	8.6	8.2	1,170
4/14/2022	Assessment	0.492	12.6	398	0.94	8.0	6.3	1,100
10/5/2022	Assessment	0.487	12.0 P3	428	0.89	7.9	2.7	1,160
2/15/2023	Assessment	0.445	12.0	432	0.93	8.0	2.0	1,180
4/5/2023	Assessment	0.491	12.1	415	0.91	8.3	1.6	1,150
10/11/2023	Assessment	0.449	11.5	446	0.89	8.2	1.3 J1	1,230

Table 1. Groundwater Data Summary: MW-2012D

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
2/17/2021	Assessment	0.2 J1	7.62	749	0.4 J1	< 0.05 U1	10.1	5.09	0.7405	1.06	17.7	0.245	< 0.2 U1	8 J1	0.3 J1	< 0.5 U1
4/14/2021	Assessment	0.08 J1	2.55	934	0.05 J1	< 0.004 U1	1.01	0.884	1.363	1.03	3.21	0.258	< 0.2 U1	2 J1	0.09 J1	< 0.04 U1
10/13/2021	Assessment	0.04 J1	1.55	604	0.01 J1	< 0.004 U1	0.68	0.298	2.77	0.98	1.14	0.172	< 0.2 U1	1	< 0.09 U1	< 0.04 U1
2/24/2022	Assessment	0.02 J1	1.25	1,060	0.009 J1	< 0.004 U1	0.39	0.136	1.42	0.95	0.57	0.276	< 0.2 U1	0.6	< 0.09 U1	< 0.04 U1
4/14/2022	Assessment	0.04 J1	1.16	974	< 0.007 U1	< 0.004 U1	0.18 J1	0.109	0.61	0.94	0.34	0.270	< 0.2 U1	0.6	< 0.09 U1	< 0.04 U1
10/5/2022	Assessment	0.04 J1	1.07	1,030 M1, P3	0.010 J1	< 0.004 U1	0.35	0.194	1.26	0.89	0.64	0.287 M1, P3	< 0.2 U1	0.4 J1	< 0.09 U1	< 0.04 U1
2/15/2023	Assessment	0.02 J1	0.85	1,150	0.008 J1	< 0.004 U1	0.40	0.125	1.33	0.93	0.46	0.248	< 0.2 U1	0.3 J1	< 0.09 U1	< 0.04 U1
4/5/2023	Assessment	0.023 J1	0.85	991	< 0.007 U1	< 0.004 U1	0.22 J1	0.124	1.63	0.91	0.43	0.254	< 0.2 U1	0.3 J1	< 0.04 U1	< 0.02 U1
10/11/2023	Assessment	0.018 J1	0.90	1,150	< 0.007 U1	< 0.004 U1	0.26 J1	0.066	1.53	0.89	0.25	0.288	< 0.2 U1	0.3 J1	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: MW-2012S
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
2/17/2021	Assessment	0.360	30.3	81.6	0.37	7.9	4.8	567
4/14/2021	Assessment	0.376	33.1	78.7	0.37	7.9	5.0	512
10/13/2021	Assessment	0.353	34.6	94.9	0.35	8.1	0.88	590
2/24/2022	Assessment	0.225	40.5	69.7	0.28	8.0	49.6	550
4/14/2022	Assessment	0.328	36.7	83.5	0.33	7.4	18.4	520
10/5/2022	Assessment	0.357	38.4	89.9	0.33	7.4	11.9	520
2/15/2023	Assessment	0.311	38.3	80.0	0.34	7.7	17.4	530
4/5/2023	Assessment	0.321	34.0	74.4	0.33	7.8	12.5	500
10/11/2023	Assessment	0.359	29.5	106	0.36	7.8	0.7 J1	580

Table 1. Groundwater Data Summary: MW-2012S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
2/17/2021	Assessment	0.17	2.03	1,960	< 0.02 U1	< 0.01 U1	0.2 J1	0.412	2.169	0.37	0.1 J1	0.134	< 0.2 U1	8.78	< 0.03 U1	< 0.1 U1
4/14/2021	Assessment	0.15	3.08	1,870	< 0.007 U1	< 0.004 U1	0.08 J1	0.561	1.029	0.37	< 0.05 U1	0.135	< 0.2 U1	6.12	< 0.09 U1	< 0.04 U1
10/13/2021	Assessment	0.09 J1	2.69	1,500	< 0.01 U1	< 0.004 U1	0.32	0.786	3.62	0.35	0.08 J1	0.101	< 0.2 U1	5.5	< 0.09 U1	< 0.04 U1
2/24/2022	Assessment	0.08 J1	12.6	1,250	0.019 J1	< 0.004 U1	0.28	1.41	1.33	0.28	0.19 J1	0.0677	< 0.2 U1	10.9	< 0.09 U1	< 0.04 U1
4/14/2022	Assessment	0.07 J1	6.67	1,680	0.023 J1	< 0.004 U1	0.21	0.978	1.25	0.33	0.21	0.128	< 0.2 U1	5.3	< 0.09 U1	< 0.04 U1
10/5/2022	Assessment	0.04 J1	5.56	1,660	0.007 J1	< 0.004 U1	0.71	0.676	0.87	0.33	0.14 J1	0.143	< 0.2 U1	5.9	< 0.09 U1	< 0.04 U1
2/15/2023	Assessment	0.04 J1	6.58	1,680	< 0.007 U1	< 0.004 U1	0.18 J1	0.613	1.93	0.34	0.06 J1	0.106	< 0.2 U1	6.2	< 0.09 U1	< 0.04 U1
4/5/2023	Assessment	0.039 J1	4.19	1,450	0.009 J1	< 0.004 U1	0.14 J1	0.347	1.82	0.33	0.12 J1	0.126	< 0.2 U1	3.8	< 0.04 U1	< 0.02 U1
10/11/2023	Assessment	0.021 J1	2.08	2,040	< 0.007 U1	< 0.004 U1	0.19 J1	0.149	1.67	0.36	< 0.05 U1	0.162	< 0.2 U1	1.1	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: W-2201D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/7/2022	Assessment	0.643	75.5	1,370	0.6	7.6	788	3,600
2/16/2023	Assessment	0.631	125	1,400	0.4	7.3	1,150	4,600
4/6/2023	Assessment	0.718	129	1,410	0.4	7.5	1,170	4,520
10/16/2023	Assessment	0.589	95.0	1,540	0.5	7.5	689	3,700

Table 1. Groundwater Data Summary: W-2201D

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/7/2022	Assessment	0.15	6.58	246	< 0.4 U1	< 0.004 U1	0.80	0.254	0.54	0.6	0.27	0.591	< 0.2 U1	1.6	0.39 J1	< 0.04 U1
2/16/2023	Assessment	0.18	9.51	26.3	< 0.007 U1	0.005 J1	0.33	0.132	1.20	0.4	0.31	0.517	< 0.2 U1	1.6	0.34 J1	< 0.04 U1
4/6/2023	Assessment	0.140	12.8	26.2	0.007 J1	< 0.004 U1	0.47	0.128	0.84	0.4	< 1 U1	0.531	< 0.2 U1	1.4	0.36 J1	< 0.2 U1
10/16/2023	Assessment	0.145	6.80	45.5	< 0.007 U1	< 0.004 U1	0.33	0.055	1.12	0.5	0.19 J1	0.593	< 0.2 U1	1	0.21 J1	< 0.02 U1

Table 1. Groundwater Data Summary: W-2201S

Geosyntec Consultants, Inc.

**Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/6/2022	Assessment	0.383	29.5	131	0.36	6.7	42.0	510
2/16/2023	Assessment	0.359	28.9	137	0.38	7.5	37.1	530
4/6/2023	Assessment	0.391	28.5	128	0.39	7.6	29.3	520
10/16/2023	Assessment	0.394	25.1	137	0.41	7.5	24.2	510

Table 1. Groundwater Data Summary: W-2201S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/6/2022	Assessment	0.12	4.03	465	< 0.007 U1	< 0.004 U1	0.13 J1	2.44	1.81	0.36	0.12 J1	0.120	< 0.2 U1	4.5	< 0.09 U1	< 0.04 U1
2/16/2023	Assessment	0.17	2.98	432	< 0.007 U1	0.01 J1	< 0.04 U1	1.24	1.36	0.38	0.18 J1	0.106	< 0.2 U1	6.3	< 0.09 U1	< 0.04 U1
4/6/2023	Assessment	0.045 J1	2.45	370	< 0.007 U1	< 0.004 U1	0.14 J1	1.33	1.15	0.39	0.12 J1	0.112	< 0.2 U1	4.5	< 0.04 U1	0.03 J1
10/16/2023	Assessment	0.026 J1	2.21	336	< 0.007 U1	< 0.004 U1	0.14 J1	0.881	0.83	0.41	0.15 J1	0.116	< 0.2 U1	4.4	< 0.04 U1	< 0.02 U1

**Table 1. Groundwater Data Summary: W-2202D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/6/2022	Assessment	--	--	--	--	7.1	--	--
2/17/2023	Assessment	0.672	34.4	241	0.36	7.2	873	2,740
10/16/2023	Assessment	0.736	53.5	296	0.34	7.2	1,180	3,600

**Table 1. Groundwater Data Summary: W-2202D
Clinch River - Pond 1
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
2/17/2023	Assessment	0.08 J1	12.0	65.7	0.010 J1	< 0.004 U1	0.71	7.11	--	0.36	0.92	0.398	1.9	47.4	0.58	< 0.04 U1
10/16/2023	Assessment	0.117	18.9	43.1	0.009 J1	0.01 J1	1.20	4.18	0.40	0.34	0.18 J1	0.622	< 0.2 U1	34.2	0.58	< 0.02 U1

Table 1. Groundwater Data Summary: W-2202S*Geosyntec Consultants, Inc.***Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/6/2022	Assessment	0.798	63.8	71.5	0.25	7.0	919	1,880
2/17/2023	Assessment	0.748	58.5	53.1	0.34	7.0	746	1,750 S7
4/6/2023	Assessment	0.772	55.8	49.7	0.34	7.0	689	1,700
10/16/2023	Assessment	0.738	41.5	16.9	0.17	7.1	480	1,420

Table 1. Groundwater Data Summary: W-2202S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/6/2022	Assessment	1.73	0.99	33.6	< 0.007 U1	0.019 J1	0.51	2.22	0.95	0.25	0.07 J1	0.257	< 0.2 U1	17.4	0.50	0.13 J1
2/17/2023	Assessment	1.86	0.75	33.2	< 0.007 U1	0.027	0.08 J1	3.39	1.25	0.34	< 0.05 U1	0.195	< 0.2 U1	22.8	0.42 J1	0.1 J1
4/6/2023	Assessment	1.88	0.63	32.6	< 0.04 U1	0.017 J1	0.16 J1	2.57	1.20	0.34	0.09 J1	0.247	< 0.2 U1	22.0	0.44 J1	0.07 J1
10/16/2023	Assessment	0.202	5.45	69.7	< 0.007 U1	< 0.004 U1	0.27 J1	6.83	1.58	0.17	0.16 J1	0.234	< 0.2 U1	22.5	0.23 J1	0.06 J1

**Table 1. Groundwater Data Summary: W-2203D
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/7/2022	Assessment	0.810	167	2,050	0.4 J1	7.1	1,620	6,580 S1, H2
2/16/2023	Assessment	0.57	130	2,270	0.4 J1	7.1	1,130	6,000 S7
4/6/2023	Assessment	0.62	143	2,380	0.3 J1	7.2	975	5,440
10/16/2023	Assessment	0.60	128	2,640	0.5 J1	7.2	618	5,740

Table 1. Groundwater Data Summary: W-2203D

**Clinch River - Pond 1
Appendix IV Constituents**

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/7/2022	Assessment	0.22	15.2	40.0	< 0.4 U1	< 0.004 U1	0.52	4.05	1.29	0.4 J1	0.24	0.847	< 0.2 U1	43.0	0.59	< 0.04 U1
2/16/2023	Assessment	< 0.1 U1	10.1	42.7	< 0.04 U1	< 0.02 U1	0.5 J1	0.74	1.39	0.4 J1	3.5	0.756	< 0.2 U1	10.6	< 0.5 U1	< 0.2 U1
4/6/2023	Assessment	0.06 J1	9.4	50.5	< 0.04 U1	< 0.02 U1	< 0.4 U1	0.51	0.31	0.3 J1	< 0.3 U1	0.845	< 0.2 U1	6.2	< 0.2 U1	< 0.1 U1
10/16/2023	Assessment	< 0.04 U1	7.0	65.3	< 0.04 U1	< 0.02 U1	0.7 J1	0.25	1.43	0.5 J1	< 0.3 U1	1.00	< 0.2 U1	2.6	< 0.2 U1	< 0.1 U1

Table 1. Groundwater Data Summary: W-2203S

Geosyntec Consultants, Inc.

**Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/7/2022	Assessment	0.793	36.7	169	0.98	7.7	721	1,870
2/16/2023	Assessment	0.601	26.7	153	1.06	7.8	499	760
4/6/2023	Assessment	0.631	25.8	146	1.06	7.9	419	1,240
10/16/2023	Assessment	0.612	20.8	138	1.07	7.9	325	1,240

Table 1. Groundwater Data Summary: W-2203S

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/7/2022	Assessment	0.11	13.9	39.3	< 0.4 U1	< 0.004 U1	0.13 J1	0.083	3.88	0.98	0.22	0.236	< 0.2 U1	16.9	0.41 J1	< 0.04 U1
2/16/2023	Assessment	0.09 J1	11.4	41.6	< 0.007 U1	< 0.004 U1	0.13 J1	0.038	1.44	1.06	0.07 J1	0.172	< 0.2 U1	12.5	0.24 J1	< 0.04 U1
4/6/2023	Assessment	0.055 J1	9.95	52.5	< 0.04 U1	< 0.004 U1	0.16 J1	0.043	0.64	1.06	0.09 J1	0.206	< 0.2 U1	10.2	0.16 J1	< 0.02 U1
10/16/2023	Assessment	0.105	7.11	55.8	< 0.007 U1	< 0.004 U1	0.18 J1	0.076	1.53	1.07	0.27	0.214	< 0.2 U1	7.2	0.12 J1	< 0.02 U1

**Table 1. Groundwater Data Summary: W-2204
Clinch River - Pond 1
Appendix III Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
10/3/2022	Assessment	0.050	116	15.2	0.14	6.4	211	870
2/13/2023	Assessment	0.038 J1	115	9.12	0.12	7.0	186	780
4/3/2023	Assessment	0.031 J1	95.2	4.91	0.13	6.5	95	610
10/9/2023	Assessment	0.032 J1	97.8	2.23	0.13	7.0	77	600

Table 1. Groundwater Data Summary: W-2204

Clinch River - Pond 1

Appendix IV Constituents

Collection Date	Monitoring Program	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Combined Radium	Fluoride	Lead	Lithium	Mercury	Molybdenum	Selenium	Thallium
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
10/3/2022	Assessment	0.05 J1	14.7	73.9	< 0.007 U1	< 0.004 U1	0.10 J1	2.34	1.00	0.14	0.06 J1	0.0153	< 0.2 U1	13.4	0.32 J1	< 0.04 U1
2/13/2023	Assessment	0.06 J1	8.50	79.6	< 0.007 U1	< 0.004 U1	0.22	4.13	1.83	0.12	0.06 J1	0.00908	< 0.2 U1	4.9	0.11 J1	< 0.04 U1
4/3/2023	Assessment	0.040 J1	9.08	65.6	< 0.007 U1	< 0.004 U1	0.16 J1	0.960	1.52	0.13	0.08 J1	0.0075	< 0.2 U1	2.6	0.08 J1	< 0.02 U1
10/9/2023	Assessment	0.065 J1	10.5	67.8	< 0.007 U1	< 0.004 U1	0.27 J1	1.43	1.49	0.13	0.24	0.00678	< 0.2 U1	2.7	0.04 J1	< 0.02 U1

**Table 1. Groundwater Data Summary
Clinch River - Pond 1**

Geosyntec Consultants, Inc.

Notes:

--: Not analyzed

<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag.

In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.

B1: Analyte detected in method blank (MB) at or above the method criteria.

H2: Sample analysis performed past holding time.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

In analytical data prior to 5/18/2021, J1 flags were reported as J in the analytical report.

L1: The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

mg/L: milligrams per liter

P1: The precision between duplicate results was above acceptance limits.

P2: The precision on the laboratory control sample duplicate (LCSD) was above acceptance limits.

P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.

pCi/L: picocuries per liter

R2: Radium-226 carrier recovery outside of acceptance limits.

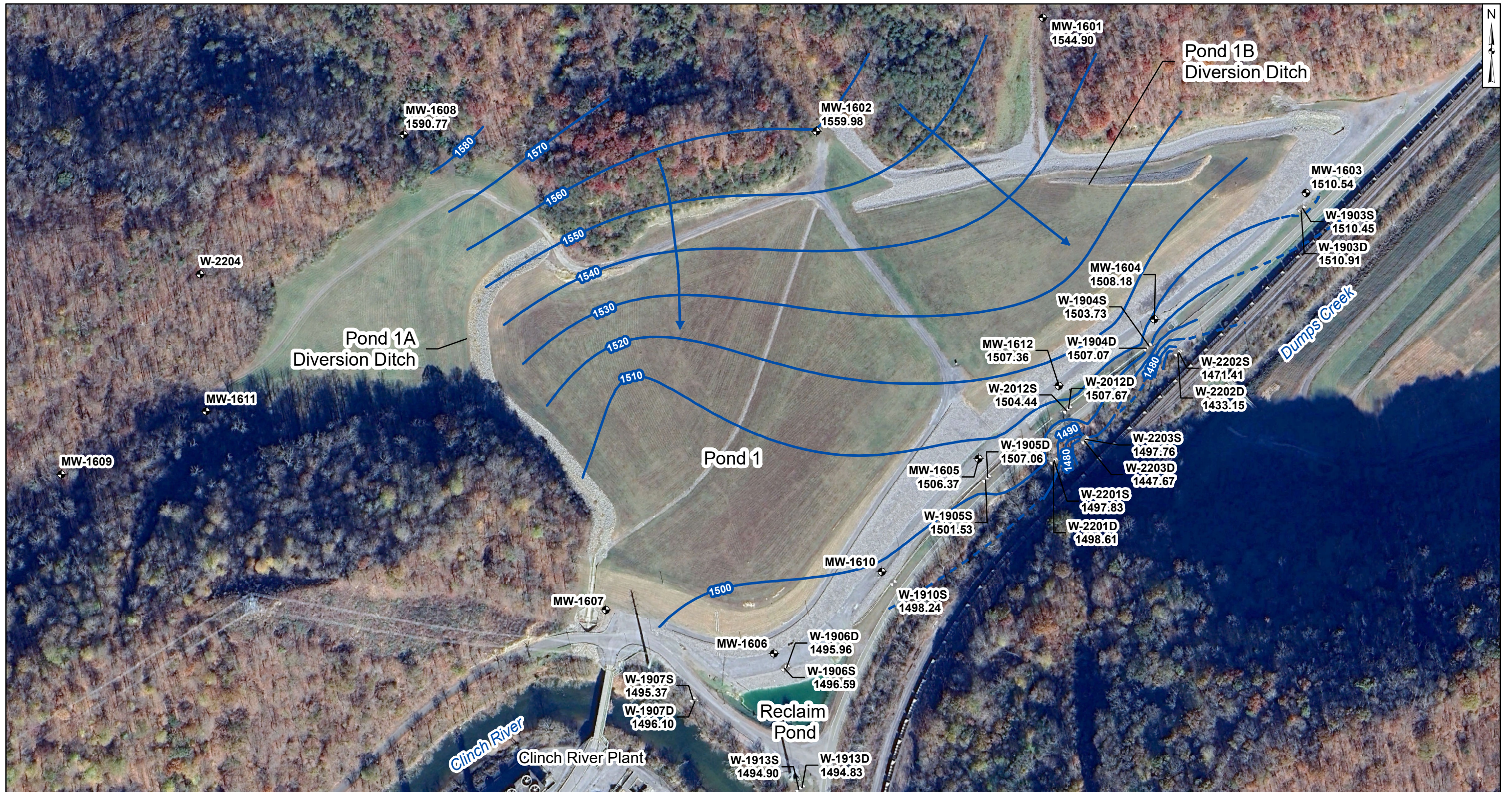
S1: Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

S7: Sample did not achieve constant weight.

SU: standard unit

µg/L: micrograms per liter

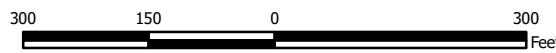
Groundwater Flow Direction Maps



- Legend**
- ◆ Groundwater Monitoring Well; Background
 - ◆ Nature and Extent Well
 - Groundwater Elevation Contour
 - Groundwater Flow Direction
 - - Groundwater Elevation Contour (Inferred)

Notes

- Monitoring well coordinates and water level data (collected on February 13, 2023) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec 2015) provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- Wells W-2201S, W-2201D, W-2201S, W-2202D, W-2203S, W-2203D, and W-2204 were installed in May and June 2022.
- Wells MW-1606 (1496.42 ft amsl), MW-1607 (1523.59 ft amsl), and MW-1609 (1660.01 ft amsl) were not included in the contouring as they were screened in the Rome Formation.
- Wells MW-1610 (1504.65 ft amsl), MW-1611 (1539.44 ft amsl) and W-2204 (1702.39 ft amsl) were not included in the contouring as they are screened across the Dumps Fault to monitor potential lateral migration of groundwater.
- Aerial basemap provided by Google Earth Pro.



**Potentiometric Surface Map - Uppermost Aquifer
February 2023**

AEP Clinch River Plant - Bottom Ash Pond
Carbo, Virginia



Ann Arbor, Michigan 2024/01/24

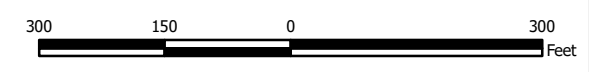
Figure
2



- Legend**
- ◆ Groundwater Monitoring Well; Background
 - ◆ Nature and Extent Well
 - Groundwater Elevation Contour
 - Groundwater Flow Direction
 - - Groundwater Elevation Contour (Inferred)

Notes

- Monitoring well coordinates and water level data (collected on March 30, 2023) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015) provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- Wells W-2201S, W-2201D, W-2201S, W-2202D, W-2203S, W-2203D, and W-2204 were installed in May and June 2022.
- Wells MW-1606 (1492.73 ft amsl), MW-1607 (1516.26 ft amsl), and MW-1609 (1659.70 ft amsl) were not included in the contouring as they were screened in the Rome Formation.
- Wells MW-1610 (1503.93 ft amsl), MW-1611 (1524.32 ft amsl) and W-2204 (1700.69 ft amsl) were not included in the contouring as they are screened across the Dumps Fault to monitor potential lateral migration of groundwater.
- Aerial basemap provided by Google Earth Pro.



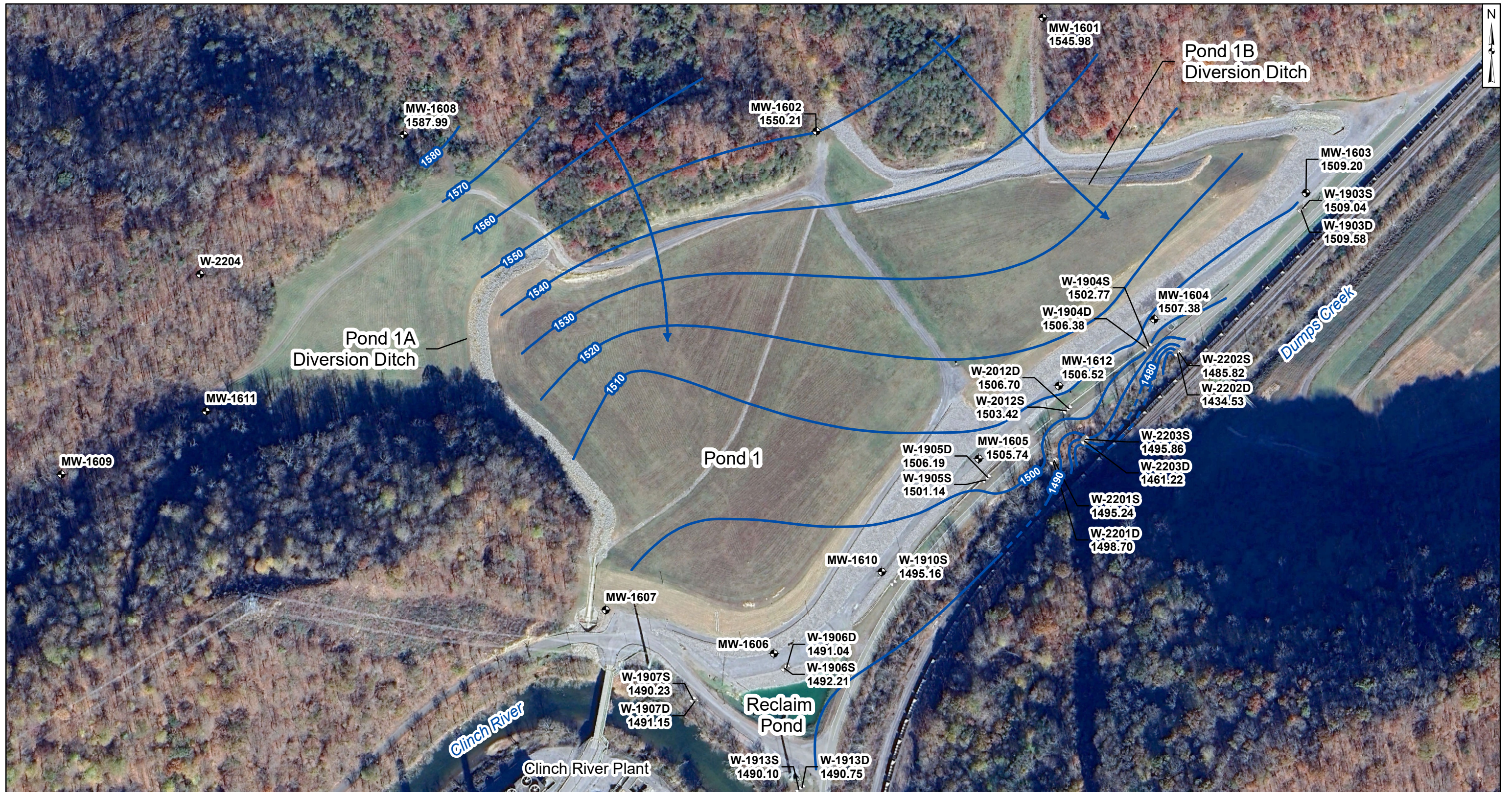
**Potentiometric Surface Map - Uppermost Aquifer
March 2023**

AEP Clinch River Plant - Bottom Ash Pond
Carbo, Virginia



Ann Arbor, Michigan 2024/01/24

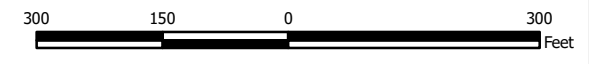
Figure
3



- Legend**
- ◆ Groundwater Monitoring Well; Background
 - ◆ Nature and Extent Well
 - Groundwater Elevation Contour
 - - Groundwater Elevation Contour (Inferred)
 - Groundwater Flow Direction

Notes

- Monitoring well coordinates and water level data (collected on October 6, 2023) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec 2015) provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- Wells W-2201S, W-2201D, W-2201S, W-2202D, W-2203S, W-2203D, and W-2204 were installed in May and June 2022.
- Wells MW-1606 (1491.51 ft amsl), MW-1607 (1502.38 ft amsl), and MW-1609 (1653.91 ft amsl) were not included in the contouring as they were screened in the Rome Formation.
- Wells MW-1610 (1503.01 ft amsl), MW-1611 (1543.75 ft amsl) and W-2204 (1695.88 ft amsl) were not included in the contouring as they are screened across the Dumps Fault to monitor potential lateral migration of groundwater.
- Aerial basemap provided by Google Earth Pro.



**Potentiometric Surface Map - Uppermost Aquifer
October 2023**

AEP Clinch River Plant - Bottom Ash Pond
Carbo, Virginia

Geosyntec
consultants

Figure

4

Ann Arbor, Michigan

2024/01/23

Groundwater Flow Velocity Calculations

**Table 1: Residence Time Calculation Summary
Clinch River Pond 1A/1B**

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2023-02		2023-04		2023-10	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Pond 1A/1B	MW-1601 ^[1]	2.0	137	0.4	160	0.4	137	0.4
	MW-1602 ^[1]	2.0	253	0.2	275	0.2	202	0.3
	MW-1603 ^[2]	2.0	192	0.3	161	0.4	218	0.3
	MW-1604 ^[2]	2.0	354	0.2	212	0.3	444	0.1
	MW-1605 ^[2]	2.0	279	0.2	207	0.3	224	0.3
	MW-1606 ^[2]	2.0	NC	NC	NC	NC	NC	NC
	MW-1607 ^[2]	2.0	NC	NC	NC	NC	NC	NC
	MW-1608 ^[1]	2.0	342	0.2	380	0.2	346	0.2
	MW-1609 ^[1]	2.0	NC	NC	NC	NC	NC	NC
	MW-1610 ^[2]	2.0	NC	NC	NC	NC	NC	NC
	MW-1611 ^[1]	2.0	NC	NC	NC	NC	NC	NC
	MW-1612 ^[2]	2.0	300	0.2	465	0.1	458	0.1

Notes:

[1] - Upgradient Well

[2] - Downgradient Well

NC - Not Calculated

Hydraulic conductivity was updated in 2021 to reflect current data

APPENDIX 2 – Statistical Analyses

The memorandums summarizing the statistical evaluation follow.

Memorandum

Date: January 24, 2024

To: Jill Parker-Witt (AEP)

Copies to: Brian Newton (AEP)

From: Allison Kreinberg (Geosyntec)

Subject: Evaluation of 2023 Reissued Analytical Laboratory Data for
Clinch River Plant

In accordance with Virginia Department of Environmental Quality (VADEQ) regulations regarding the solid waste facility management (9 Virginia Administrative Code [VAC] 20-81) groundwater sampling was completed in April 2023 at the Clinch River Plant in Cleveland, Virginia. Following submittal of the revised notification of groundwater protection standards evaluation,¹ select analytical laboratory reports were reissued to correct laboratory equipment data quality assurance/quality control issues.

A review of the reissued analytical laboratory reports identified reported lithium, mercury, and total dissolved solids (TDS) results that had changed (Table 1). The revised lithium, mercury, and TDS values in the reissued laboratory analytical reports will be used in future reporting and statistical evaluations.

¹ AEP. 2023. *Revised Notification of Groundwater Protection Standard Exceedances. Clinch River Pond 1, Permit No. 620*. American Electric Power. July 11.

**Table 1. 2023 Revised Analytical Results
Clinch River Plant**

Geosyntec Consultants, Inc.

Sample Date	Well ID	Well Location	Analyte	Units	Initial Reported Value	Revised Value
4/6/2023	MW-1907S	Nature and Extent	Mercury	µg/L	1.5	15
4/6/2023	MW-1907S	Nature and Extent	Lithium	mg/L	0.007	0.00695
4/6/2023	MW-1907D	Nature and Extent	Lithium	mg/L	0.0039	0.00392
4/6/2023	MW-1913S	Nature and Extent	Lithium	mg/L	0.0009	0.00089
4/6/2023	W-2201D	Nature and Extent	TDS	mg/L	4,500	4,520
4/6/2023	W-2203S	Nature and Extent	TDS	mg/L	1,200	1,240
4/6/2023	W-2203D	Nature and Extent	TDS	mg/L	5,400	5,440

Notes:

mg/L: milligrams per liter

µg/L: micrograms per liter



engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY, ASH POND 1

Clinch River Plant Carbo, Virginia

Prepared for

American Electric Power

1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

Geosyntec Consultants, Inc.
500 West Wilson Bridge Road, Suite 250
Worthington, Ohio 43085

Project Number: CHA8500B

March 28, 2023

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Table 4:	Appendix III Data Summary

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Attachment A:	Certification by Qualified Professional Engineer
Attachment B:	Statistical Analysis Output

ACRONYMS AND ABBREVIATIONS

CCR	coal combustion residuals
CFR	Code of Federal Regulations
GWPS	groundwater protection standards
LCL	lower confidence limit
LPL	lower prediction limit
mg/L	milligram per liter
PQL	practical quantitation limit
QA/QC	quality assurance/quality control
SSI	statistically significant increase
SSL	statistically significant level
SU	standard units
TDS	total dissolved solids
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (Code of Federal Regulations [CFR] Title 40, Section 257, Subpart D), groundwater monitoring has been conducted at Ash Pond 1 at the Clinch River Plant in Carbo, Virginia. The Clinch River Ash Pond 1 is an existing CCR unit. Recent groundwater monitoring results were compared to site-specific groundwater protection standards (GWPSs) to identify potential exceedances.

Eight monitoring events were completed from December 2017 to December 2018 to establish background concentrations for Appendix III and Appendix IV parameters under the CCR rule. Data collected through April 2019 were compared to the background concentrations to evaluate whether statistically significant increases (SSIs) or statistically significant levels (SSLs) of Appendix III or Appendix IV constituents, respectively, were identified (Geosyntec 2019). An alternative source was not identified, so Ash Pond 1 initiated an assessment of corrective measures in accordance with 40 CFR 257.96 and has since been completing assessment monitoring. An annual sampling event for Appendix IV parameters required by 257.95(b) was completed in February 2022, and semiannual sampling events for Appendix III and the detected Appendix IV parameters required by 257.95(d)(1) were completed in April and October 2022. During the February and April 2022 assessment monitoring events, SSLs were observed for barium, cobalt, lithium, and molybdenum (Geosyntec 2022a). The results of the October assessment monitoring event are documented in this report.

Monitoring data from the October 2022 event underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified that would impact data usability.

Groundwater data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. The statistics were completed in three separate groups, which correspond to differences in the underlying geology at the monitoring locations. GPWSs were reestablished for the Appendix IV parameters to assess whether Appendix IV parameters were present at an SSL above the GWPS. During the October 2022 event, SSLs were identified for barium, cobalt, lithium, and molybdenum. Therefore, the unit will continue the assessment of corrective measures process and will monitor the groundwater monitoring network in accordance with the assessment monitoring program as required by 40 CFR 275.96(b). Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

2. ASH POND 1 EVALUATION

2.1 Data Validation and QA/QC

During the October 2022 assessment monitoring event, one set of samples was collected for analysis from each background and compliance well throughout three geologically distinct monitoring well networks to meet the requirements of 40 CFR 257.95(d)(1). The geological units are the Chattanooga Shale, the Rome Limestone, and the Dumps Fault water-bearing unit. Samples from October 2022 were analyzed for all Appendix III and Appendix IV parameters. A summary of data collected during this assessment monitoring event may be found in Table 1.

Chemical analysis was completed by an analytical laboratory certified by the National Environmental Laboratory Accreditation Program. Quality assurance and quality control (QA/QC) samples completed by the analytical laboratory included the use of laboratory reagent blanks, continuing calibration verification samples, and laboratory-fortified blanks.

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location information and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.36 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

2.2 Statistical Analysis

Statistical analyses for Ash Pond 1 were conducted in accordance with the October 2020 Statistical Analysis Plan (Geosyntec 2020). Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in October 2022 were screened for potential outliers. No outliers were identified for this event.

2.2.1 Establishment of GWPSs

A GWPS was established for each Appendix IV parameter in accordance with 40 CFR 257.95(h) and the Statistical Analysis Plan (Geosyntec 2020). The established GWPS was set to whichever was greater of (1) the background concentration and (2) the maximum contaminant level or the level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit was calculated using data that were pooled from the background wells and collected during the background monitoring and assessment monitoring events. Generally, tolerance limits were calculated parametrically with 95% coverage and 95% confidence. Nonparametric tolerance limits were calculated in instances where data have either nonnormal distributions or a high nondetect frequency. Nonparametric tolerance limits for Chattanooga Shale wells were calculated for arsenic, barium, fluoride, lithium, molybdenum, and selenium due to apparent nonnormal distributions, and for beryllium, cadmium, mercury, and thallium due to a high nondetect frequency. Nonparametric tolerance limits for Rome Limestone wells were calculated for arsenic, cadmium, lithium, and molybdenum due to apparent nonnormal distributions, and for beryllium, mercury, and thallium due to a high nondetect frequency.

Nonparametric tolerance limits for Dumps Fault wells were calculated for arsenic, lead, lithium, and selenium due to apparent nonnormal distributions, and for beryllium, cadmium, mercury, and thallium due to a high nondetect frequency. Upper tolerance limits and the final GWPSs are summarized in Tables 2A-2C.

2.2.2 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$), but nonparametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the nondetect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) was above the GWPS (i.e., if the entire confidence interval was above the GWPS). Calculated confidence limits are shown in Attachment B.

The following SSLs were identified at Clinch River Ash Pond 1:

- Chattanooga Shale formation
 - LCLs for barium at MW-1603 (2.17 milligrams per liter [mg/L]), MW-1604 (3.10 mg/L), and MW-1612 (2.05 mg/L) were above the GWPS of 2.00 mg/L
 - LCL for lithium at MW-1605 (0.189 mg/L) was above the GWPS of 0.118 mg/L
- Rome Limestone formation
 - LCL for cobalt at MW-1607 (0.00836 mg/L) was above the GWPS of 0.00600 mg/L
 - LCLs for lithium at MW-1606 (0.0598 mg/L) and MW-1607 (0.119 mg/L) were above the GWPS of 0.0400 mg/L
 - LCL for molybdenum at MW-1607 (0.131 mg/L) was above the GWPS of 0.100 mg/L
- Dumps Fault water-bearing unit¹
 - LCL for lithium at MW-1610 (0.164 mg/L) was above the GWPS of 0.161 mg/L
 - LCL for molybdenum at MW-1610 (0.122 mg/L) was above the GWPS of 0.100 mg/L in the Dumps Fault water bearing unit
- While the LCL for cobalt at MW-1610 (0.00633 mg/L) was above the GWPS of 0.00600 mg/L when using the entire dataset, a statistically significant decreasing trend was observed. Thus, the confidence interval for cobalt at MW-1610 was generated using only the most recent eight data points to better represent present day groundwater

¹ While the LCL for cobalt at MW-1610 (0.00633 mg/L) was above the GWPS of 0.00600 mg/L when using the entire dataset, a statistically significant decreasing trend was observed. Thus, the confidence interval for cobalt at MW-1610 was generated using only the most recent eight data points to better represent present day groundwater quality. The LCL for cobalt at MW-1610 using only the eight most recent data points was 0.00448 mg/L and an SSL was not identified.

quality. The LCL for cobalt at MW-1610 using only the eight most recent data points was 0.00448 mg/L and an SSL was not identified.

These results are summarized in Table 3. As a result, Clinch River Ash Pond 1 will continue the assessment of corrective measures and continue to monitor the groundwater monitoring network in accordance with the assessment monitoring program per 40 CFR 257.96(b).

2.2.3 Establishment of Appendix III Prediction Limits

Upper prediction limits (UPL) were previously established for all Appendix III parameters following the background monitoring period (Geosyntec 2019). As described in the February 2022 Statistical Analysis Summary report (Geosyntec 2022b):

- In the Chattanooga Shale formation, intrawell tests were used to evaluate potential SSIs for boron, fluoride, sulfate, and total dissolved solids (TDS), and interwell tests were used for calcium, chloride, and pH.
- In the Rome Limestone formation, intrawell tests were used to evaluate potential SSIs for boron, calcium, fluoride, pH, and TDS, and interwell tests were used for chloride and sulfate.
- In the Dumps Fault water-bearing unit, intrawell tests were used to evaluate potential SSIs for all Appendix III parameters.

Interwell and intrawell prediction limits are updated periodically during the assessment monitoring period as sufficient data become available.

Mann-Whitney tests (Wilcoxon rank-sum tests) were performed to determine whether the newer data are affected by a release from Ash Pond 1. Because the interwell Appendix III limits and the Appendix IV GWPSs are based on data from upgradient wells, which were not expected to have been impacted by a release, these tests were used for intrawell Appendix III tests only. Mann-Whitney tests were used to compare the medians of historical data (December 2017–April 2020) with the more recent compliance samples (May 2020–April 2022). Results were evaluated to determine whether the medians of the two groups were similar at the 99% confidence level. Where no significant difference was found, the new compliance data were added to the background data set. Where a statistically significant difference was found between the medians of the two groups, the data were reviewed to evaluate the cause of the difference and to determine whether adding newer data to the background data set, replacing the background data set with the newer data, or continuing to use the existing background data set was most appropriate. If the differences appeared to have been caused by a release, then the previous background data set would have been used as before.

The complete Mann-Whitney test results and a summary of the significant findings can be found in Attachment B. In the Chattanooga Shale formation, statistically significant differences were found between the two groups for fluoride, sulfate, and TDS at select wells. In the Rome Limestone formation, a statistically significant difference was found between the two groups for calcium at MW-1607. In the Dumps Fault formation, statistically significant differences were found between the two groups for calcium, chloride, sulfate, and TDS at select wells.

Typically, when the test concludes that the medians of the two groups are significantly different, particularly in the downgradient wells, the background is not updated to include the newer data but will be reconsidered in the future. In the Chattanooga Shale formation, fluoride concentrations at MW-1604 were below concentrations in upgradient wells. Therefore, the background data set was updated to include all available fluoride data through April 2022. Downgradient wells MW-1603, MW-1604, and MW-1605 used a truncated portion of their records for sulfate, and downgradient well MW-1605 used a truncated portion of their records for TDS. The background data set for the remaining well-constituent pairs in the Chattanooga Shale formation were updated using all available data through April 2022. For the cases of calcium in the Rome Limestone formation and for calcium and TDS in the Dumps Fault formation, compliance data were lower concentrations than background data. Therefore, the background data sets were updated to include all available data for these well-constituent pairs through April 2022. In the Dumps Fault formation, upgradient well MW-1611 used a truncated portion of their records for calcium, chloride, sulfate, and TDS. Additionally, recent concentrations of sulfate at well MW-1612 were substantially lower than background concentrations. Therefore, the background data set was truncated to use more recent values to represent present-day water quality conditions.

Prediction limits for the interwell tests were recalculated using data collected during the 2022 assessment monitoring events. The Sen's Slope/Mann-Kendall trend test was used to evaluate data at upgradient wells in the Chattanooga Shale and Rome Limestones formations for analytes where interwell tests were used. Statistically significant increasing trends were found for calcium at MW-1602 in Chattanooga Shale. Decreasing trends were found for calcium and chloride at MW-1608 in Chattanooga Shale, and for chloride at MW-1601 in Chattanooga Shale and MW-1609 in Rome Limestone. However, the magnitudes of the trends were low compared to the average concentrations. Therefore, no adjustments were made to the background data sets. The complete results of the interwell Sen's Slope/Mann Kendall trend test are included in Attachment B. The updated prediction limits were calculated using a one-of-two retesting procedure, as during detection monitoring.

After the revised background set was established, a parametric or nonparametric analysis was selected based on the distribution of the data and the frequency of nondetect data. Estimated results under the reporting limit (i.e., practical quantitation limit [PQL]) but above the method detection limit—that is, “J-flagged” data—were considered detections and the estimated results were used in the statistical analyses. Nonparametric analyses were selected for data sets with at least 50% nondetect data or data sets that could not be normalized. Parametric analyses were selected for data sets (either transformed or untransformed) that passed the Shapiro-Wilk/Shapiro-Francia test for normality. The Kaplan-Meier nondetect adjustment was applied to data sets with between 15% and 50% nondetect data. For data sets with fewer than 15% nondetect data, nondetect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or nonparametric) and transformation (where applicable) for each background data set are shown in Attachment B.

Both interwell and intrawell UPLs were calculated for a one-of-two retesting procedure: If at least one sample in a series of two is not above the UPL (or, in the case of pH, is neither less than the lower prediction limits [LPLs] nor greater than the UPL), then it can be concluded that an SSI has not occurred. In practice, where the initial result is not above the UPL (or, in the case of pH, is neither less than the LPL nor greater than the UPL), a second sample will not be collected. The

retesting procedures allowed for an acceptably high statistical power that could detect changes at downgradient wells for constituents evaluated using intrawell prediction limits.

2.2.4 Evaluation of Potential Appendix III SSIs

While SSLs for Appendix IV parameters were identified, a review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Prediction limits were calculated for the Appendix III parameters to represent background values.

Data collected during the October 2022 assessment monitoring event from downgradient compliance wells were compared to revised prediction limits to evaluate results above background values. The results from this event and the prediction limits are summarized in Tables 4A-4C. The following SSIs above the UPLs were noted:

- Calcium concentrations were detected above the Chattanooga Shale interwell UPL of 7.21 mg/L at MW-1603 (28.6 mg/L), MW-1604 (25.9 mg/L), MW-1605 (46.6 mg/L), and MW-1612 (45.9 mg/L).
- Chloride concentrations were detected above the Chattanooga Shale interwell UPL of 45.8 mg/L at MW-1603 (122 mg/L) and MW-1605 (159 mg/L).
- Chloride concentrations were detected above the Rome Limestone interwell UPL of 4.10 mg/L at MW-1606 (13.8 mg/L) and MW-1607 (6.76 mg/L).
- Sulfate concentrations were detected above the Rome Limestone interwell UPL of 20.8 mg/L at MW-1606 (56.6 mg/L) and MW-1607 (139 mg/L).

Additionally, the following statistically significant decreases below the LPL for pH were noted:

- pH values were below the Chattanooga Shale interwell LPL of 7.3 standard units (SU) for MW-1603 (7.0 SU), MW-1604 (6.9 SU), and MW-1612 (6.7 SU).
- pH values were below the Dumps Fault intrawell LPL of 7.1 SU for MW-1610 (7.0 SU).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the initial (October 2022) sample was above the UPL or below the LPL.

2.3 Conclusions

A semiannual assessment monitoring event was conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. GWPSs were reestablished for the Appendix IV parameters. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval was above the GWPS. SSLs were identified for barium, cobalt, lithium, and molybdenum.

Appendix III parameters were compared to recalculated prediction limits. Calcium, chloride, and sulfate results were above background levels, and pH results were lower than background levels.

Based on this evaluation, the Clinch River Ash Pond 1 CCR unit will continue with the assessment of corrective measures and continue to monitor the groundwater monitoring network in accordance with the assessment monitoring program per 40 CFR 257.96b.

3. REFERENCES

Geosyntec. 2019. Statistical Analysis Summary – Ash Pond 1, Clinch River Plant, Carbo, Virginia. Geosyntec Consultants, Inc. July.

Geosyntec. 2020. Statistical Analysis Plan. Clinch River Plant, Carbo, Virginia. Geosyntec Consultants, Inc. October.

Geosyntec. 2022a. Statistical Analysis Summary – Ash Pond 1, Clinch River Plant, Carbo, Virginia. Geosyntec Consultants, Inc. August.

Geosyntec. 2022b. Statistical Analysis Summary – Ash Pond 1, Clinch River Plant, Carbo, Virginia. Geosyntec Consultants, Inc. February.

TABLES

**Table 1. Groundwater Data Summary
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Parameter	Unit	MW-1601	MW-1602	MW-1603	MW-1604	MW-1605	MW-1606	MW-1607	MW-1608	MW-1609	MW-1610	MW-1611	MW-1612
		10/3/2022	10/3/2022	10/5/2022	10/5/2022	10/4/2022	10/4/2022	10/4/2022	10/3/2022	10/3/2022	10/4/2022	10/3/2022	10/5/2022
Antimony	µg/L	0.02 J1	0.13	0.05 J1	0.03 J1	0.03 J1	0.1 U1	0.02 J1	0.02 J1	0.02 J1	0.21	0.1 U1	0.1 U1
Arsenic	µg/L	6.01	1.81	2.96	3.72	1.28	7.25	1.50	1.21	0.14	1.07	5.91	0.33
Barium	µg/L	175	98.7	2,980	3,160	2,360	112	67.9	27.0	385	299	245	2,390 M1, P3
Beryllium	µg/L	0.05 U1	0.5 U1	0.007 J1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.5 U1	0.05 U1
Boron	mg/L	0.591	0.632	0.269	0.452	0.570	0.163	0.123	0.392	0.014 J1	0.032 J1	0.552	0.407
Cadmium	µg/L	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.007 J1	0.058	0.004 J1	0.007 J1	0.031	0.02 U1	0.02 U1
Calcium	mg/L	6.96	4.66	28.6	25.9	46.6	60.4	43.9 M1, P3	0.65	79.0	35.2	33.8	45.9 M1, P3
Chloride	mg/L	21.1	4.94	122	17.3	159	13.8	6.76	5.24	1.13	9.84	12.9	20.8
Chromium	µg/L	0.10 J1	0.11 J1	0.52	1.71	0.13 J1	0.32	0.29	0.18 J1	0.2 U1	0.20	0.27	0.39
Cobalt	µg/L	0.066	0.019 J1	0.219	0.160	0.035	4.47	9.31	0.144	0.433	5.87	0.015 J1	0.096
Combined Radium	pCi/L	1.19	0.56	1.83	1.28	3.33	2.43	1.12	1.73	3.34	1.8	1.32	3.01
Fluoride	mg/L	2.31	1.70	0.11	0.30	0.30	0.20	0.20	0.40	0.24	0.19	1.13	0.16
Lead	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.53	0.37	0.11 J1	0.23	1.17	0.2 U1	0.2 U1
Lithium	mg/L	0.0964	0.0395	0.080	0.088	0.208	0.091	0.133	0.0188	0.00092	0.171	0.0656	0.147
Mercury	µg/L	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1
Molybdenum	µg/L	1.0	0.9	0.4 J1	0.3 J1	0.2 J1	60.3	132	1	0.3 J1	110	1.6	0.1 J1
Selenium	µg/L	0.5 U1	0.5 U1	0.11 J1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.14 J1	0.5 U1	0.5 U1
Sulfate	mg/L	231	25.1	0.46	0.4 U1	0.4 U1	56.6	139	165	11.8	17.7	33.3	0.4 U1
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	1,610	510	520	410	650	360	280	450	270	230	520	510
pH	SU	8.18	7.25	6.97	6.87	7.6	6.85	7.67	7.47	6.99	7.01	7.43	6.7

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Not detected at or above method detection limit (MDL). For statistical analysis, parameters that were not detected were replaced with the reporting limit.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.

S1: Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

H2: Sample analysis performed past holding time.

**Table 1. Groundwater Data Summary
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Parameter	Unit	MW-1903D	MW-1903S	MW-1904D	MW-1904S	MW-1905D	MW-1905S	MW-1906D	MW-1906S	MW-1907D	MW-1907S	MW-1910S	MW-1913D
		10/5/2022	10/5/2022	10/5/2022	10/5/2022	10/6/2022	10/6/2022	10/4/2022	10/4/2022	10/6/2022	10/6/2022	10/4/2022	10/6/2022
Antimony	µg/L	2.7	0.07 J1	0.25	0.08 J1	0.5 U1	0.5 U1	0.06 J1	0.14	0.05 J1	0.03 J1	0.1 U1	0.25
Arsenic	µg/L	7.5	0.97	1.76	2.88	2.3	2.3	3.08	5.90	1.15	0.50	1.68	9.67
Barium	µg/L	9,820	8,430	949	1,300	9,040	5,440 M1, P3	36.6	52.7	33.7	51.7	261	44.4
Beryllium	µg/L	1 U1	0.010 J1	0.05 U1	0.011 J1	0.25 U1	0.25 U1	0.05 U1	0.05 U1	0.008 J1	0.05 U1	0.05 U1	0.05 U1
Boron	mg/L	0.4 J1	0.407	0.560	0.436	0.64	0.58	0.022 J1	0.410	0.009 J1	0.01 J1	0.073	0.668
Cadmium	µg/L	0.4 U1	0.02 U1	0.02 U1	0.010 J1	0.1 U1	0.1 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.005 J1
Calcium	mg/L	139	91.7	8.60	19.5	193	249 M1, P3	29.7	48.6	51.0	67.4	20.8	47.9
Chloride	mg/L	3,410	1,040	97.0	10.7	3,640	1,870	14.2	13.5	3.45	12.2	16.4	13.7
Chromium	µg/L	3.1 J1	0.15 J1	0.15 J1	0.15 J1	0.2 J1	0.4 J1	0.16 J1	0.14 J1	0.16 J1	0.16 J1	0.16 J1	0.12 J1
Cobalt	µg/L	0.11 J1	0.099	0.117	0.162	0.03 J1	0.08 J1	0.783	0.318	0.207	9.23	0.467	0.128
Combined Radium	pCi/L	7.23	6.9	1.53	2.7	9.66	6.09	2.12	1.94	1.3	1.1	2.27	0.4
Fluoride	mg/L	0.5 J1	0.12 J1	1.06	0.23	0.4 J1	0.28	0.11	0.45	0.10	0.04 J1	0.20	0.31
Lead	µg/L	4 U1	0.08 J1	0.2 U1	0.2 U1	1 U1	1 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.22	0.05 J1
Lithium	mg/L	0.355	0.191	0.183	0.108	1.20	0.581 M1	0.015	0.170	0.00390	0.00664	0.020	0.154
Mercury	µg/L	1 U1	1 U1	1 U1	1 U1	2 U1	1 U1	1 U1	1 U1	1 U1	14.4	1 U1	1 U1
Molybdenum	µg/L	18	0.4 J1	4.9	1.6	4.7	5.1	8.8	374	1.6	0.7	3.8	485
Selenium	µg/L	10 U1	0.5 U1	0.5 U1	0.5 U1	2.5 U1	2.5 U1	0.5 U1	0.41 J1	0.5 U1	0.23 J1	0.34 J1	0.41 J1
Sulfate	mg/L	2.4 J1	1 U1	0.4 U1	0.4 U1	5 U1	1.4	92.9	131	32.2	15.2	0.95	135
Thallium	µg/L	1 U1	0.2 U1	0.2 U1	0.2 U1	1 U1	1 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	5,500	1,900	850	350	5,900	3,400	300	280	290	390	250	290
pH	SU	7.58	6.57	7.97	6.4	7.34	7.15	7.23	8.48	7.15	7.26	7.38	10.46

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Not detected at or above method detection limit (MDL). For statistical analysis, parameters that were not detected were replaced with the reporting limit.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.

S1: Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

H2: Sample analysis performed past holding time.

**Table 1. Groundwater Data Summary
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Parameter	Unit	MW-1913S	MW-2012D	MW-2012S	W-2201D	W-2201S	W-2202S	W-2203D	W-2203S	W-2204
		10/6/2022	10/5/2022	10/5/2022	10/7/2022	10/6/2022	10/6/2022	10/7/2022	10/7/2022	10/3/2022
Antimony	µg/L	0.1 U1	0.04 J1	0.04 J1	0.15	0.12	1.73	0.22	0.11	0.05 J1
Arsenic	µg/L	0.71	1.07	5.56	6.58	4.03	0.99	15.2	13.9	14.7
Barium	µg/L	90.6	1,030 M1, P3	1,660	246	465	33.6	40.0	39.3	73.9
Beryllium	µg/L	0.05 U1	0.010 J1	0.007 J1	2.5 U1	0.05 U1	0.05 U1	2.5 U1	2.5 U1	0.05 U1
Boron	mg/L	0.083	0.487	0.357	0.643	0.383	0.798	0.810	0.793	0.050
Cadmium	µg/L	0.006 J1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.019 J1	0.02 U1	0.02 U1	0.02 U1
Calcium	mg/L	55.8	12.0 P3	38.4	75.5	29.5	63.8	167	36.7	116
Chloride	mg/L	31.4	428	89.9	1,370	131	71.5	2,050	169	15.2
Chromium	µg/L	0.13 J1	0.35	0.71	0.80	0.13 J1	0.51	0.52	0.13 J1	0.10 J1
Cobalt	µg/L	26.3	0.194	0.676	0.254	2.44	2.22	4.05	0.083	2.34
Combined Radium	pCi/L	1.52	1.26	0.87	0.54	1.81	0.95	1.29	3.88	1
Fluoride	mg/L	0.11	0.89	0.33	0.6	0.36	0.25	0.4 J1	0.98	0.14
Lead	µg/L	6.40	0.64	0.14 J1	0.27	0.12 J1	0.07 J1	0.24	0.22	0.06 J1
Lithium	mg/L	0.00090	0.287 M1, P3	0.143	0.591	0.120	0.257	0.847	0.236	0.0153
Mercury	µg/L	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1
Molybdenum	µg/L	76.7	0.4 J1	5.9	1.6	4.5	17.4	43.0	16.9	13.4
Selenium	µg/L	0.11 J1	0.5 U1	0.5 U1	0.39 J1	0.5 U1	0.50	0.59	0.41 J1	0.32 J1
Sulfate	mg/L	129	2.7	11.9	788	42.0	919	1,620	721	211
Thallium	µg/L	0.31	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.13 J1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	370	1,160	520	3,600	510	1,880	6,580 S1, H2	1,870	870
pH	SU	7.57	7.85	7.37	7.61	6.7	6.96	7.11	7.66	6.39

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U1: Not detected at or above method detection limit (MDL). For statistical analysis, parameters that were not detected were replaced with the reporting limit.

J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.

P3: The precision on the matrix spike duplicate (MSD) was above acceptance limits.

S1: Residue weight is above or below the method criteria and needs to be re-analyzed at a different dilution.

H2: Sample analysis performed past holding time.

**Table 2A. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Chattanooga Shale Monitoring Well Network				
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000376	0.00600
Arsenic, Total (mg/L)	0.0100		0.0258	0.0258
Barium, Total (mg/L)	2.00		0.306	2.00
Beryllium, Total (mg/L)	0.00400		0.0000660	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000300	0.00500
Chromium, Total (mg/L)	0.0500		0.00112	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.000383	0.00600
Combined Radium, Total (pCi/L)	5.00		2.62	5.00
Fluoride, Total (mg/L)	4.00		2.42	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000493	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.118	0.118
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.0257	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

GWPS: Groundwater Protection Standard

MCL: Maximum Contaminant Level

CCR: Coal Combustion Residuals

mg/L: milligrams per liter

pCi/L: picocuries per liter

Calculated UTL (Upper Tolerance Limit) represents site-specific background values

Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.

**Table 2B. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Rome Limestone Monitoring Well Network				
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000105	0.00600
Arsenic, Total (mg/L)	0.0100		0.000970	0.0100
Barium, Total (mg/L)	2.00		0.512	2.00
Beryllium, Total (mg/L)	0.00400		0.0000500	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000400	0.00500
Chromium, Total (mg/L)	0.0500		0.000321	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.00125	0.00600
Combined Radium, Total (pCi/L)	5.00		5.00	5.00
Fluoride, Total (mg/L)	4.00		0.337	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00119	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0100	0.0400
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00222	0.100
Selenium, Total (mg/L)	0.0500		0.000391	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

GWPS: Groundwater Protection Standard

MCL: Maximum Contaminant Level

CCR: Coal Combustion Residuals

mg/L: milligrams per liter

pCi/L: picocuries per liter

Calculated UTL (Upper Tolerance Limit) represents site-specific background values

Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.

**Table 2C. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Dumps Fault Monitoring Well Network				
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000802	0.00600
Arsenic, Total (mg/L)	0.0100		0.0395	0.0395
Barium, Total (mg/L)	2.00		0.282	2.00
Beryllium, Total (mg/L)	0.00400		0.0000500	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000200	0.00500
Chromium, Total (mg/L)	0.0500		0.000923	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.000136	0.00600
Combined Radium, Total (pCi/L)	5.00		1.70	5.00
Fluoride, Total (mg/L)	4.00		1.38	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000200	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.161	0.161
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00552	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

GWPS: Groundwater Protection Standard

MCL: Maximum Contaminant Level

CCR: Coal Combustion Residuals

mg/L: milligrams per liter

pCi/L: picocuries per liter

Calculated UTL (Upper Tolerance Limit) represents site-specific background values

Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.

**Table 3. Appendix IV Identified Statistically Significant Levels
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Formation	Well ID	Constituent	GWPS	LCL
Chattanooga Shale	MW-1603	Barium	2.00	2.17
	MW-1604	Barium	2.00	3.10
	MW-1612	Barium	2.00	2.05
	MW-1605	Lithium	0.118	0.189
Rome Limestone	MW-1606	Lithium	0.0400	0.0598
	MW-1607	Cobalt	0.00600	0.00836
		Lithium	0.0400	0.119
		Molybdenum	0.100	0.131
Dumps Fault	MW-1610	Lithium	0.161	0.164
		Molybdenum	0.100	0.122

Notes:

All values are in milligrams per liter (mg/L)

GWPS: Groundwater protection standard

LCL: lower confidence limit

**Table 4A. Appendix III Data Summary
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Analyte	Unit	Description	Chattanooga Shale			
			MW-1603	MW-1604	MW-1605	MW-1612
			10/5/2022	10/5/2022	10/4/2022	10/5/2022
Boron	mg/L	Intrawell Background Value (UPL)	0.455	0.490	0.699	0.555
		Analytical Result	0.269	0.452	0.570	0.407
Calcium	mg/L	Interwell Background Value (UPL)	7.21			
		Analytical Result	28.6	25.9	46.6	45.9
Chloride	mg/L	Interwell Background Value (UPL)	45.8			
		Analytical Result	122	17.3	159	20.8
Fluoride	mg/L	Intrawell Background Value (UPL)	0.181	0.351	0.420	0.238
		Analytical Result	0.11	0.30	0.30	0.16
pH	SU	Interwell Background Value (UPL)	9.1			
		Interwell Background Value (LPL)	7.3			
		Analytical Result	7.0	6.9	7.6	6.7
Sulfate	mg/L	Intrawell Background Value (UPL)	3.11	1.67	11.2	1.40
		Analytical Result	0.46	0.06	0.06	0.06
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	785	427	732	560
		Analytical Result	520	410	650	510

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

mg/L: milligrams per liter

SU: standard unit

Background values exceed the background value.

Background values are shaded gray.

**Table 4B. Appendix III Data Summary
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Analyte	Unit	Description	Rome Limestone	
			MW-1606	MW-1607
			10/4/2022	10/4/2022
Boron	mg/L	Intrawell Background Value (UPL)	0.189	0.212
		Analytical Result	0.163	0.123
Calcium	mg/L	Intrawell Background Value (UPL)	64.0	52.2
		Analytical Result	60.4	43.9
Chloride	mg/L	Interwell Background Value (UPL)	4.10	
		Analytical Result	13.8	6.76
Fluoride	mg/L	Intrawell Background Value (UPL)	0.271	0.268
		Analytical Result	0.20	0.20
pH	SU	Intrawell Background Value (UPL)	7.4	8.3
		Intrawell Background Value (LPL)	6.7	7.2
		Analytical Result	6.9	7.7
Sulfate	mg/L	Interwell Background Value (UPL)	20.8	
		Analytical Result	56.6	139
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	377	313
		Analytical Result	360	280

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

mg/L: milligrams per liter

SU: standard unit

Bold values exceed the background value.

Background values are shaded gray.

**Table 4C. Appendix III Data Summary
Statistical Analysis Summary, Ash Pond 1
Clinch River Plant**

Analyte	Unit	Description	Dumps Fault
			MW-1610
			10/4/2022
Boron	mg/L	Intrawell Background Value (UPL)	0.102
		Analytical Result	0.032
Calcium	mg/L	Intrawell Background Value (UPL)	39.5
		Analytical Result	35.2
Chloride	mg/L	Intrawell Background Value (UPL)	12.2
		Analytical Result	9.84
Fluoride	mg/L	Intrawell Background Value (UPL)	0.350
		Analytical Result	0.19
pH	SU	Intrawell Background Value (UPL)	8.1
		Intrawell Background Value (LPL)	7.1
		Analytical Result	7.0
Sulfate	mg/L	Intrawell Background Value (UPL)	52.8
		Analytical Result	17.7
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	268
		Analytical Result	230

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

mg/L: milligrams per liter

SU: standard unit

Background values exceed the background value.

Background values are shaded gray.

ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

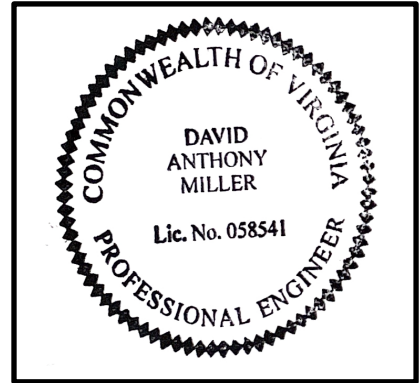
I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Clinch River Ash Pond 1 CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



058541

License Number

Virginia

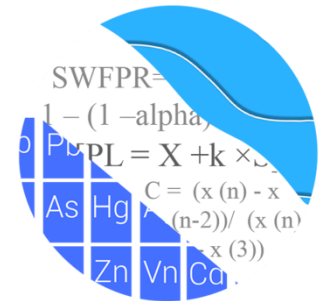
Licensing State

03.28.2023

Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING



January 30, 2023

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
500 W. Wilson Bridge Road, Ste. #250
Worthington, OH 43085

RE: Clinch River Pond 1 – Assessment Monitoring Report & Background Update – 2022

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical evaluation and background update of groundwater data for the October 2022 sample event at American Electric Power Company's Clinch River Pond 1. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the Clinch River Pond 1 for the Coal Combustion Residuals (CCR) program in 2017 at each of the groundwater monitoring wells. The monitoring well network, as provided by Geosyntec Consultants, consists of the following three formations:

Chattanooga Shale:

Upgradient Wells: MW-1601, MW-1602, MW-1608

Downgradient Wells: MW-1603, MW-1604, MW-1605, MW-1612

Rome Limestone:

Cross-gradient (background) Well: MW-1609

Downgradient Wells: MW-1606, MW-1607

Dumps Fault:

Upgradient Well: MW-1611

Downgradient Well: MW-1610

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was reviewed by Kristina Rayner, Founder and Senior Statistician for Groundwater Stats Consulting.

The CCR program consists of the following Assessment Monitoring constituents listed below. The terms "constituent" and "parameter" are interchangeable.

- **Appendix III** (Detection Monitoring) - boron, calcium, chloride, fluoride, pH, sulfate, and TDS
- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

For all constituents, a substitution of the most recent reporting limit is used for non-detect data. Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. A summary of well/constituent pairs with 100% non-detects follows this letter.

A separate section is provided for each formation and includes time series plots for Appendix III and IV parameters at all wells within the same formation, for the purpose of screening data (Figure A for each formation). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B for each formation). The time series plots are used to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between all wells.

Data at all wells were evaluated for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix III parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. Power curves were provided with the background update conducted in February 2021 and demonstrated that the selected statistical methods for Appendix III parameters comply with the USEPA Unified Guidance recommendations as discussed below.

Summary of Statistical Methods:

Based on the original background screening described in the 2017 screening report, the following statistical methods were used for analyzing Appendix III parameters:

Chattanooga Shale:

- 1) Interwell parametric prediction limits, combined with a 1-of-2 resample plan for calcium, chloride, and pH
- 2) Intrawell parametric prediction limits, combined with a 1-of-2 resample plan for boron, fluoride, sulfate, and TDS

Rome Limestone:

- 1) Interwell prediction limits, combined with a 1-of-2 resample plan for chloride and sulfate
- 2) Intrawell parametric prediction limits, combined with a 1-of-2 resample plan for boron, calcium, fluoride, pH, and TDS

Dumps Fault:

- 1) Intrawell parametric prediction limits, combined with a 1-of-2 resample plan, for boron, calcium, chloride, fluoride, pH, sulfate and TDS

Parametric prediction and tolerance limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (USEPA, 2009), data are analyzed using either parametric or non-parametric prediction and tolerance limits as appropriate. Non-detects are handled as follows:

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits are used on data containing greater than 50% non-detects.

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping a landfill, paving areas near a well, or lining a drainage channel to prevent erosion. Periodic updating of background statistical limits is necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents may be re-evaluated when a minimum of 4 new data points are available to determine whether earlier concentrations are representative of present-day groundwater quality. In the interwell case, prediction limits are updated with upgradient well data following each sampling event after careful screening for any new outliers. In some cases, deselecting the earlier portion of data may be necessary prior to construction of limits so that resulting statistical limits are conservative (i.e., lower) from a regulatory perspective and capable of rapidly detecting changes in groundwater quality. Even though the data are excluded from the calculation, the values will continue to be reported and shown in tables and graphs.

Summary of Original Background Screening – June 2019

Outlier Evaluation

Time series plots were used to identify suspected outliers, or extreme values that would result in limits that are not conservative from a regulatory perspective, in proposed background data. Suspected outliers at all wells for Appendix III and Appendix IV parameters were formally tested using Tukey's box plot method and, when identified, flagged in the computer database with "o" and deselected prior to construction of statistical limits.

Seasonality

No distinct seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made. When seasonal patterns are observed, data may be deseasonalized so that the resulting limits will correctly account for the seasonality as a predictable pattern rather than random variation or a release.

Trend Test Evaluation

While a trend may be visually apparent, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends. In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to

eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits. No adjustments were required at the time, and results of the trend tests were included with the 2019 screening.

Appendix III – Determination of Spatial Variation

The Analysis of Variance (ANOVA) is used when 2 or more upgradient wells are available to statistically evaluate whether there are significant differences in average concentrations among the wells, and assists in identifying the most appropriate statistical approach. Interwell tests, which compare downgradient well data to statistical limits constructed from pooled upgradient well data, are appropriate when average concentrations are similar across upgradient wells. Intrawell tests, which compare compliance data from a single well to screened historical data within the same well, are appropriate when upgradient wells exhibit spatial variation; when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameter.

The application of Analysis of Variance, upgradient tolerance limits, and downgradient confidence intervals for evaluation of these criteria is described in the 2019 screening study report and resulted in the recommended method for each Appendix III parameter at each respective formation.

Appendix III Background Update Summaries

February 2021

Prior to updating background data for the Fall 2020 analysis, Tukey's outlier test and visual screening were used to re-evaluate data for outliers at all wells for parameters utilizing intrawell prediction limits, and at all upgradient wells for parameters utilizing interwell prediction limits. For Chattanooga Shale, Tukey's outlier test identified a high value for TDS in well MW-1605, which was flagged accordingly. For Rome Limestone, Tukey's outlier test identified a high value for TDS in well MW-1607 that was flagged accordingly. Additionally, a similarly high value for TDS in well MW-1607 was identified visually and flagged as an outlier in order to generate statistical limits that were conservative (i.e.,

lower) from a regulatory perspective. For Dumps Fault, Tukey's outlier test did not identify any potential outliers, and no Appendix III values were flagged.

For parameters that require intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through December 2018 to the new compliance samples at each well through April 2020. The test evaluates whether the groups are statistically different at the 99% confidence level. Background limits for other well/constituent pairs with significant results from the Mann-Whitney test (sulfate at downgradient wells MW-1603, MW-1604, MW-1605, and MW-1612 at Chattanooga Shale, and calcium, chloride, sulfate, and TDS in well MW-1611, at Dumps Fault), will utilize, at a minimum, the most recent 8 measurements beginning from August 2018 through April 2020. The earlier portions of the records appeared to be substantially higher than the compliance concentrations and were deselected prior to construction of statistical limits. The resulting limits better represent present-day water quality conditions. All available background data through April 2020, except in cases mentioned above, were used to establish intrawell background limits.

For parameters tested using interwell analyses, the Sen's Slope/Mann-Kendall trend test was used on upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. Although statistically significant trends were identified for Chattanooga Shale and Rome Limestone, the magnitudes of the trends above are either fairly small relative to average concentrations within each well or would not greatly affect the interwell prediction limits. Therefore, all well/constituent pairs using interwell prediction limits were updated using data through October 2020.

January 2022

Upgradient well data through October 2021 were re-screened for the purpose of updating the interwell prediction limits at each of the formations. Intrawell prediction limits were not updated during the January 2022 background update due to insufficient compliance samples.

Outlier Analysis

Tukey's outlier test and visual screening were used to re-evaluate data at all upgradient wells for parameters utilizing interwell prediction limits. When the most recent value is identified as an outlier, values are often not flagged in the database at this time as they may represent the beginning of a trend. If future values do not remain at similar concentrations, these values will be flagged as outliers and deselected. Several low values exist in the data sets and appear on the graphs as possible low outliers relative to the

laboratory's Practical Quantitation Limit. However, these values are observed trace values (i.e., measurements reported by the laboratory between the Method Detection Limit and the Practical Quantitation Limit) and, therefore, were not flagged as outliers.

Any values flagged as outliers (o-flag) are plotted in a disconnected symbol and lighter font on the time series graph. A substitution of the most recent reporting limit was applied when varying detection limits existed in data.

Tukey's outlier analysis results for upgradient and downgradient wells and outlier summaries are included with this report in Figure C for each formation. Note that outlier analysis results are combined for Appendix III and Appendix IV constituents. Also note that for the tables of downgradient Tukey's results, the upgradient wells for the same parameters are included for comparison. Tukey's outlier test on pooled upgradient well data did not identify any potential outliers for any of the formations, and no values were flagged in upgradient wells for Appendix III parameters.

Intrawell Parameters—Prediction Limits

Note that since the previous background update conducted in February 2021, additional samples were provided by Geosyntec for the May 2019 sample event, and these samples were included in the construction of the intrawell limits during this analysis. All available background data through April 2020, except in cases mentioned above, were used to establish intrawell background limits, combined with a 1-of-2 resample plan, that will be used for future comparisons.

Interwell Parameters—Trend Testing

For parameters tested using interwell analyses, the Sen's Slope/Mann-Kendall trend test was used on upgradient wells to determine whether concentrations are statistically increasing, decreasing or stable. Statistically significant trends were identified for the following upgradient well/constituent pairs:

Increasing

Chattanooga Shale

- Calcium: MW-1602

Decreasing

Chattanooga Shale

- Chloride: MW-1601 and MW-1608

Rome Limestone

- Chloride: MW-1609

The magnitudes of the trends above are either low relative to average concentrations within each well or would not greatly affect the interwell prediction limits. With limited background samples collected to date, all data from upgradient wells were used to construct interwell prediction limits. As more data are collected, all upgradient well data will be re-evaluated for possible deselection of earlier measurements if they no longer represent present-day groundwater quality conditions.

Interwell Parameters—Prediction Limits

Interwell prediction limits using data through October 2021 for parameters mentioned above, combined with a 1-of-2 resample plan, were constructed from pooled upgradient well data for the Chattanooga Shale and Rome Limestone formations. Downgradient measurements will be compared to these background limits during each subsequent semi-annual sampling event.

January 2023

Upgradient well data through October 2022 were re-screened for the purpose of updating the interwell prediction limits at each of the formations. Intrawell prediction limits were updated through April 2022 during this background update because sufficient compliance samples were available.

Outlier Analysis

Prior to updating background data during this analysis, Tukey's outlier test and visual screening were used to re-evaluate data through April 2022 for outliers at all wells for parameters using intrawell prediction limits and through October 2022 for outliers at all upgradient wells for parameters utilizing interwell prediction limits. Several low values exist in the data sets and appear on the graphs as possible low outliers relative to the laboratory's Practical Quantitation Limit. However, these values are observed trace values (i.e., measurements reported by the laboratory between the Method Detection Limit and the Practical Quantitation Limit); therefore, they were not flagged as outliers.

Any values flagged as outliers (o-flag) are plotted in a disconnected symbol and lighter font on the time series graph. A substitution of the most recent reporting limit was applied when varying detection limits existed in data.

Tukey's outlier analysis results for upgradient and downgradient wells and outlier summaries are included with this report in Figure C for each formation. Note that outlier analysis results are combined for Appendix III constituents using interwell prediction limits and Appendix IV constituents. Also note that for the tables of Tukey's results for downgradient wells, the upgradient wells for the same parameters are included for comparison.

For parameters which use intrawell prediction limits, Tukey's outlier test on all wells confirmed previously flagged outliers for TDS at Chattanooga Shale and Rome Limestone. These values remain flagged as outliers. During this update, a low value of TDS at well MW-1612 was also flagged in order to reduce variation and construct a statistical limit that is more conservative (i.e., lower) from a regulatory perspective. Outliers were also identified for boron in upgradient well MW-1609 at Rome Limestone, but these values were not flagged as they were not drastically higher than the reporting limit of 0.04 mg/L.

Tukey's outlier test on pooled upgradient well data did not identify any outliers and no values were flagged in upgradient wells for Appendix III parameters using interwell prediction limits. Tukey's outlier test results are provided in Figure C. A list of flagged outliers follows this report.

Intrawell Parameters—Mann-Whitney Testing

For parameters that require intrawell prediction limits, the Mann-Whitney (Wilcoxon Rank Sum) test was used to compare the medians of historical data through April 2020 to the new compliance samples at each well through April 2022 (Figure D). The test evaluates whether the groups are statistically different at the 99% confidence level. If no statistically significant differences are noted, background data may be updated to include more recent data. Complete graphical results of the Mann-Whitney tests are included at the end of this report (Figure D for each of the three formations). Statistically significant differences were identified for the following well/constituent pairs at the following formations:

Chattanooga Shale

- Fluoride: MW-1604
- Sulfate: MW-1603, MW-1604, and MW-1605
- TDS: MW-1605

Rome Limestone

- Calcium: MW-1607

Dumps Fault

- Calcium: MW-1611 (upgradient) and MW-1610
- Chloride: MW-1611 (upgradient) and MW-1610
- Sulfate: MW-1611 (upgradient)
- TDS: MW-1611 (upgradient) and MW-1610

Typically, when the test concludes that the medians of the two groups are significantly different, particularly in the downgradient wells, the background data are not updated to include the newer data but will be reconsidered in the future. Even though a significant increase in median was identified for fluoride at well MW-1604, the concentrations are an order of magnitude lower than the MCL of 4 mg/L and are all lower than any concentrations found upgradient of the facility; therefore, this record was updated. Regarding other well/constituent pairs with significant differences, background data for calcium in downgradient well MW-1607 at Rome Limestone and for calcium and TDS in well MW-1610 at Dumps Fault were updated with more recent data. In these three cases, compliance data were at lower concentrations than original background data and should generally result in more conservative prediction limits when added to background.

Background limits for other well/constituent pairs with significant results from the Mann-Whitney test (sulfate at downgradient wells MW-1603, MW-1604, and MW-1605 and TDS at downgradient well MW-1605 at Chattanooga Shale, and calcium, chloride, sulfate, and TDS in well MW-1611, at Dumps Fault), will utilize at least the most recent 8 measurements from February 2020 through April 2022. Although not statistically significantly different at the 99% confidence level, more recent concentrations for sulfate at well MW-1612 have decreased by more than an order of magnitude since October 2018. The earlier portions of the record appear to be substantially higher than the more recent concentrations; therefore, the historical measurements were deselected prior to construction of statistical limits which results in limits that better represent present-day water quality conditions. A list of well/constituent pairs utilizing a truncated portion of their records follows this report (Date Ranges Table).

Intrawell Parameters—Prediction Limits

All available background data through April 2022, except in cases mentioned above, were used to establish intrawell background limits, combined with a 1-of-2 resample plan, that will be used for future comparisons (Figure E).

Interwell Parameters—Trend Testing

For parameters tested using interwell analyses (calcium, chloride, and pH at Chattanooga Shale; and chloride and sulfate at Rome Limestone), the Sen's Slope/Mann-Kendall trend test was used to evaluate data at upgradient wells and determine whether concentrations are statistically increasing, decreasing or stable at the 99% confidence level (Figure F). Statistically significant trends were identified for the following upgradient well/constituent pairs:

Increasing

Chattanooga Shale

- Calcium: MW-1602

Decreasing

Chattanooga Shale

- Calcium: MW-1608
- Chloride: MW-1601 and MW-1608

Rome Limestone

- Chloride: MW-1609

The magnitudes of the trends above are either low relative to average concentrations within each well or would not greatly affect the interwell prediction limits. While chloride at upgradient well MW-1601 exhibited a decrease in concentrations, the entire record was retained since recent concentrations downgradient of the facility at well MW-1612 resemble those reported upgradient of the facility earlier in the record. With limited background samples collected to date, all data from upgradient wells were used to construct interwell prediction limits. As more data are collected, all upgradient well data will be re-evaluated for possible deselection of earlier measurements if they no longer represent present-day groundwater quality conditions.

Interwell Parameters—Prediction Limits

Interwell prediction limits using data through October 2022 for parameters mentioned above, combined with a 1-of-2 resample plan, were constructed from pooled upgradient well data for the Chattanooga Shale and Rome Limestone formations (Figure G). Downgradient measurements will be compared to these background limits during each subsequent semi-annual sampling event.

Evaluation of Appendix IV Parameters – October 2022

Outlier Analysis

Background data were originally screened in June 2019 and all data were re-screened during the October 2021 sample event. The results were submitted with each respective report. During this analysis, data at all wells were re-evaluated through October 2022 using time series plots to confirm previously identified outliers as well as identify new outliers and extreme trending patterns that would lead to artificially elevated statistical limits. For the downgradient well data that are evaluated with confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. Tukey's outlier test confirmed previously flagged values and no changes were made to previously flagged observations. No new observations were flagged among Appendix IV parameters. Any previously flagged values, as discussed below, may be seen on the Outlier Summary table for each formation following this letter.

During previous screenings, Tukey's outlier test on pooled upgradient well data for Chattanooga Shale and Rome Limestone did not identify any potential outliers, and none were flagged. For Dumps Fault Tukey's test identified a high value of molybdenum for well MW-1611 which was flagged as an outlier in the database. Additionally, high values for cobalt and lead in upgradient well MW-1611 were identified visually and flagged prior to construction of upper tolerance limits. The Maximum Contaminant Levels, however, were used as the Groundwater Protection Standard for these constituents in these cases; therefore, these values had no effect on the upper tolerance limits. Values identified as outliers are flagged with "o" and displayed in a lighter font and disconnected symbol on the time series graphs. Summaries of all flagged outliers are included in Figure C for each of the three formations.

Interwell Upper Tolerance Limits

Interwell upper tolerance limits were calculated to create background limits for the Appendix IV constituents from all available pooled upgradient well data through October 2022 at each of the formations (Figures H). Parametric limits use a target of 95% confidence and 95% coverage. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. During this analysis, the background limit for lithium was reported to three significant figures where applicable, as requested by Geosyntec Consultants.

An update was made to the Sanitas™ statistical software in October 2022 that determines the percentage of non-detects within a given background record rather than all records evaluated for a given constituent. Simple substitution of 1/2 the reporting limit is applied when the percentage of non-detects is <15% in accordance with the USEPA EPA Unified Guidance (2009). No significant changes to the tolerance limits or confidence intervals resulted from this implementation.

Groundwater Protection Standards

Interwell upper tolerance using limits were compared to the Maximum Contaminant Levels (MCLs) and CCR-Rule specified levels, as shown in the Groundwater Protection Standards (GWPS) table following this letter (Figures I), to determine the highest limit for use as the GWPS in the Confidence Interval comparisons.

Confidence Intervals

Confidence intervals were then constructed for each Appendix IV constituent and each downgradient well using data through October 2022 (Figures J). The confidence intervals were then compared against the GWPS for each constituent to assess compliance. Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete results of the confidence interval analysis follow this letter. The following confidence interval exceedances were identified using all available data within each well:

Chattanooga Shale

- Barium: MW-1603, MW-1604, and MW-1612
- Lithium: MW-1605

Rome Limestone

- Cobalt: MW-1607
- Lithium: MW-1606 and MW-1607
- Molybdenum: MW-1607

Dumps Fault

- Cobalt: MW-1610
- Lithium: MW-1610
- Molybdenum: MW-1610

Trend Test Evaluation – Appendix IV

Data at wells with confidence interval exceedances are further evaluated using the Sen's Slope/Mann Kendall trend test at the 99% confidence level to determine whether concentrations are statistically increasing, decreasing, or stable (Figure K). Upgradient wells are included in the trend analyses to identify whether similar patterns exist upgradient of the site for the same constituents. When trends are present in upgradient trends, it is an indication of natural variability in groundwater quality unrelated to practices at the site. A summary of the Appendix IV trend test results follows this letter. Statistically significant trends were identified for the following well/constituent pairs:

Increasing

Chattanooga Shale

- Barium: MW-1603

Rome Limestone

- None

Dumps Fault

- None

Decreasing

Chattanooga Shale

- Barium: MW-1601, MW-1602, and MW-1608 (all upgradient)
- Lithium: MW-1608 (upgradient)

Rome Limestone

- Lithium: MW-1609 (upgradient)

Dumps Fault

- Cobalt: MW-1611 (upgradient) and MW-1610
- Lithium: MW-1611 (upgradient)

Note that the decreasing trend for lithium at Rome Limestone is a byproduct of reporting limits earlier in the record compared to trace values later in the record.

Confidence Intervals – Most Recent 8 Measurements

Downgradient well/constituent pairs that exceed their respective GWPS when using the entire record of data as discussed earlier and that are found to have statistically significant

decreasing trends are further evaluated using confidence intervals constructed with only the most recent 8 measurements through October 2022 to determine present-day groundwater quality conditions relative to the respective GWPSs (Figure L). This included cobalt in downgradient well MW-1610 at Dumps Fault, which was the only downgradient well/constituent pair to meet these criteria. The confidence interval was compared against the same respective GWPS to assess compliance. Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete results of the confidence interval analysis follow this letter and no exceedance was identified for cobalt at well MW-1610.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Clinch River Pond 1. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



Andrew T. Collins
Project Manager

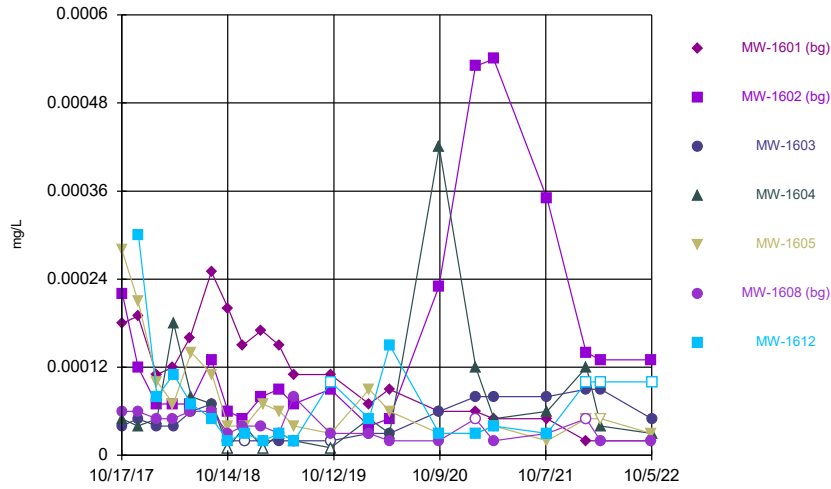


Kristina L. Rayner
Senior Statistician

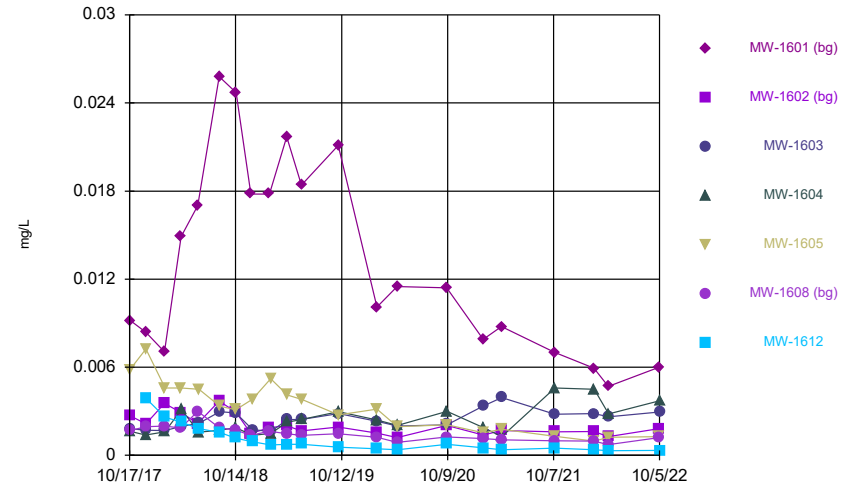
FIGURE A.

Time Series - Chattanooga Shale

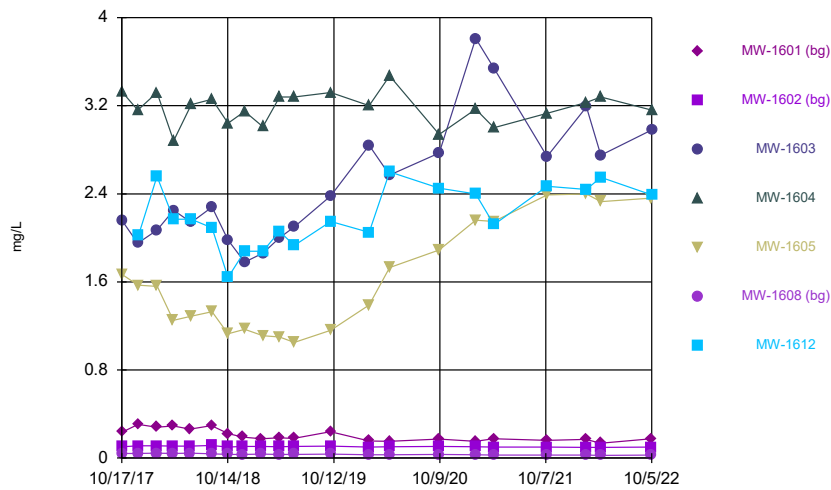
Time Series



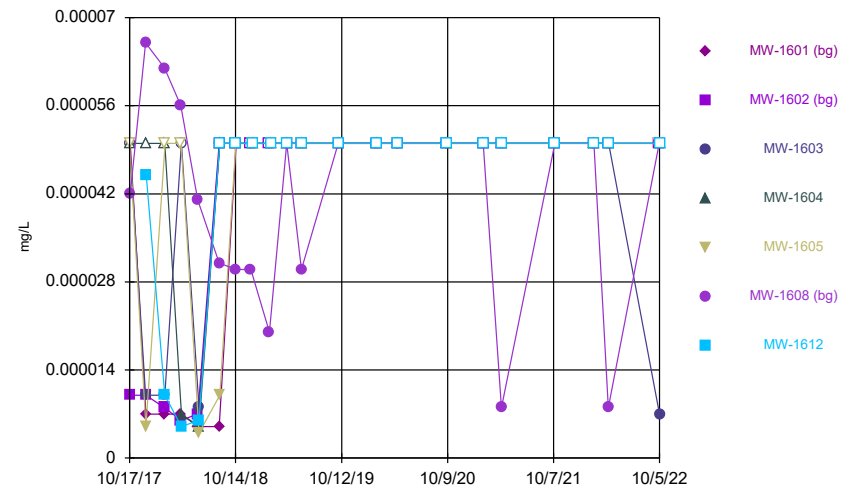
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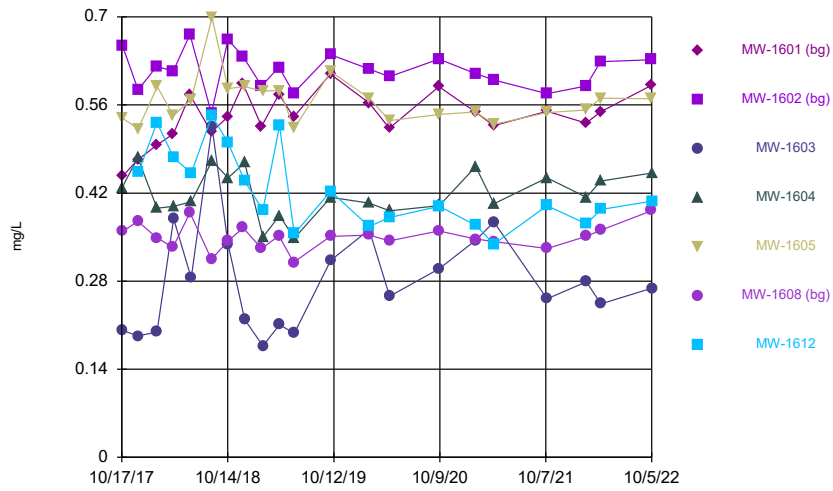
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Time Series



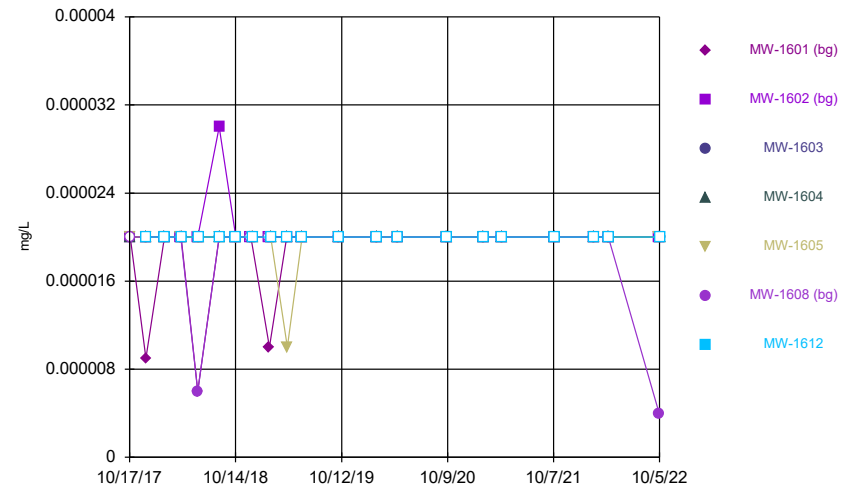
Time Series



Constituent: Boron total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

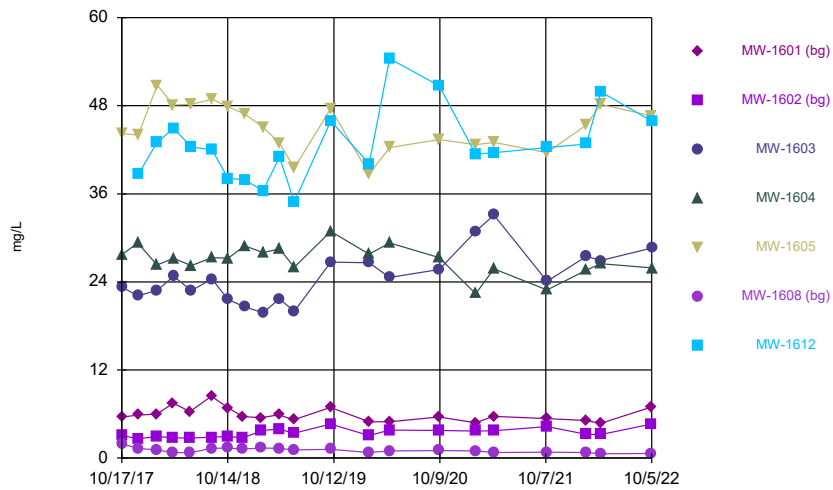
Hollow symbols indicate censored values.

Time Series



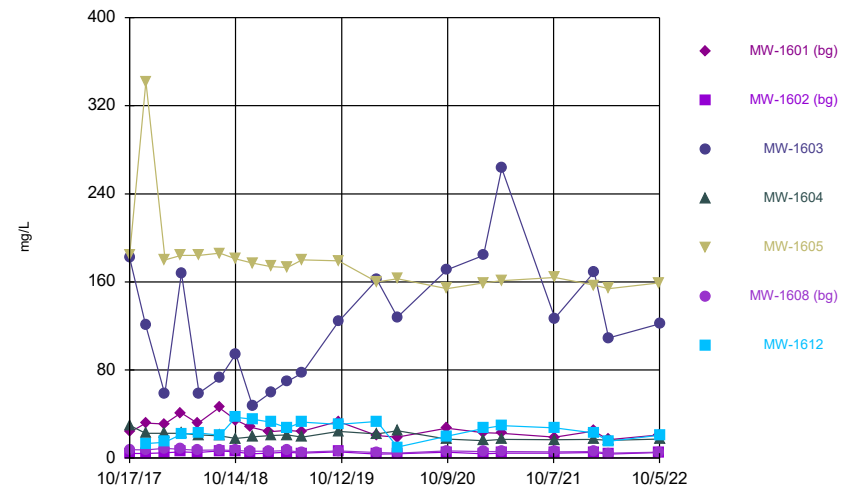
Constituent: Cadmium total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



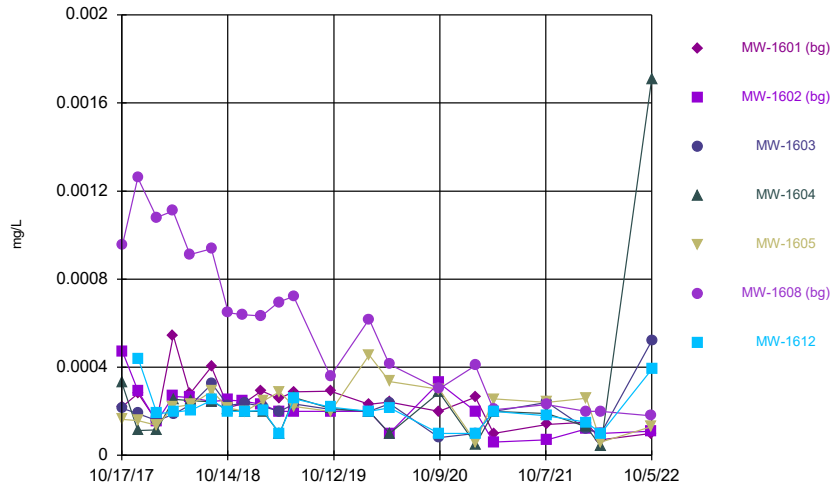
Constituent: Calcium total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



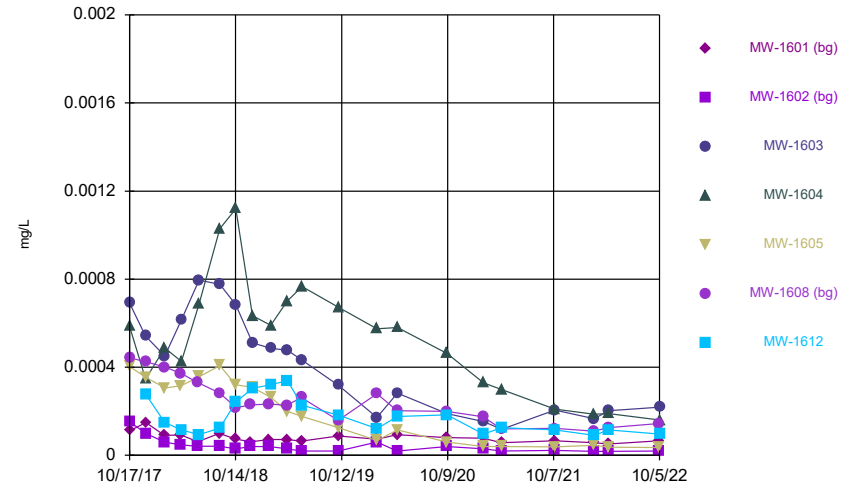
Constituent: Chloride total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



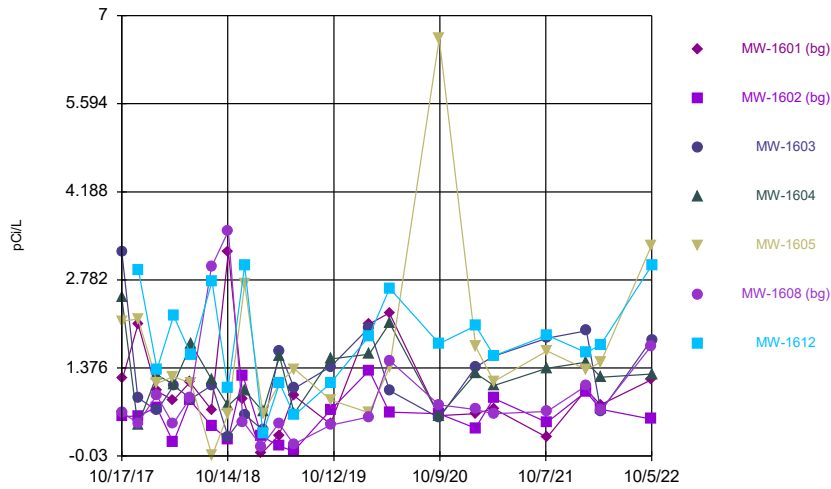
Constituent: Chromium total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



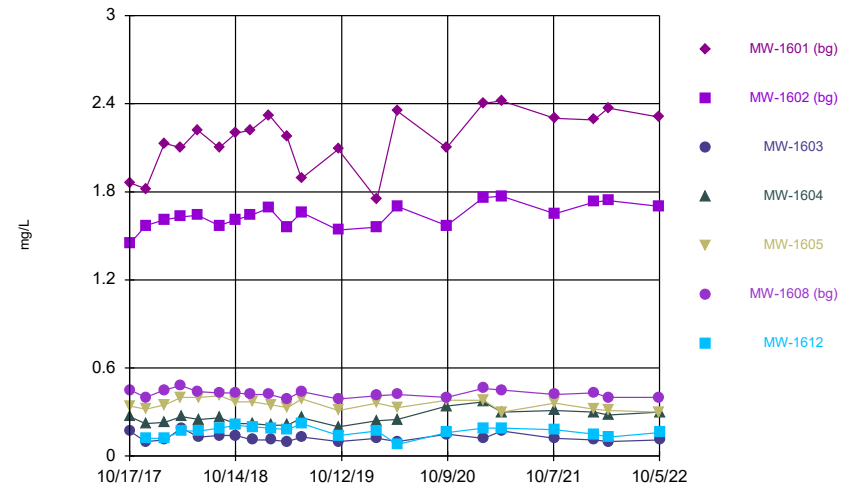
Constituent: Cobalt total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



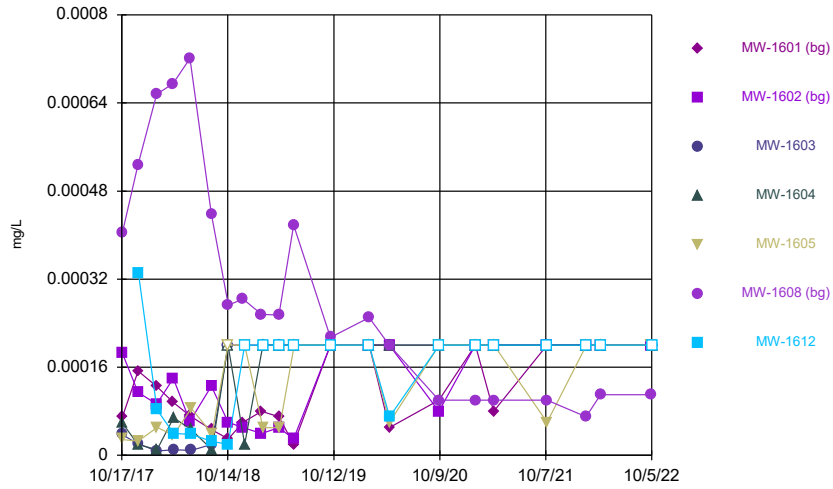
Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale
Clinch River LF Client: AEP Data: Clinch River

Time Series



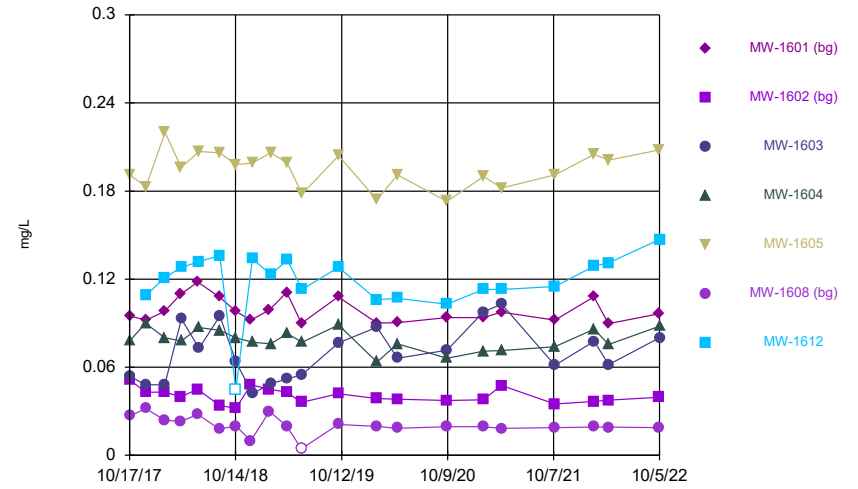
Constituent: Fluoride total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



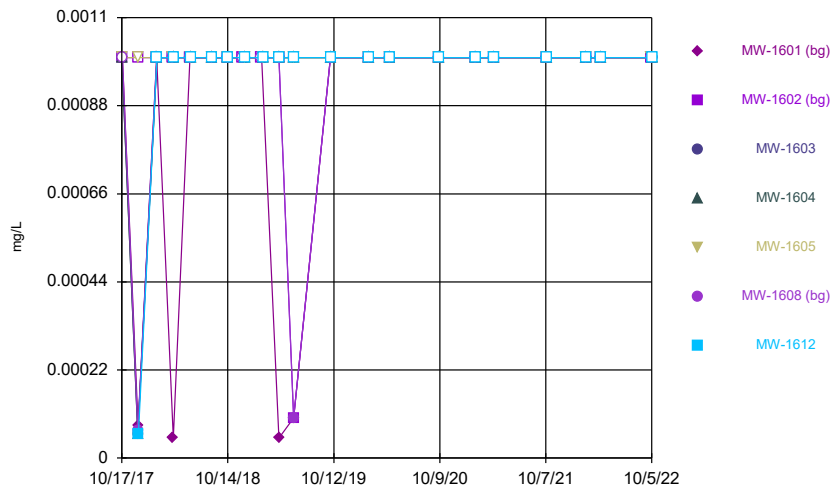
Constituent: Lead total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



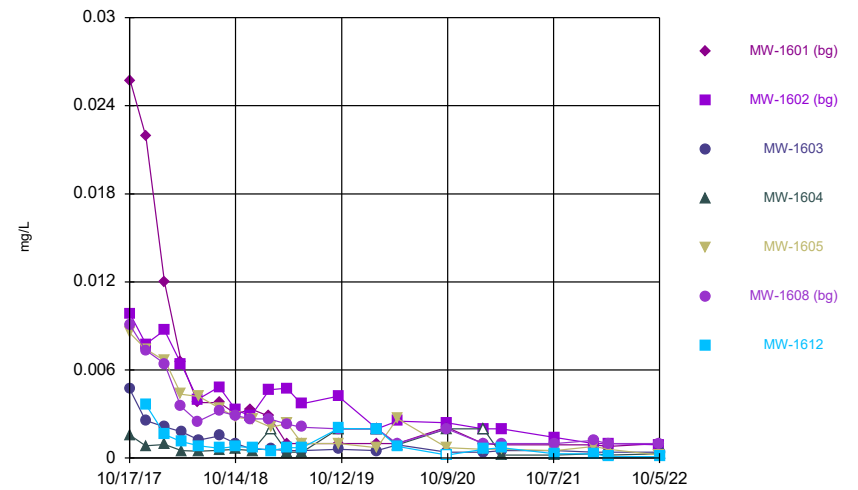
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Clinch River LF Client: AEP Data: Clinch River

Time Series



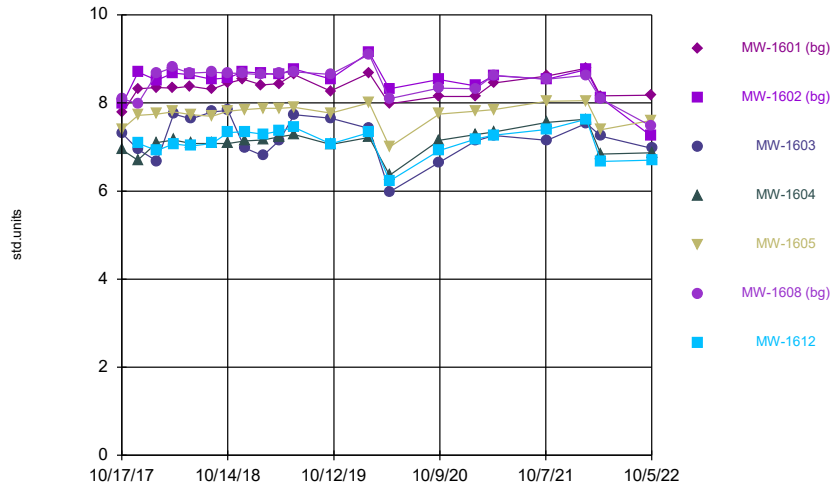
Constituent: Mercury total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Molybdenum total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

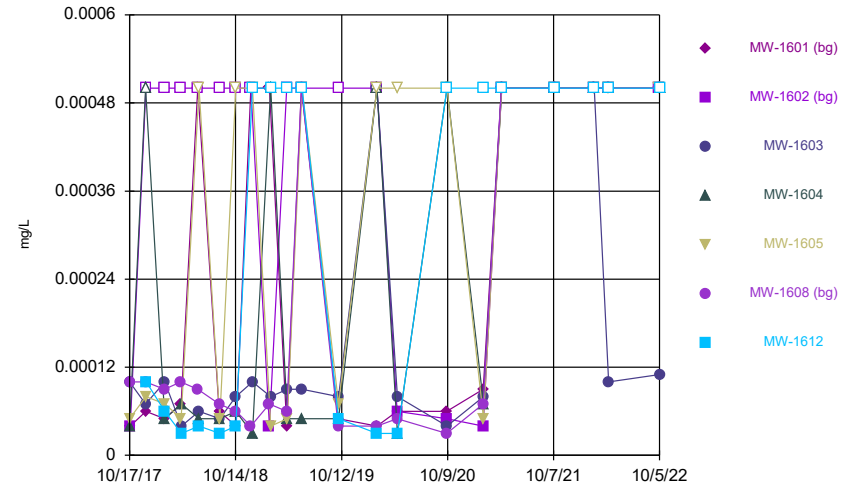
Time Series



Constituent: pH [field] Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

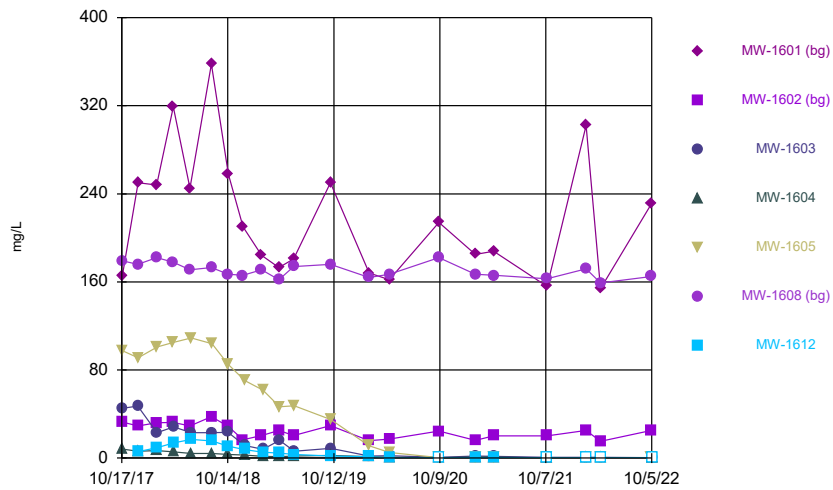
Time Series



Constituent: Selenium total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

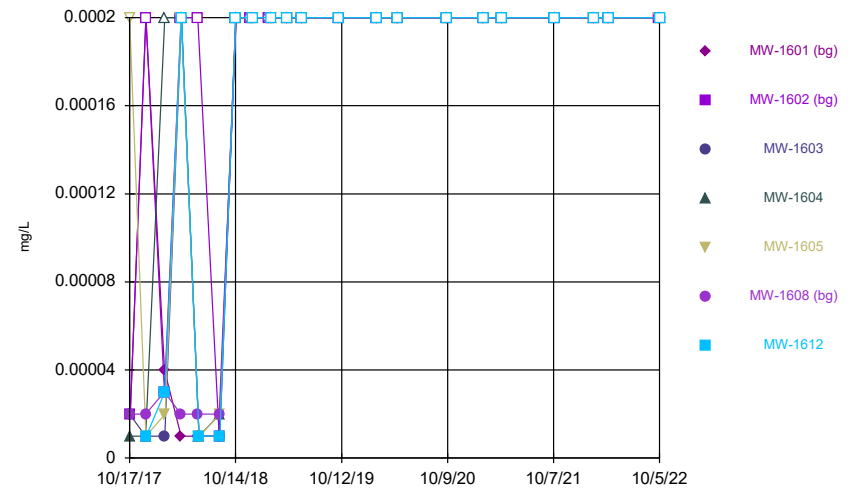
Time Series



Constituent: Sulfate total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

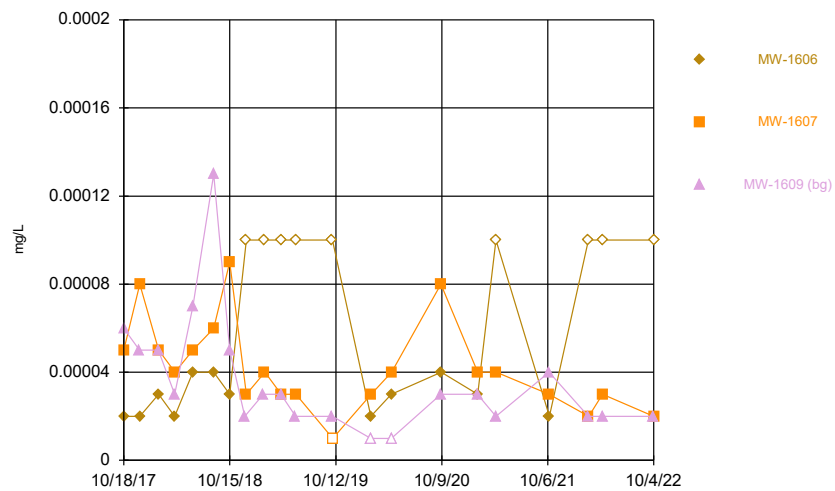
Time Series



Constituent: Thallium total Analysis Run 1/24/2023 12:19 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

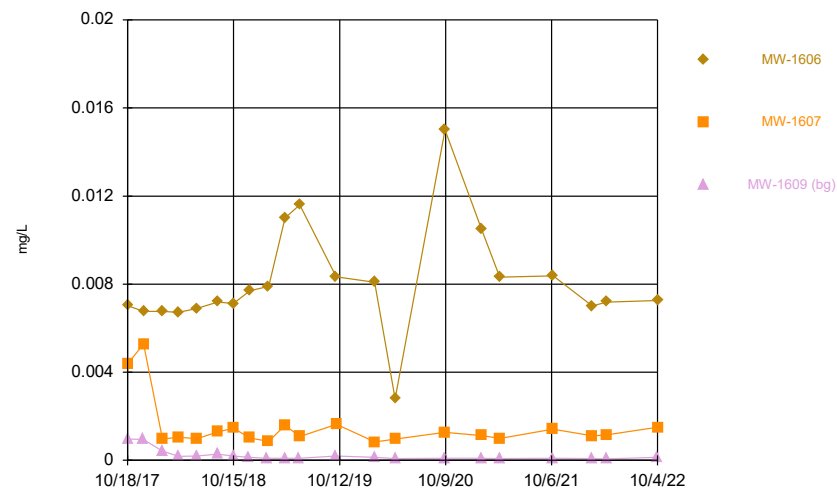
Time Series - Rome Limestone

Time Series



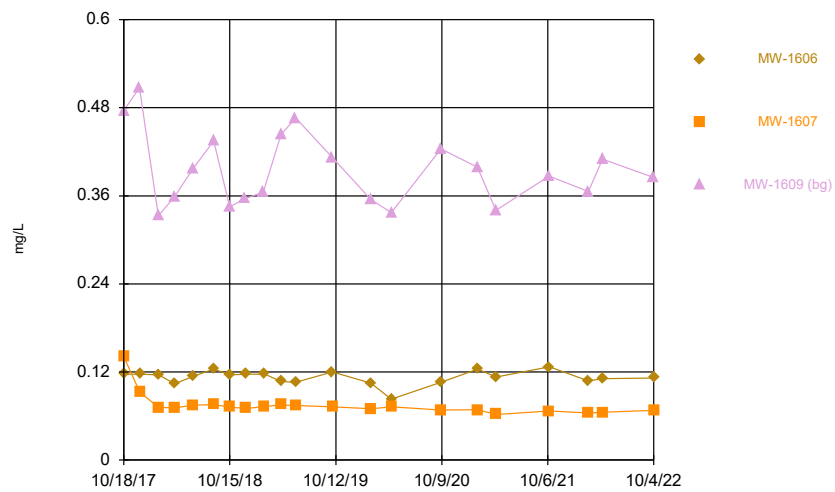
Constituent: Antimony total Analysis Run 1/24/2023 2:16 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



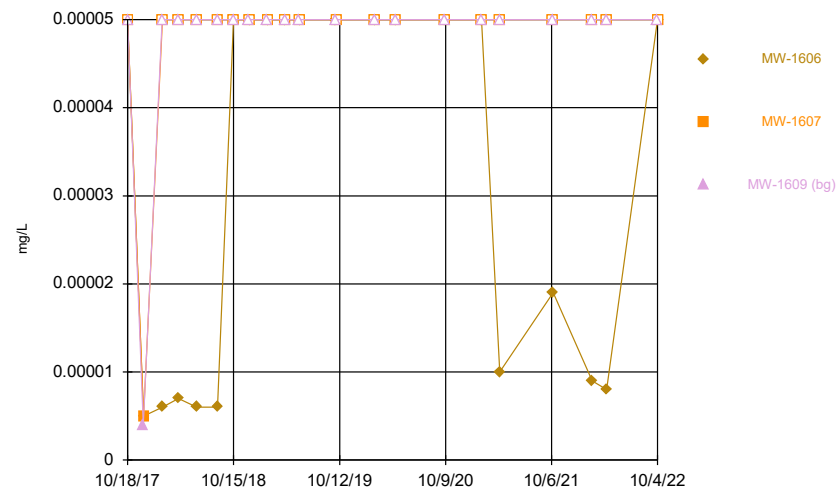
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Clinch River LF Client: AEP Data: Clinch River

Time Series



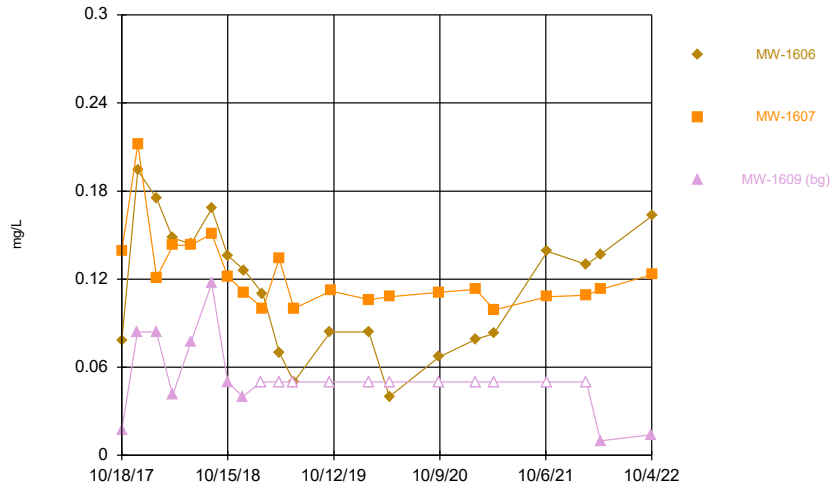
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Clinch River LF Client: AEP Data: Clinch River

Time Series



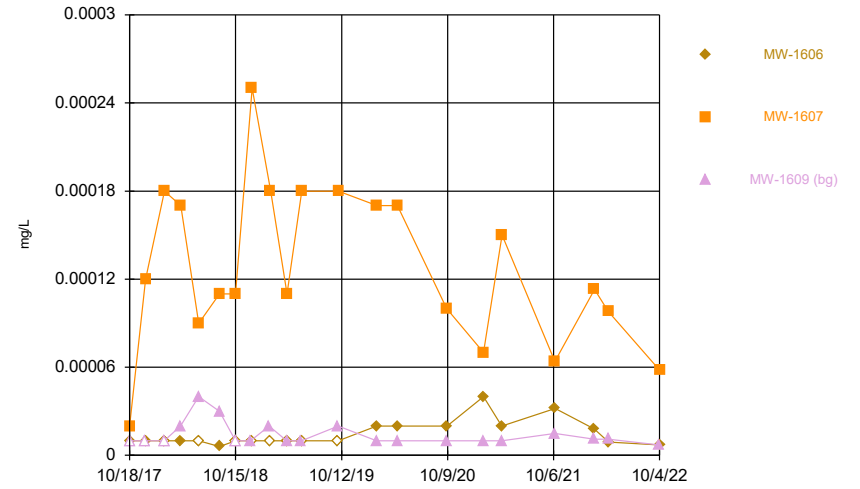
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Clinch River LF Client: AEP Data: Clinch River

Time Series



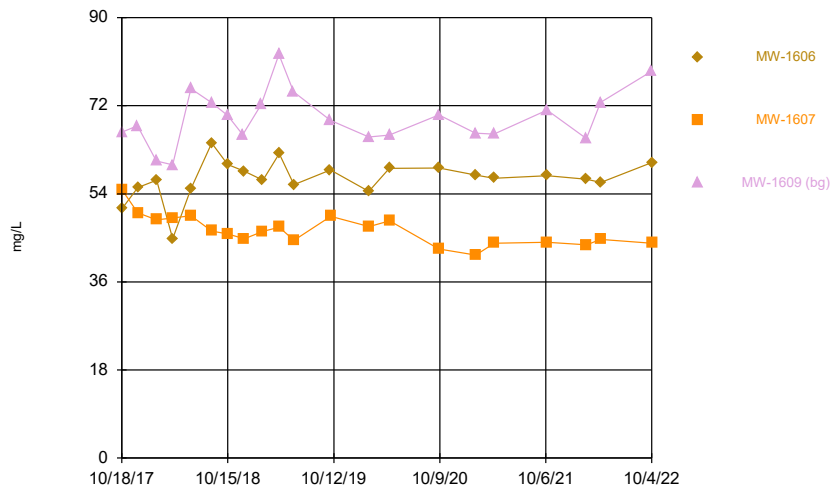
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Clinch River LF Client: AEP Data: Clinch River

Time Series



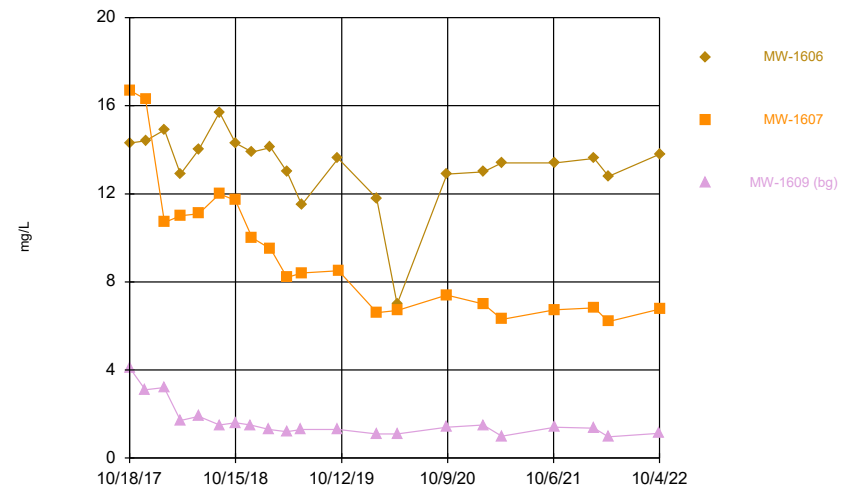
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Clinch River LF Client: AEP Data: Clinch River

Time Series



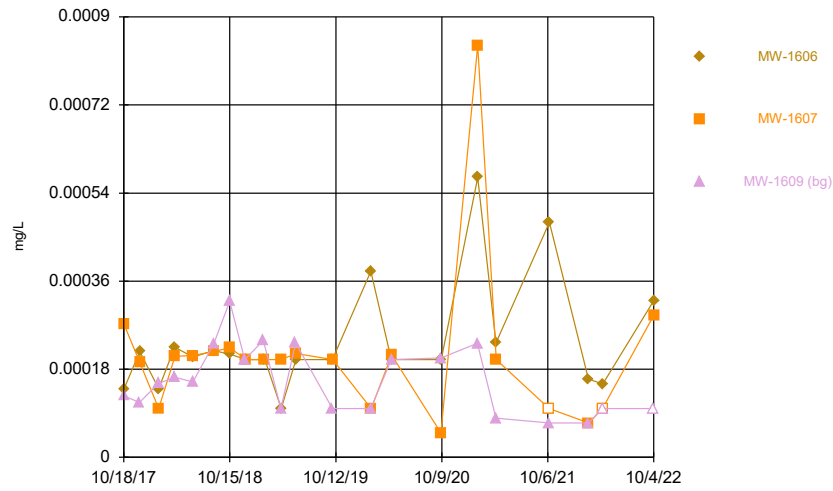
Constituent: Calcium total Analysis Run 1/24/2023 2:16 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



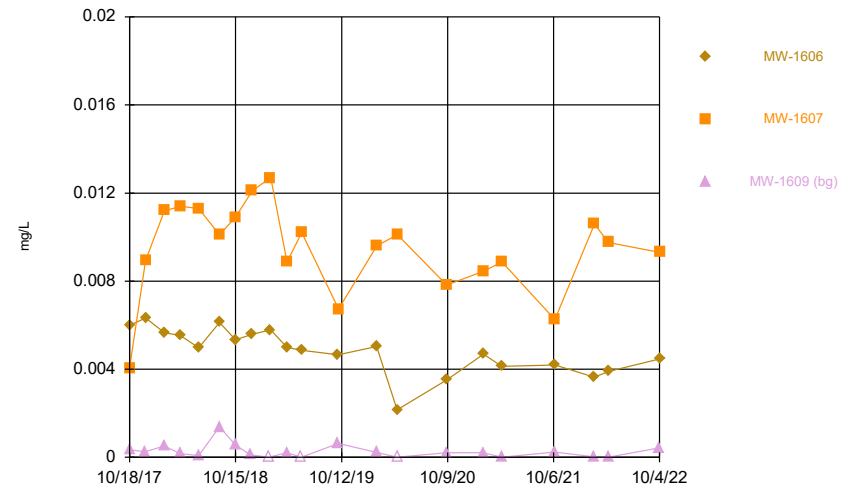
Constituent: Chloride total Analysis Run 1/24/2023 2:16 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



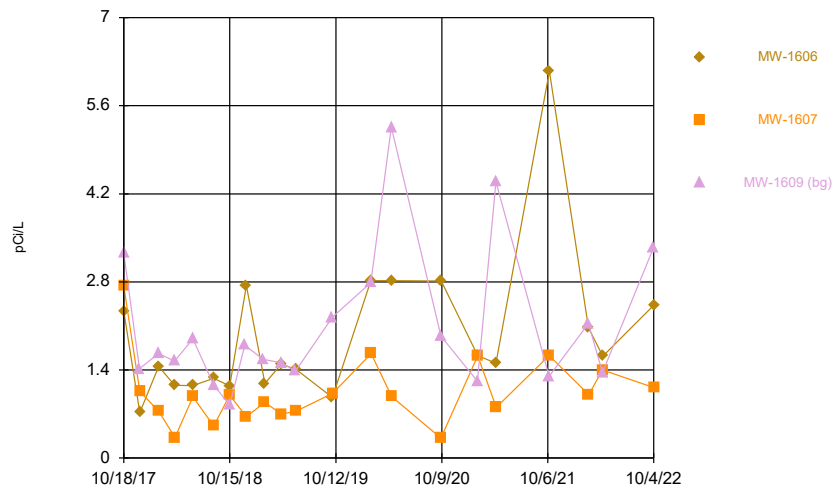
Constituent: Chromium total Analysis Run 1/24/2023 2:16 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



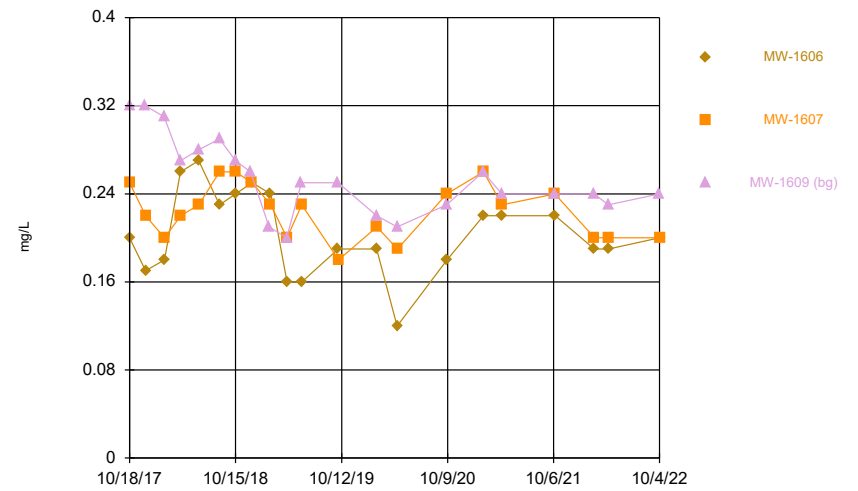
Constituent: Cobalt total Analysis Run 1/24/2023 2:16 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



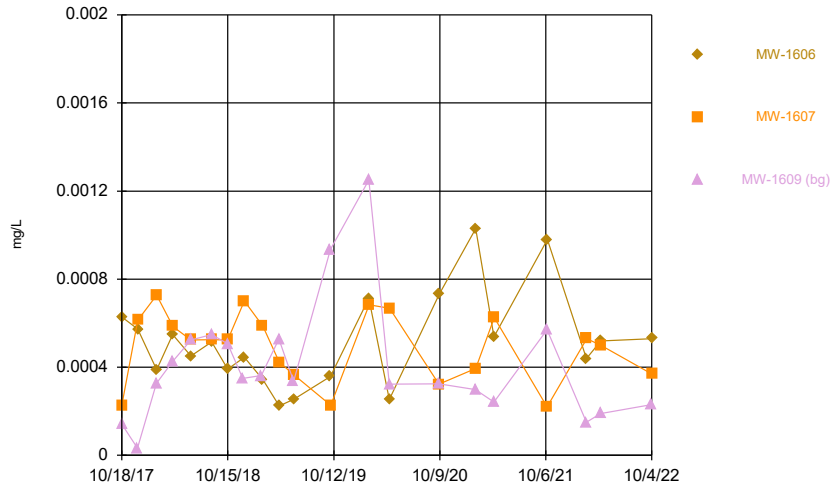
Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 2:17 PM View: Rome Limestone - P
Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Fluoride total Analysis Run 1/24/2023 2:17 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

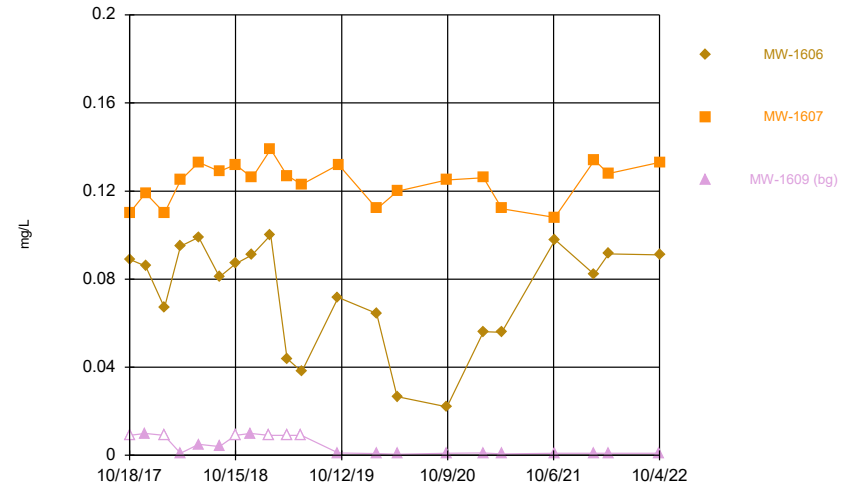
Time Series



Constituent: Lead total Analysis Run 1/24/2023 2:17 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

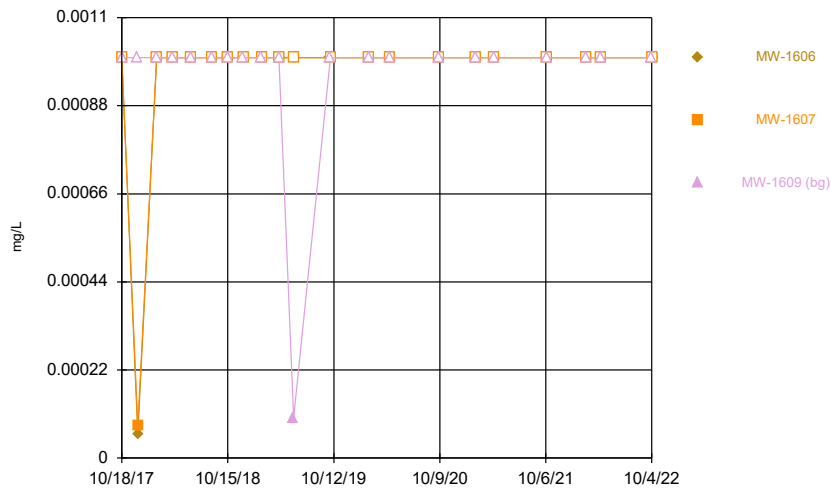
Time Series



Constituent: Lithium total Analysis Run 1/24/2023 2:17 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

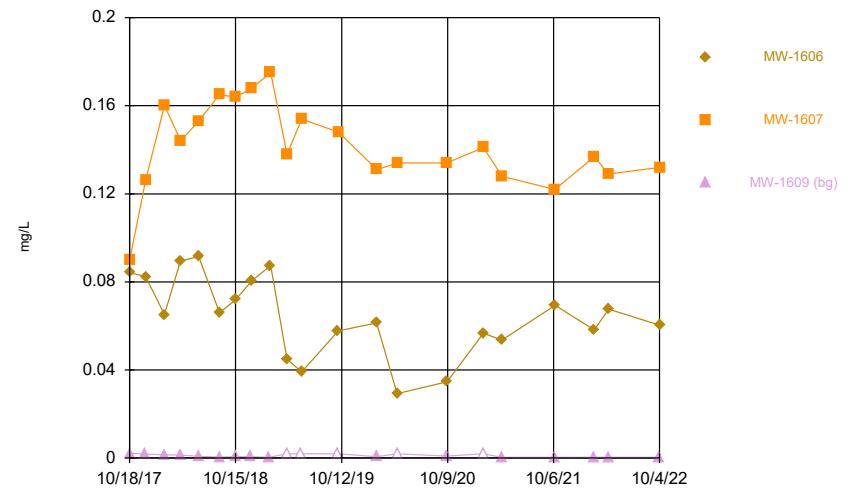
Time Series



Constituent: Mercury total Analysis Run 1/24/2023 2:17 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

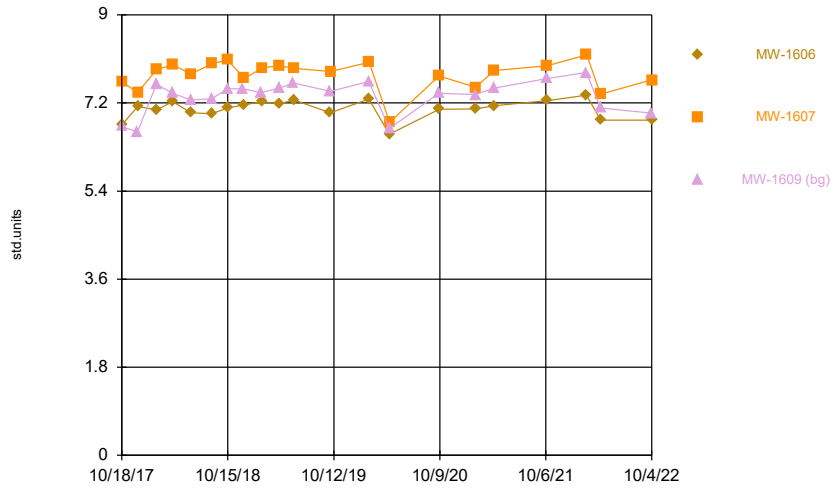
Hollow symbols indicate censored values.

Time Series



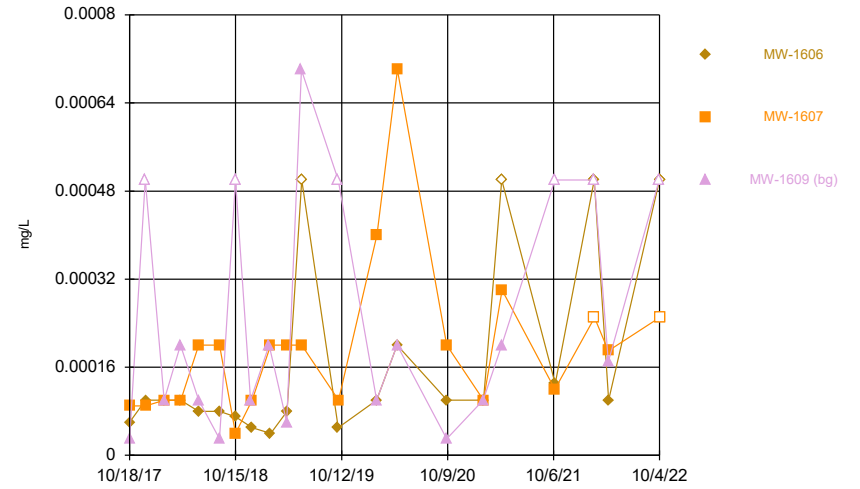
Constituent: Molybdenum total Analysis Run 1/24/2023 2:17 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



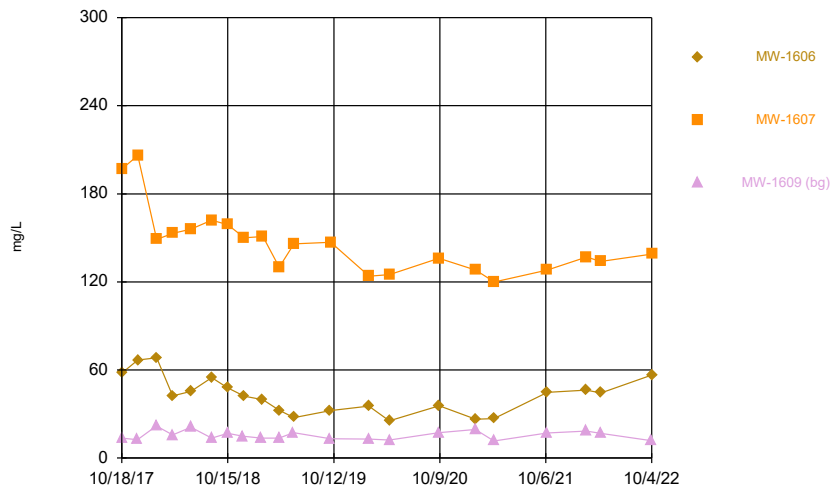
Constituent: pH [field] Analysis Run 1/24/2023 2:17 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



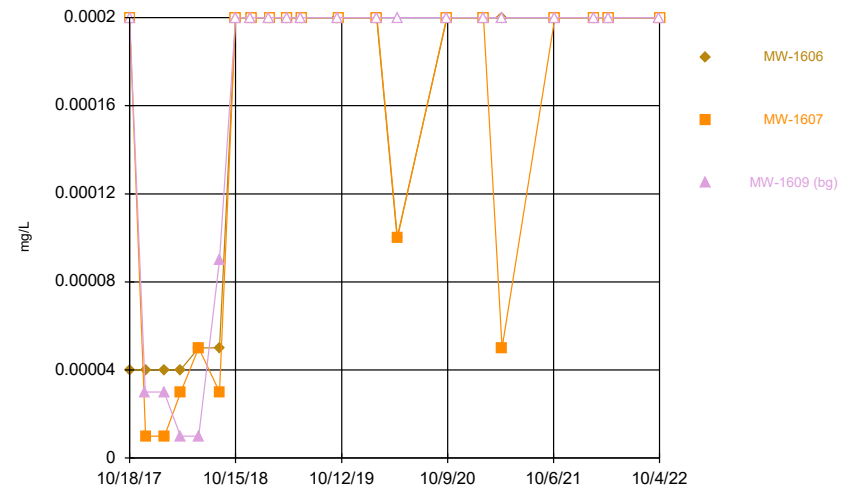
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Clinch River LF Client: AEP Data: Clinch River

Time Series



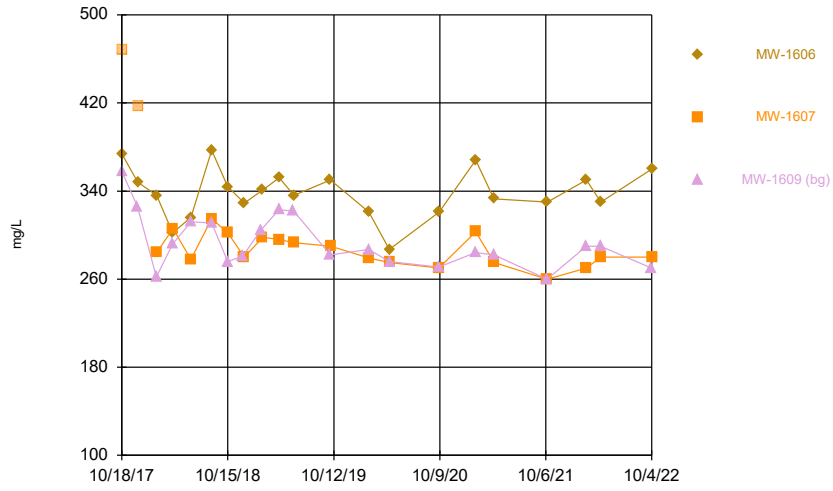
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Clinch River LF Client: AEP Data: Clinch River

Time Series



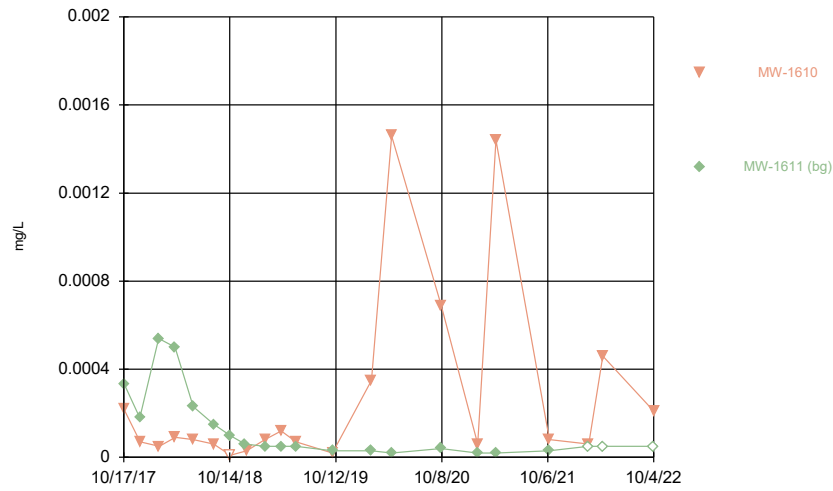
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Clinch River LF Client: AEP Data: Clinch River

Time Series



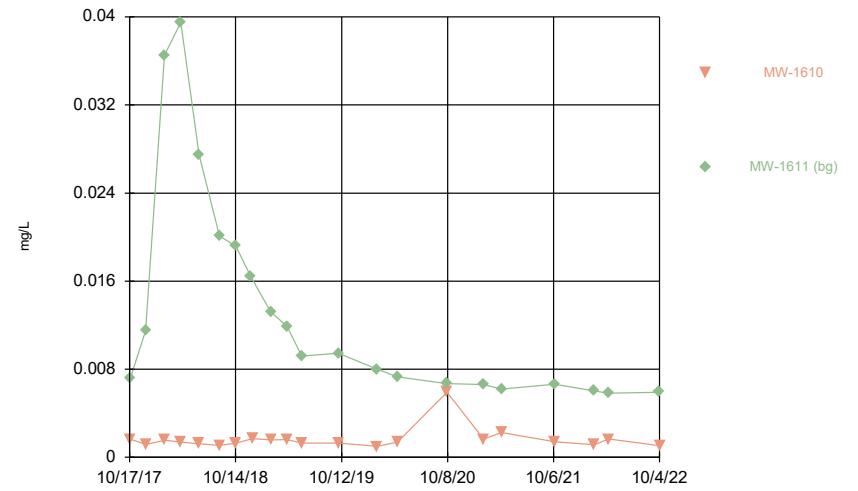
Time Series - Dumps Fault

Time Series



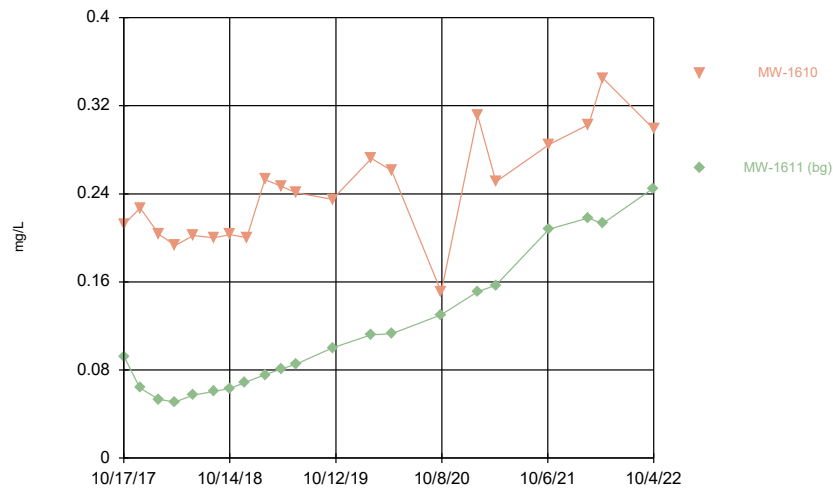
Constituent: Antimony total Analysis Run 1/24/2023 3:28 PM View: Dumps Fault - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Time Series



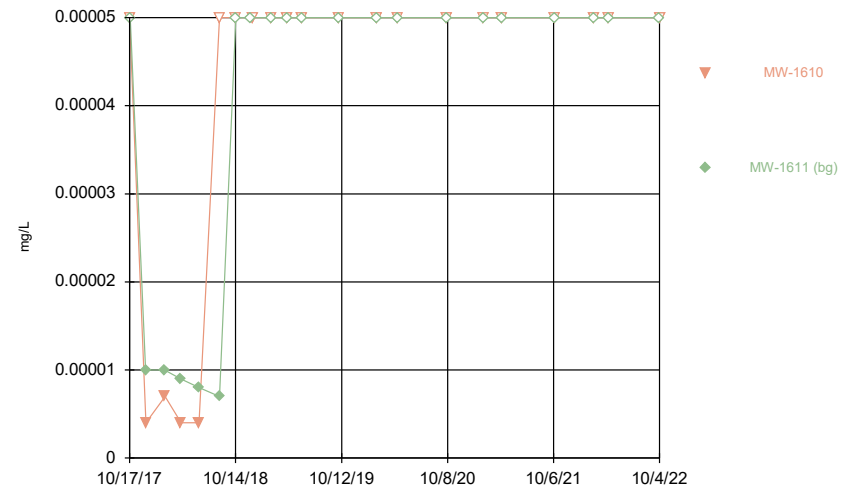
Constituent: Arsenic total Analysis Run 1/24/2023 3:28 PM View: Dumps Fault - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Time Series



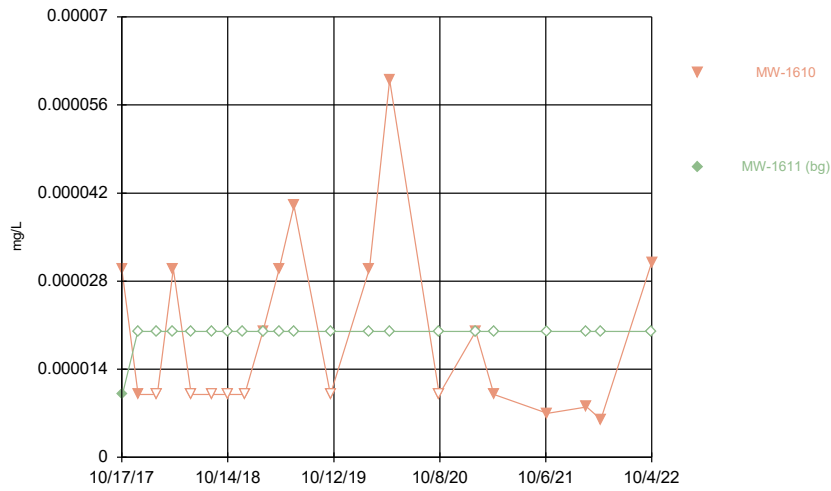
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



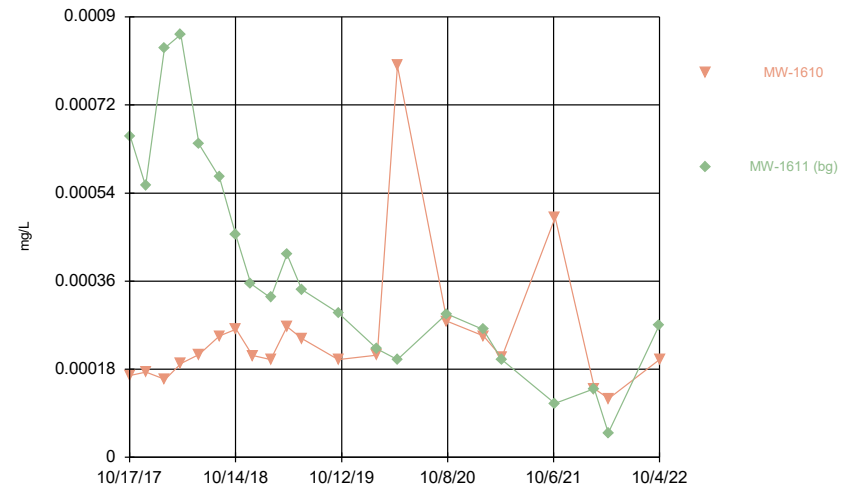
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



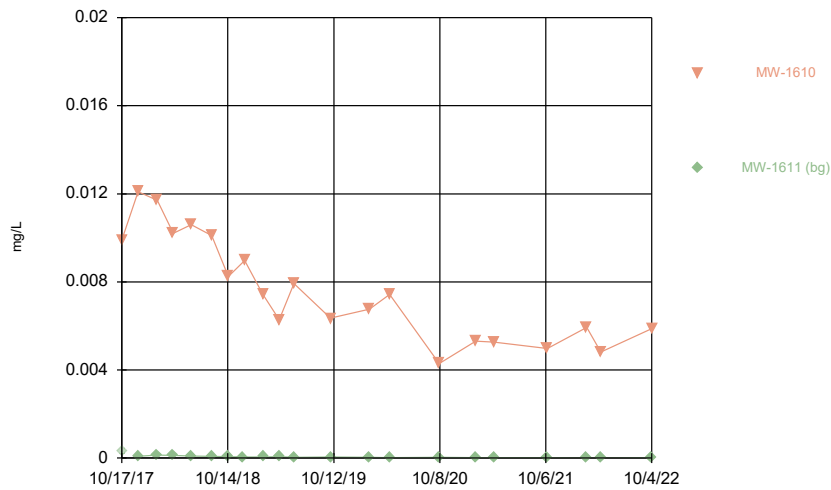
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Clinch River LF Client: AEP Data: Clinch River

Time Series



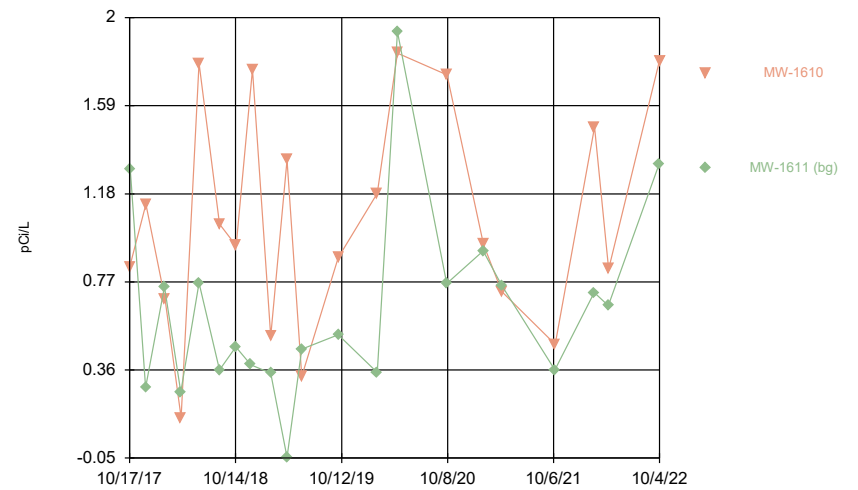
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Clinch River LF Client: AEP Data: Clinch River

Time Series



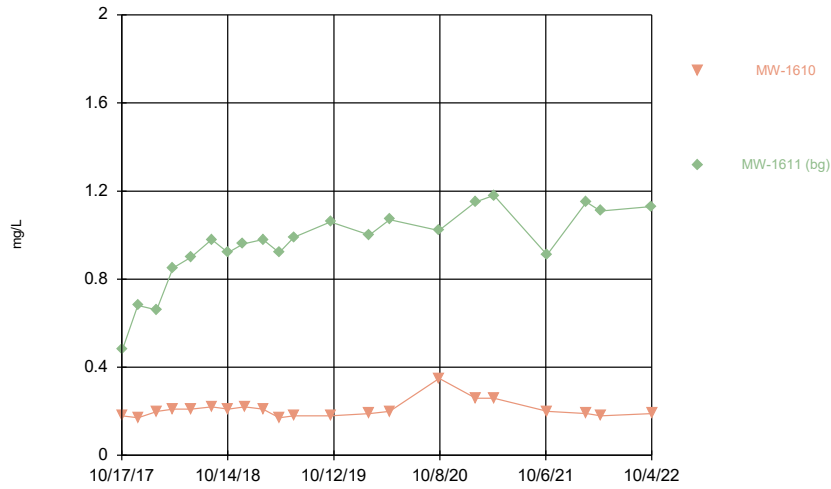
Constituent: Cobalt total Analysis Run 1/24/2023 3:28 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 3:28 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Time Series



Time Series

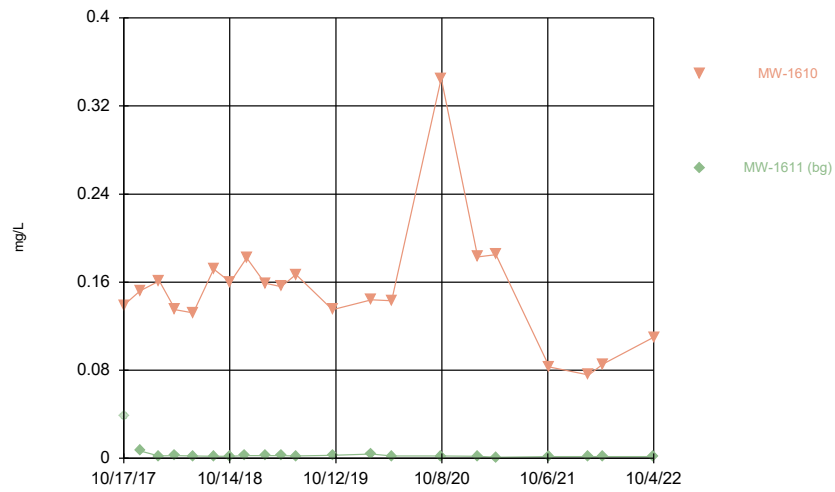
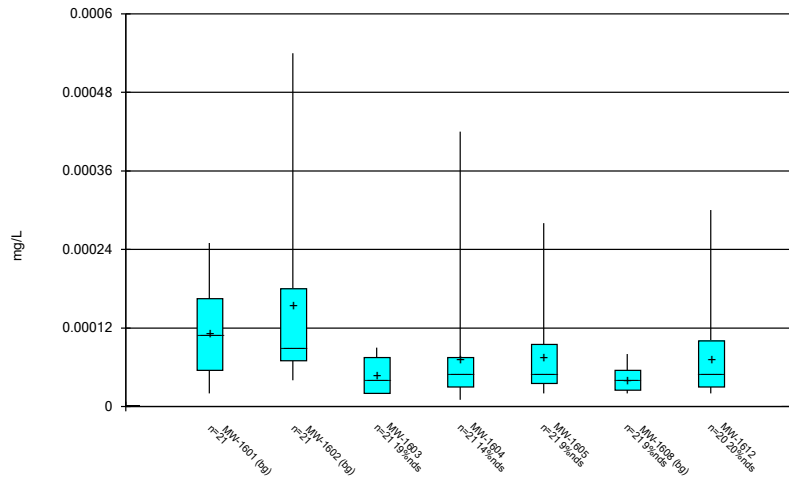


FIGURE B.

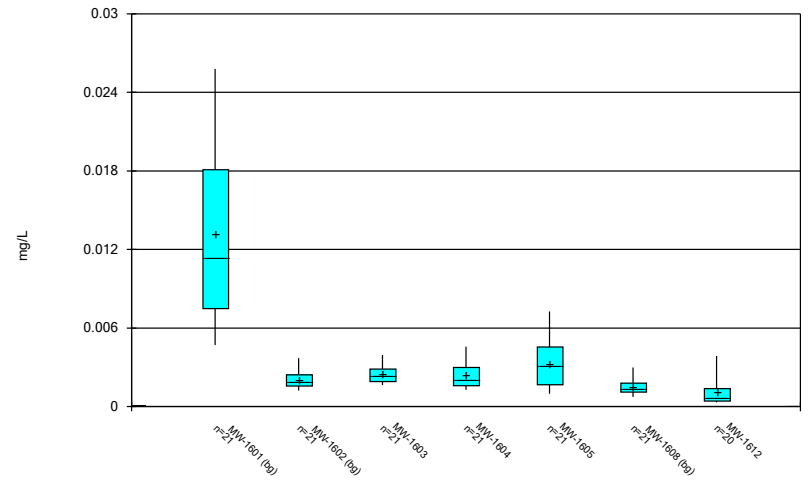
Box Plots - Chattanooga Shale

Box & Whiskers Plot



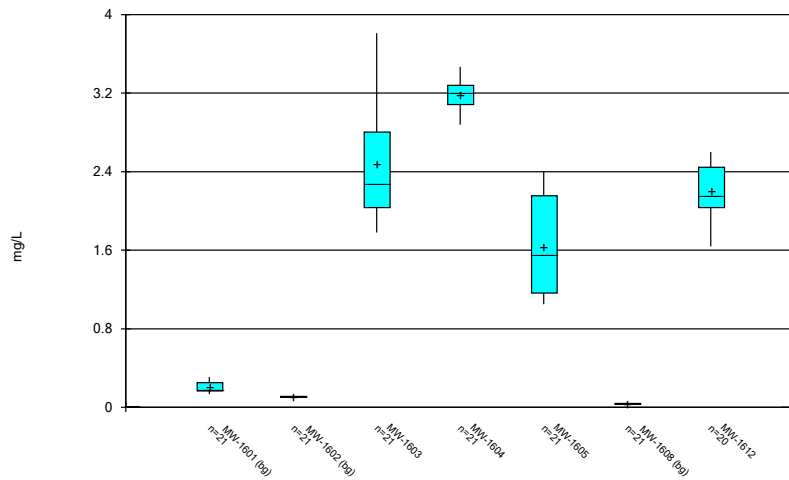
Constituent: Antimony total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



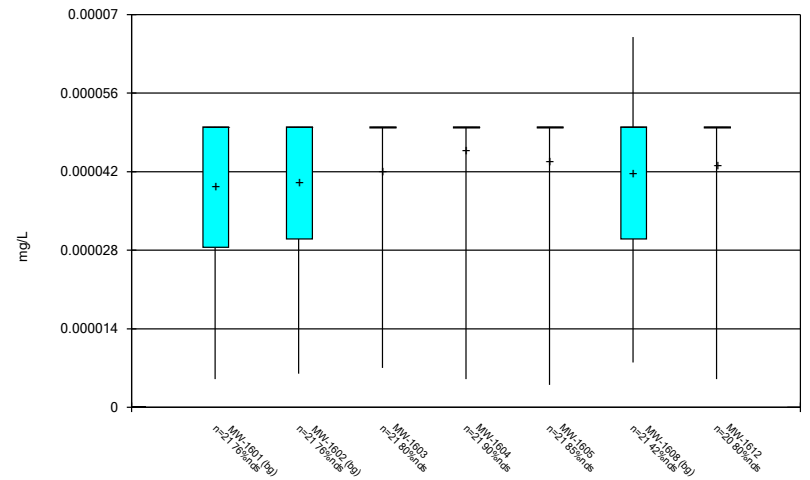
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



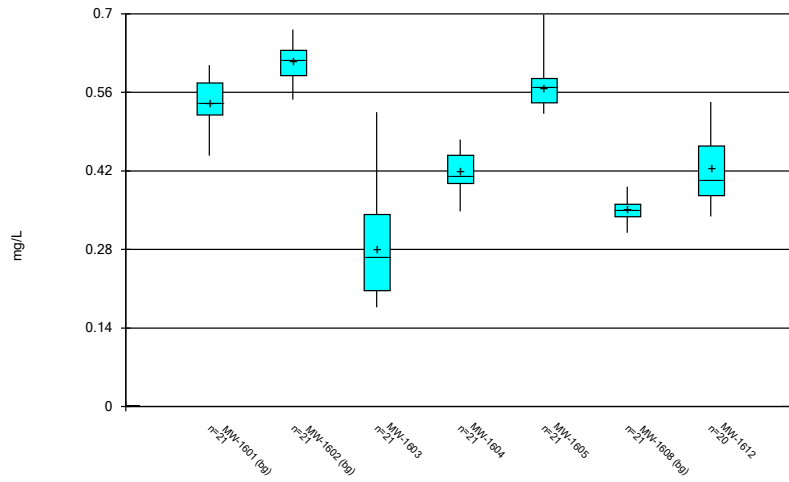
Constituent: Barium total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



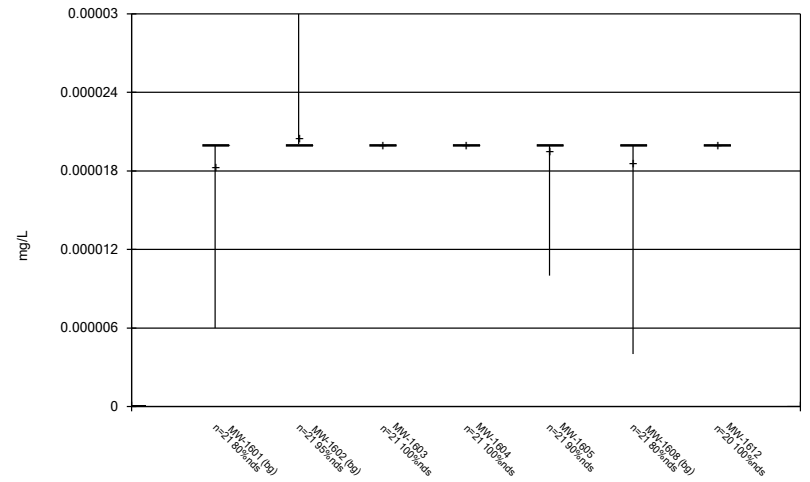
Constituent: Beryllium total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



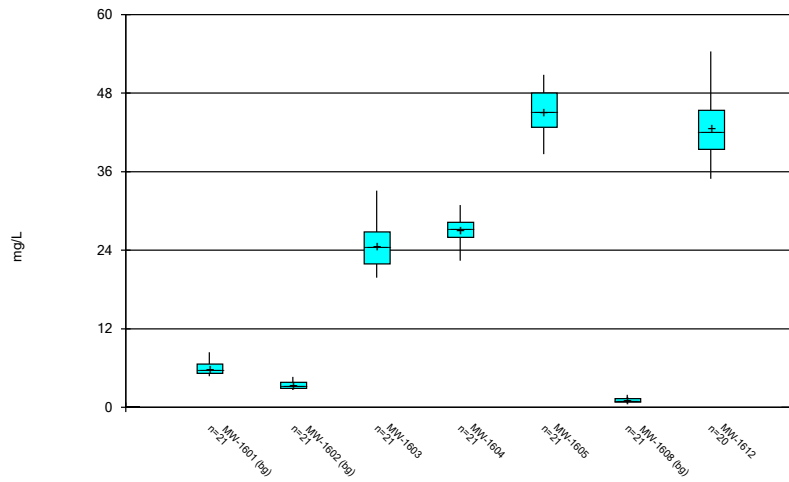
Constituent: Boron total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



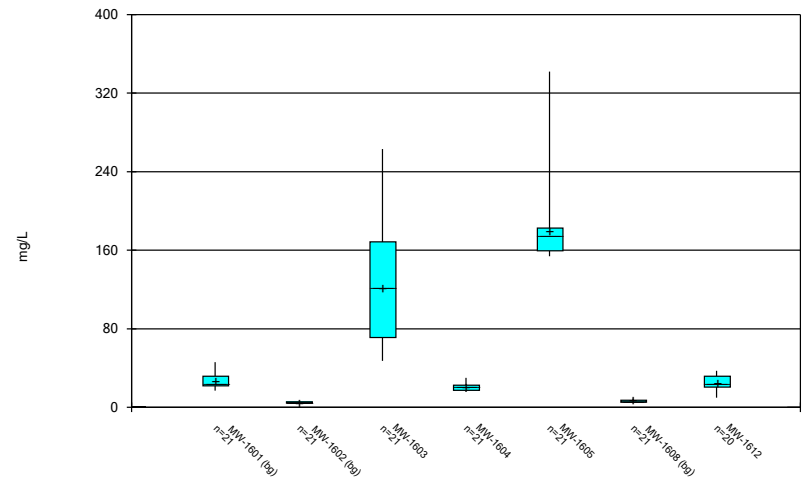
Constituent: Cadmium total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



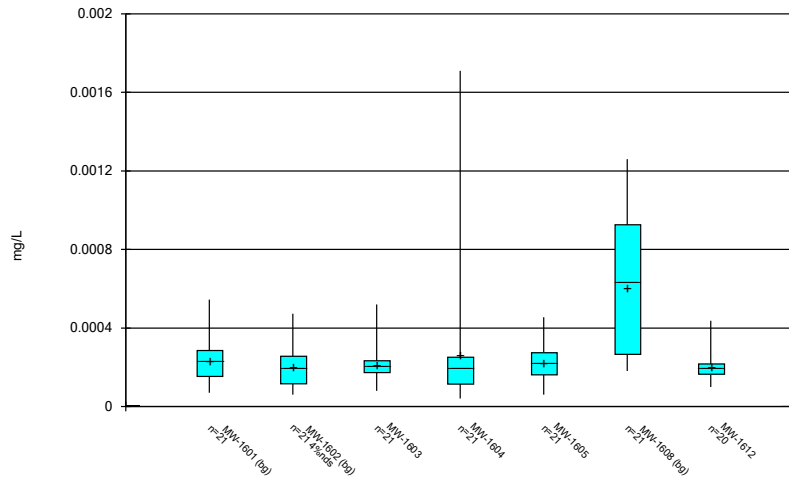
Constituent: Calcium total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



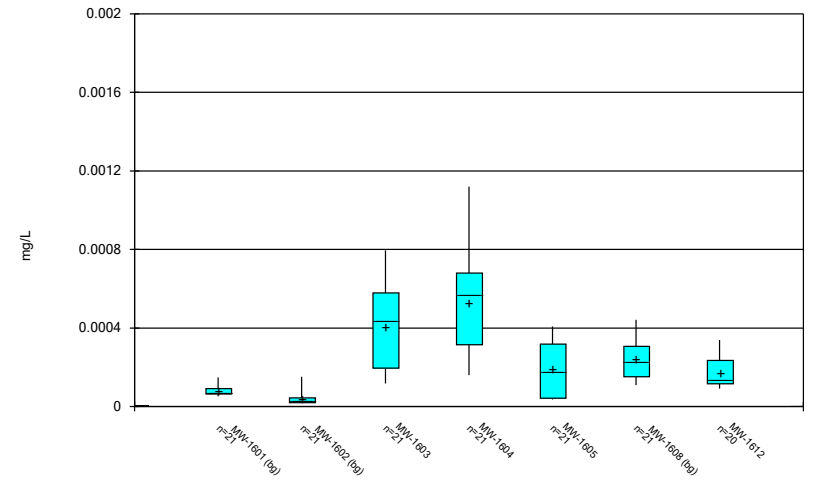
Constituent: Chloride total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



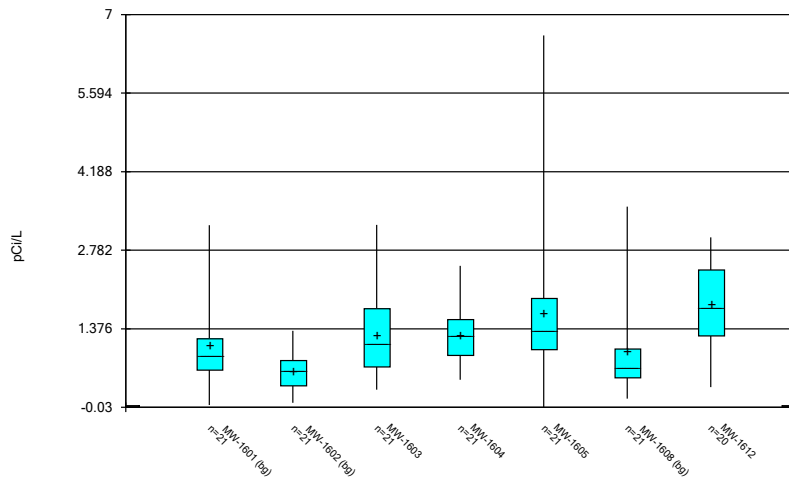
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



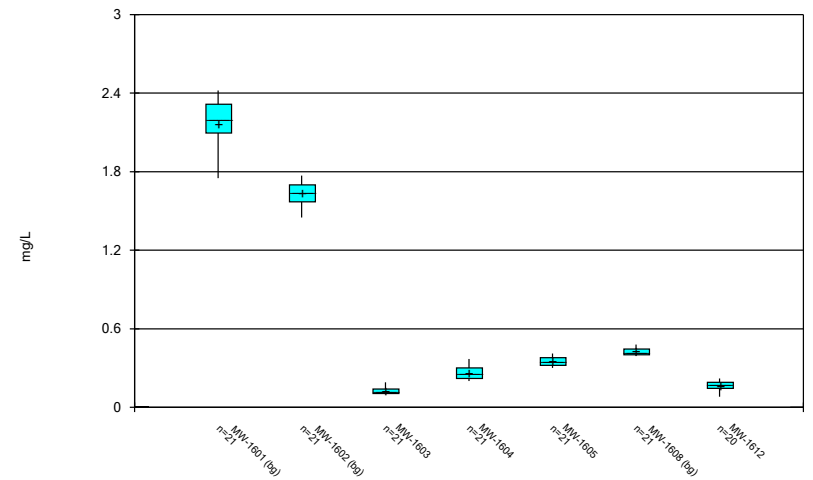
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



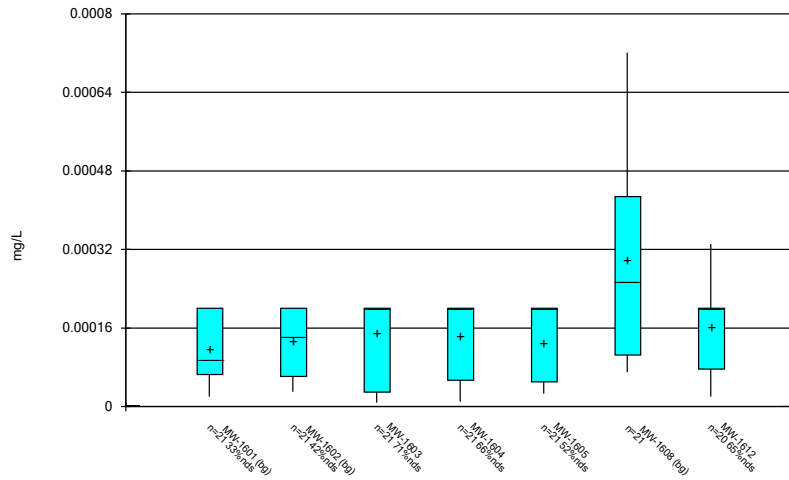
Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



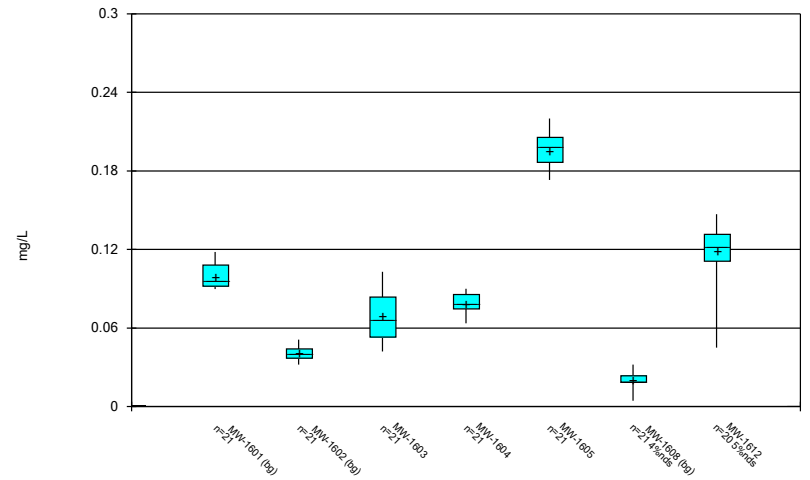
Constituent: Fluoride total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



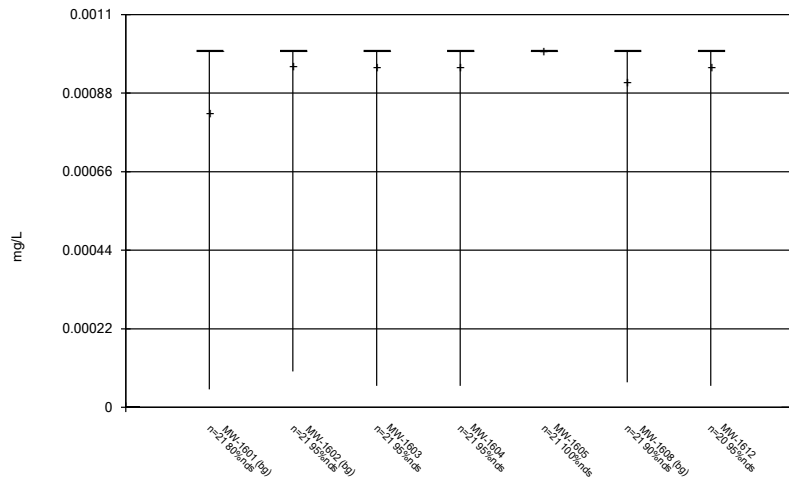
Constituent: Lead total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



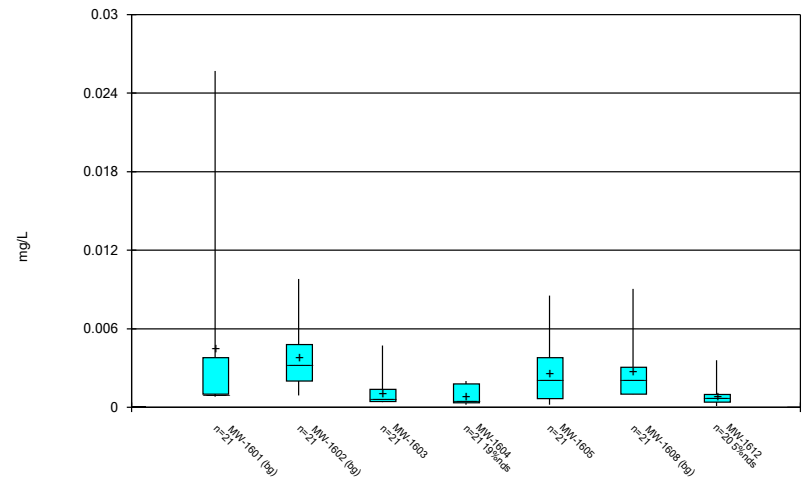
Constituent: Lithium total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



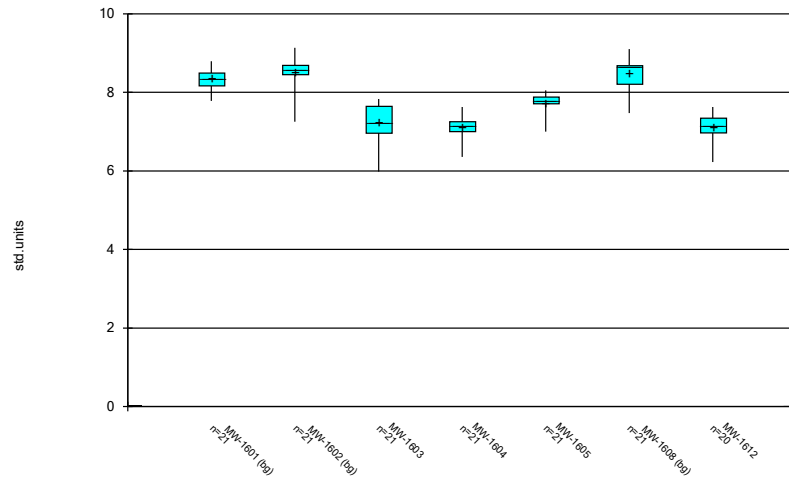
Constituent: Mercury total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



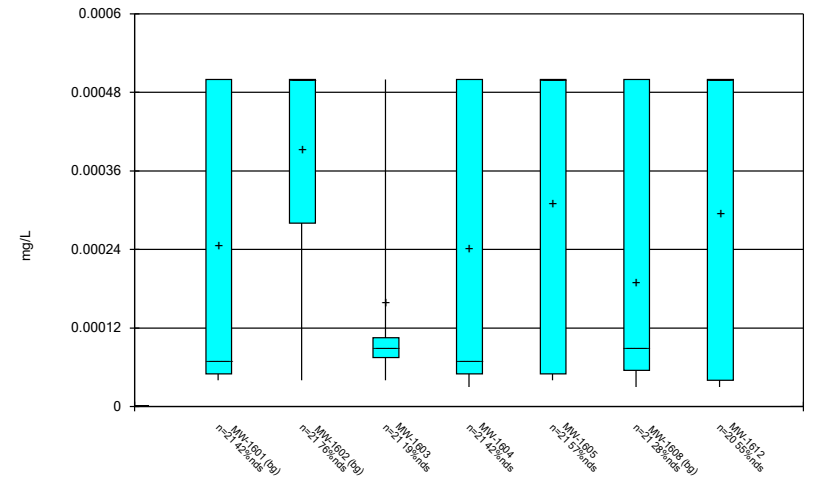
Constituent: Molybdenum total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



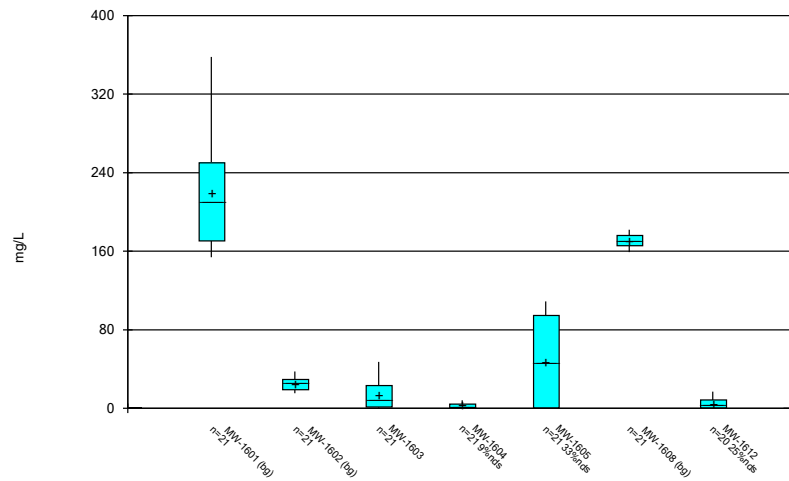
Constituent: pH [field] Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



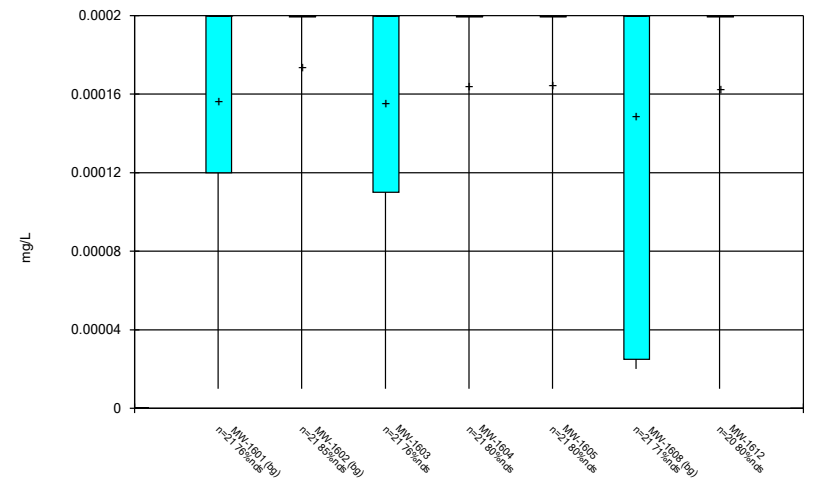
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



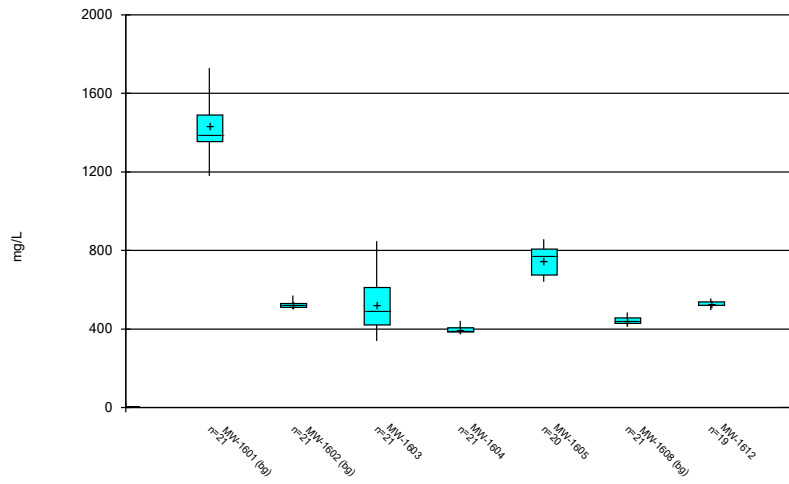
Constituent: Sulfate total Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



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Clinch River LF Client: AEP Data: Clinch River

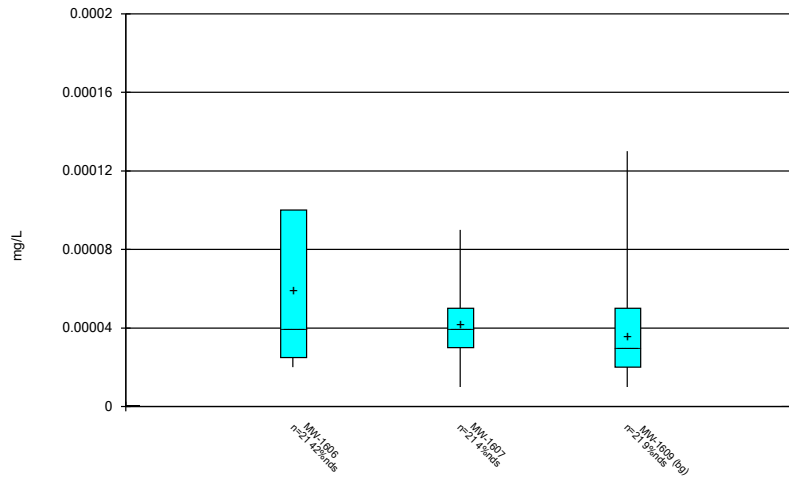
Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:20 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

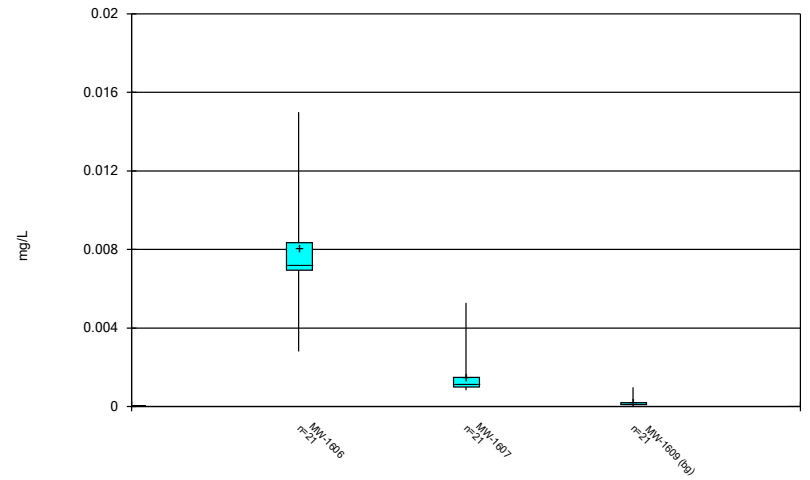
Box Plots - Rome Limestone

Box & Whiskers Plot



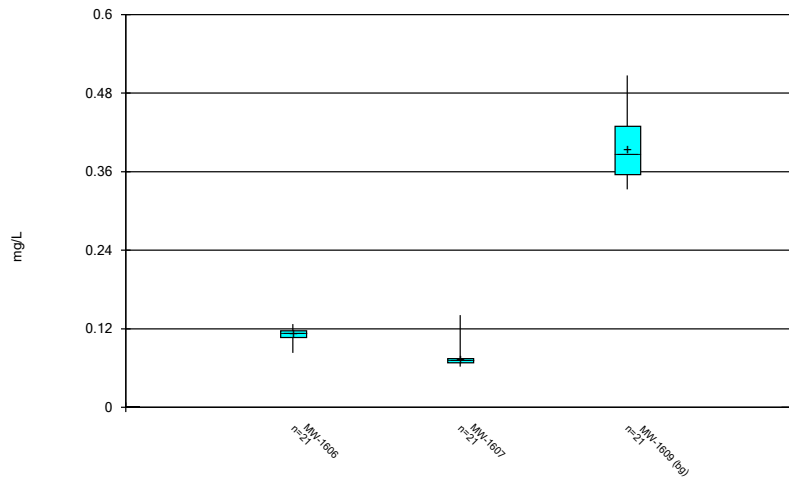
Constituent: Antimony total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



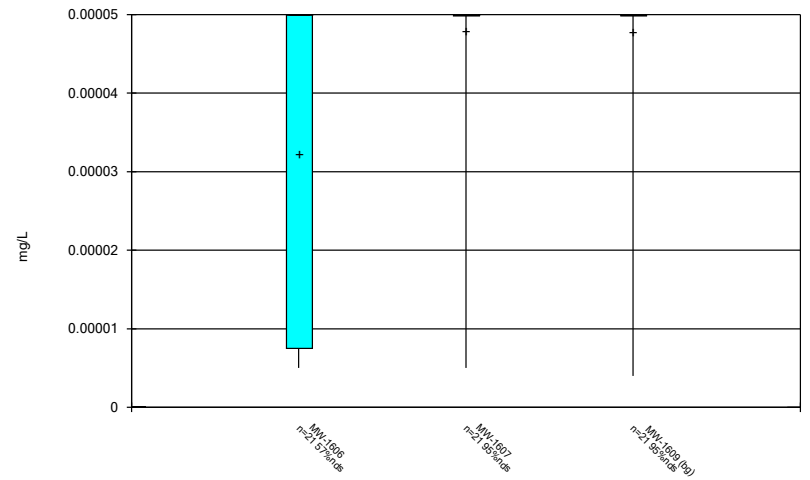
Constituent: Arsenic total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



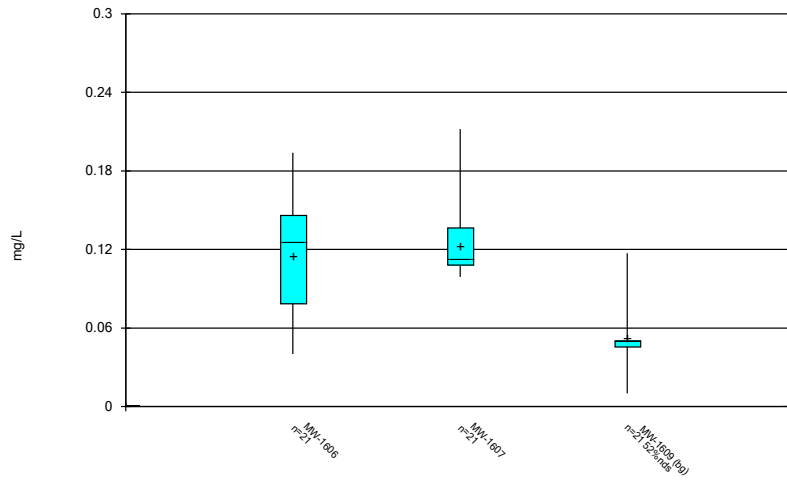
Constituent: Barium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



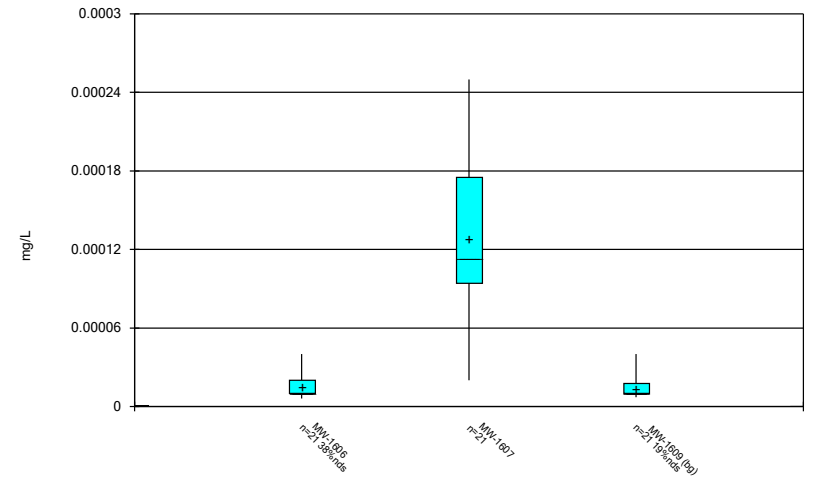
Constituent: Beryllium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



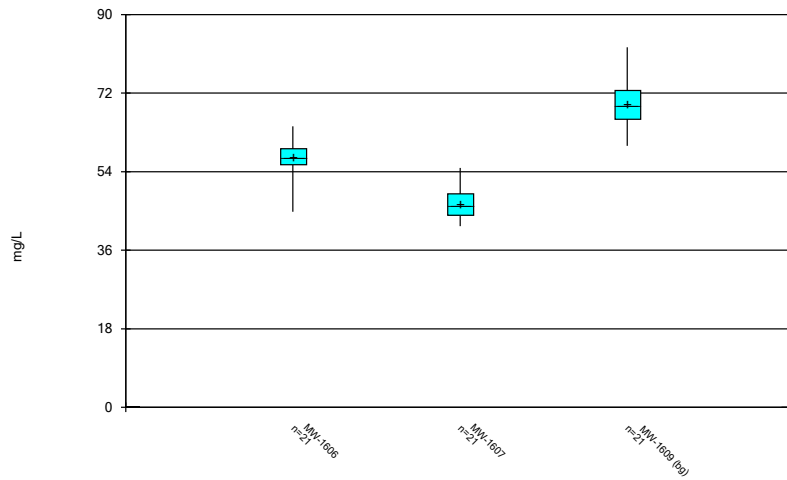
Constituent: Boron total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



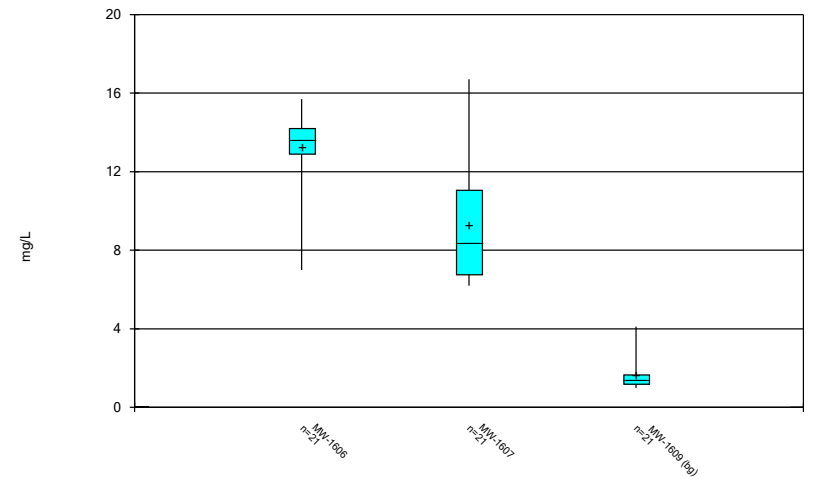
Constituent: Cadmium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



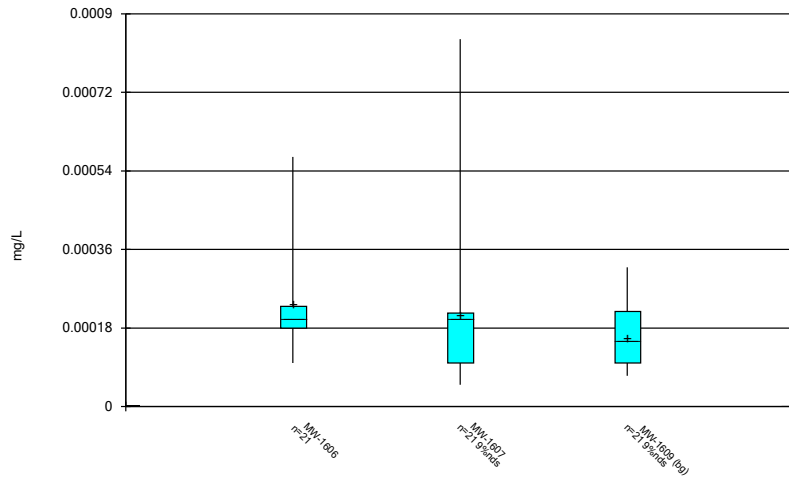
Constituent: Calcium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



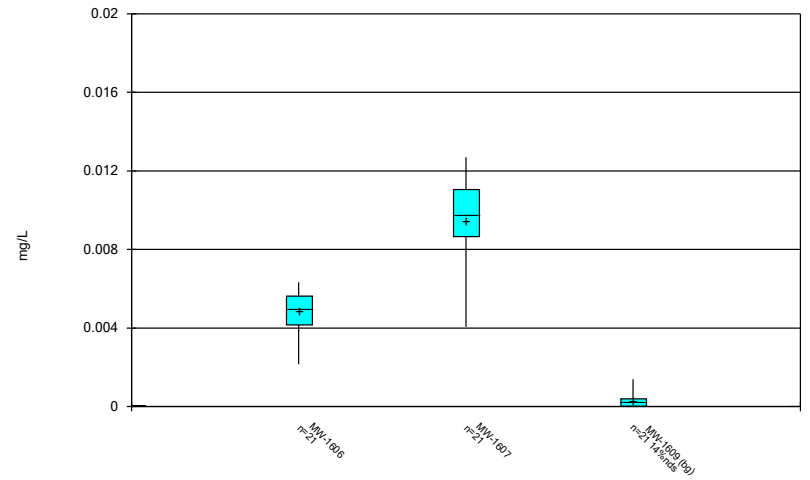
Constituent: Chloride total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



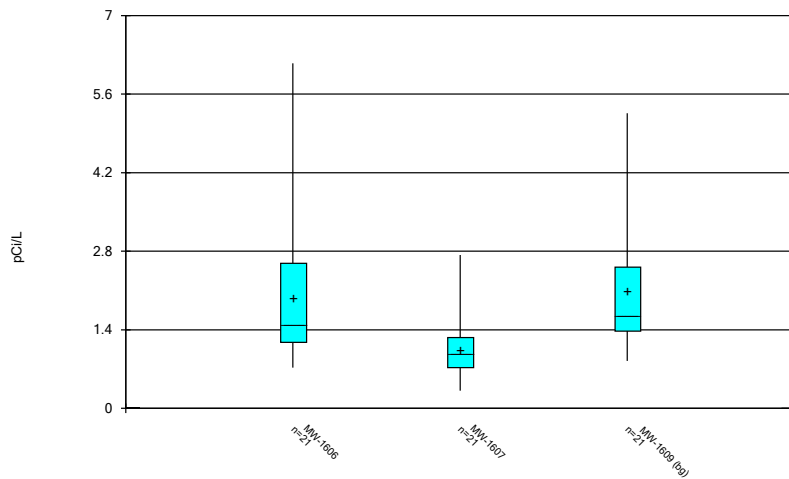
Constituent: Chromium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



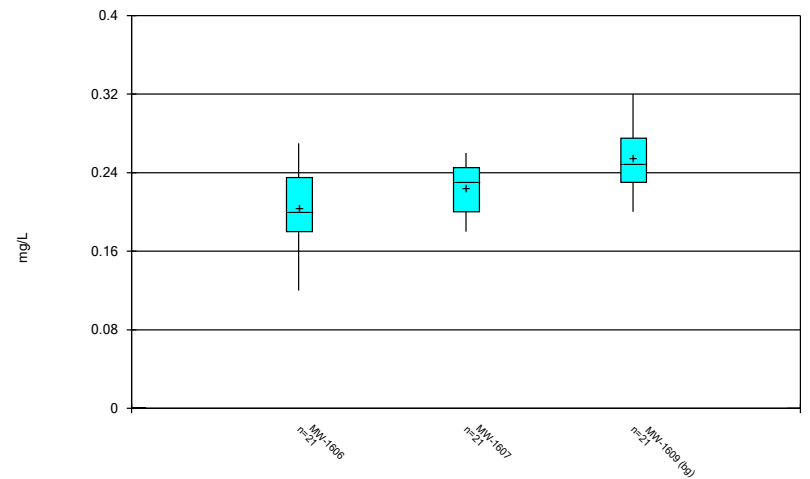
Constituent: Cobalt total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



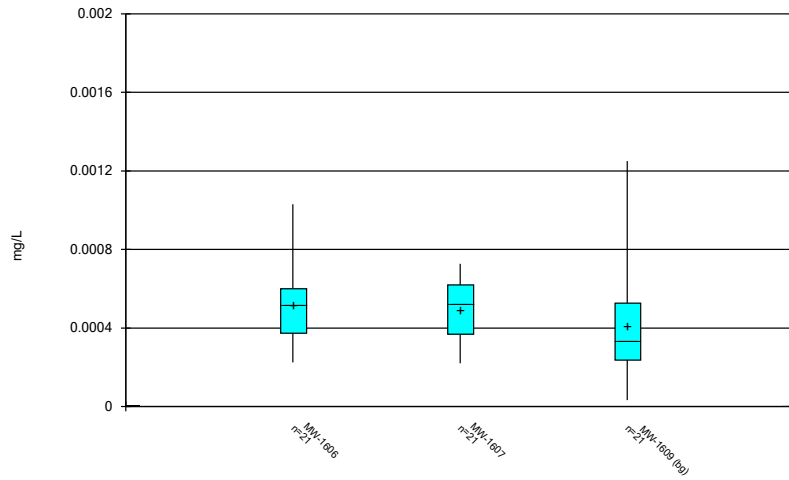
Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - P
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



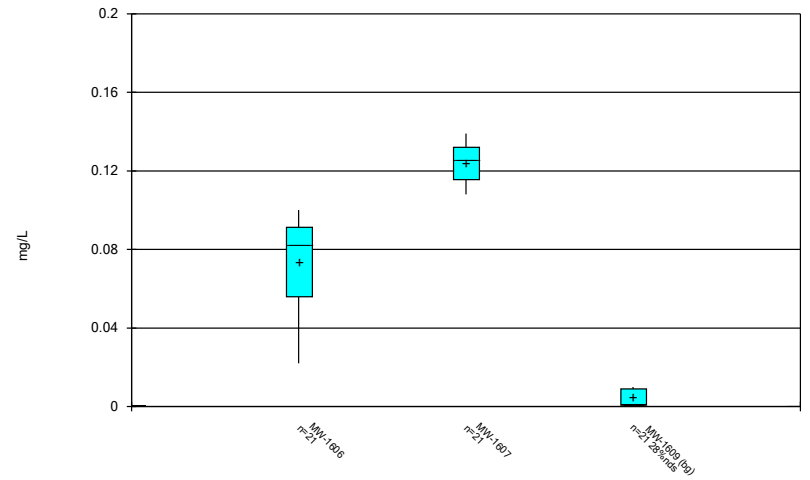
Constituent: Fluoride total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



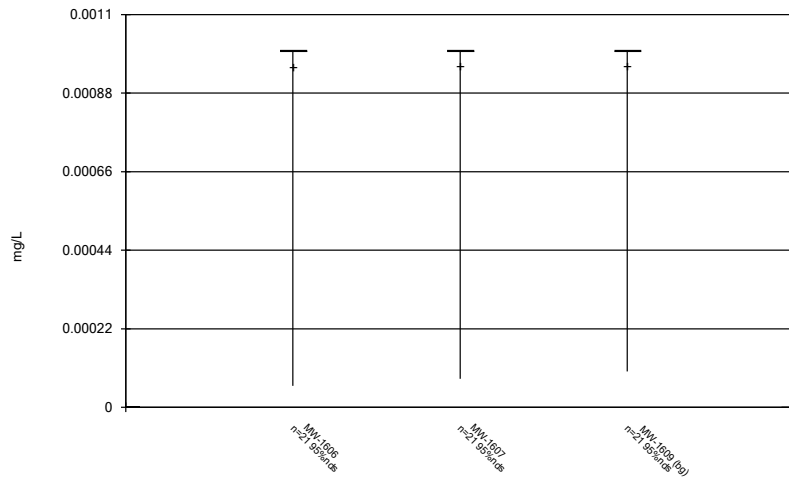
Constituent: Lead total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



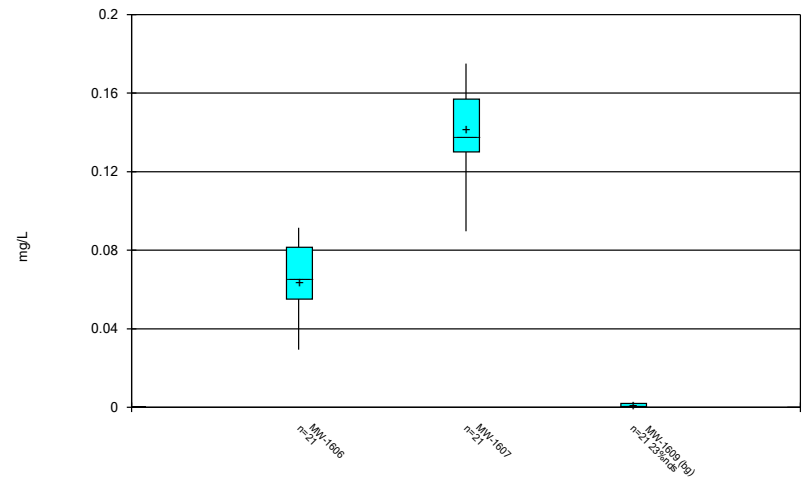
Constituent: Lithium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



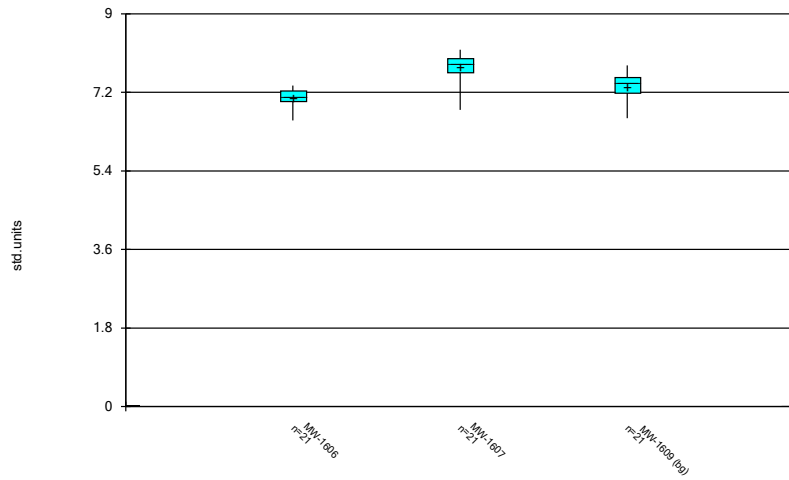
Constituent: Mercury total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



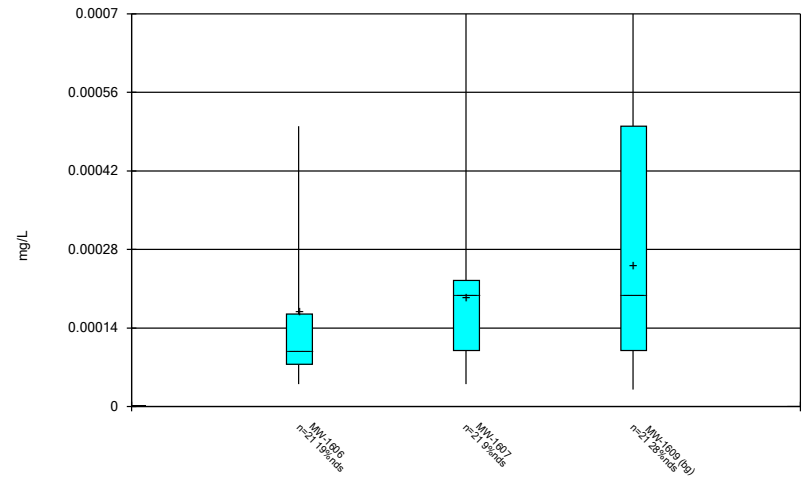
Constituent: Molybdenum total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



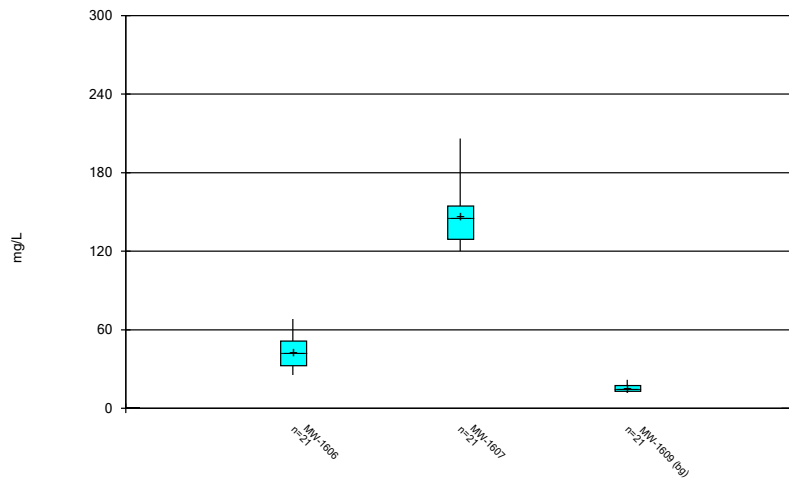
Constituent: pH [field] Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



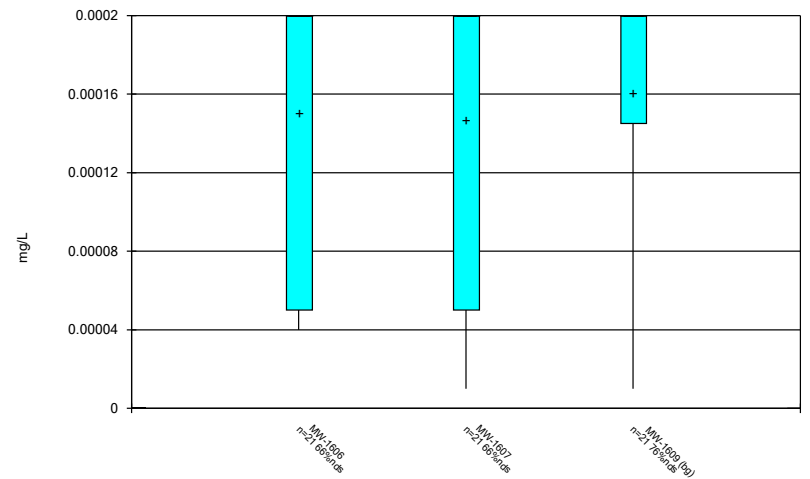
Constituent: Selenium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



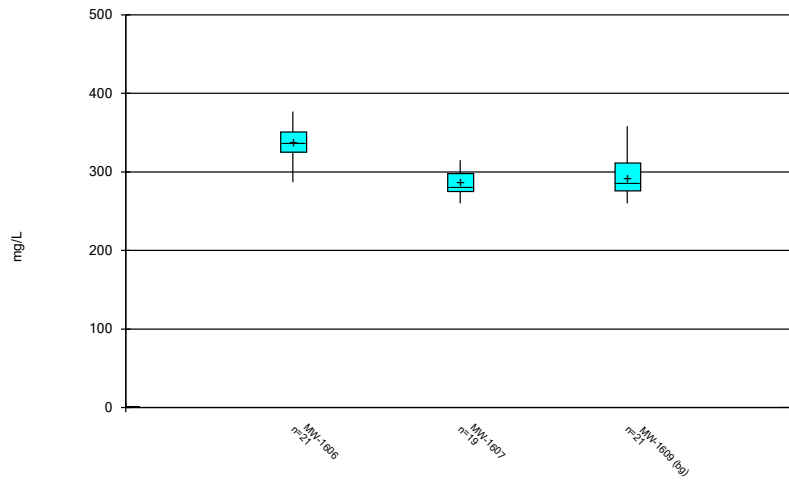
Constituent: Sulfate total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Thallium total Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

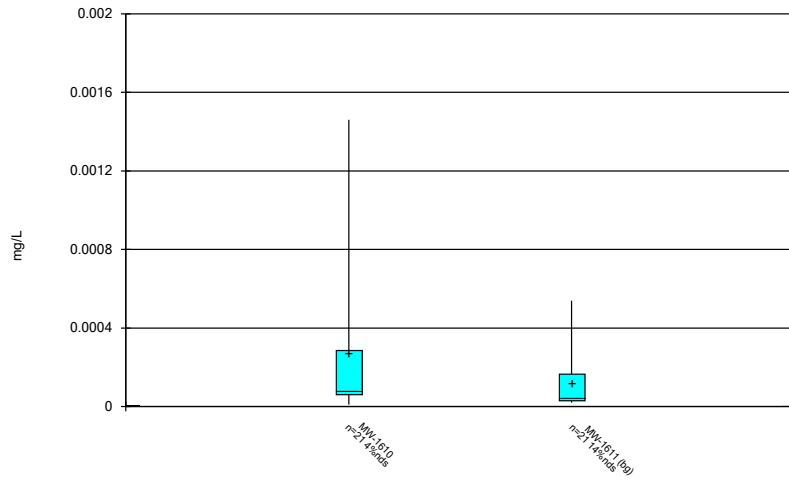
Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:30 PM View: Rome Limestone - Pond 1
Clinch River LF Client: AEP Data: Clinch River

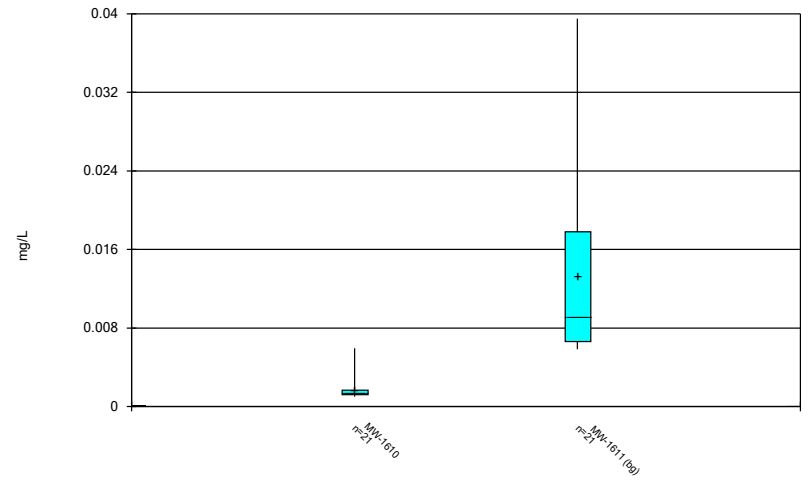
Box Plots - Dumps Fault

Box & Whiskers Plot



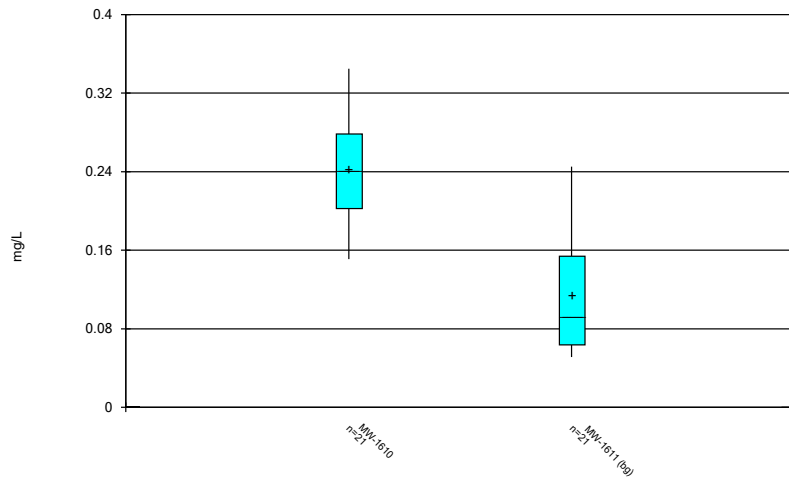
Constituent: Antimony total Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



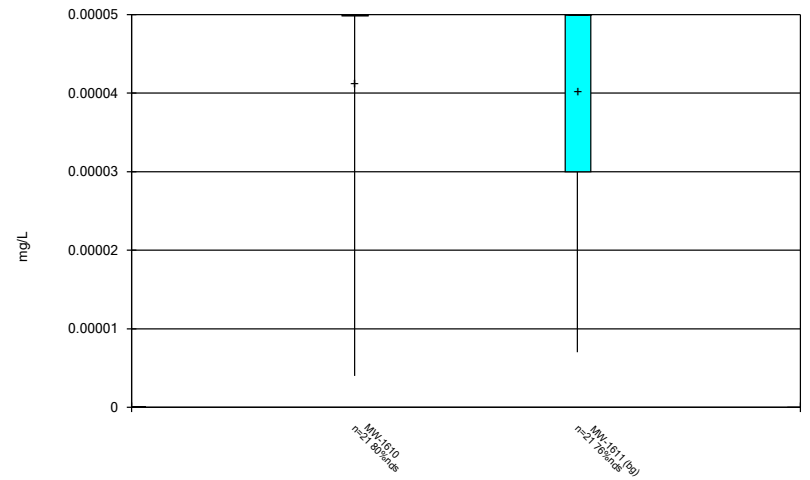
Constituent: Arsenic total Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



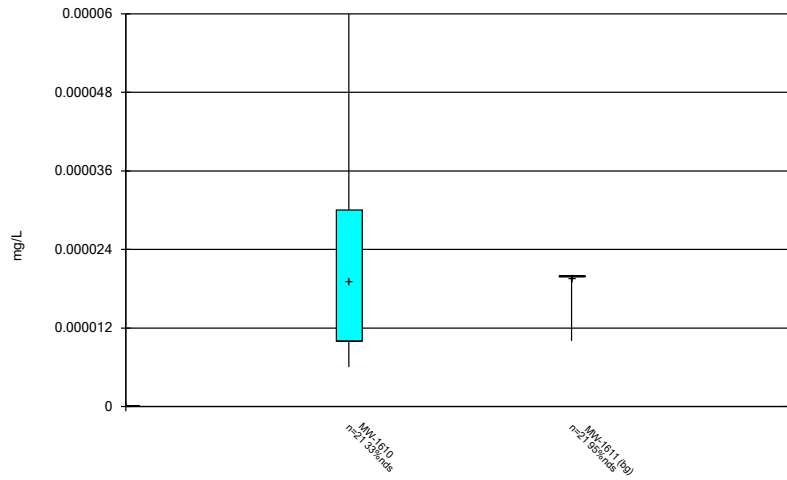
Constituent: Barium total Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



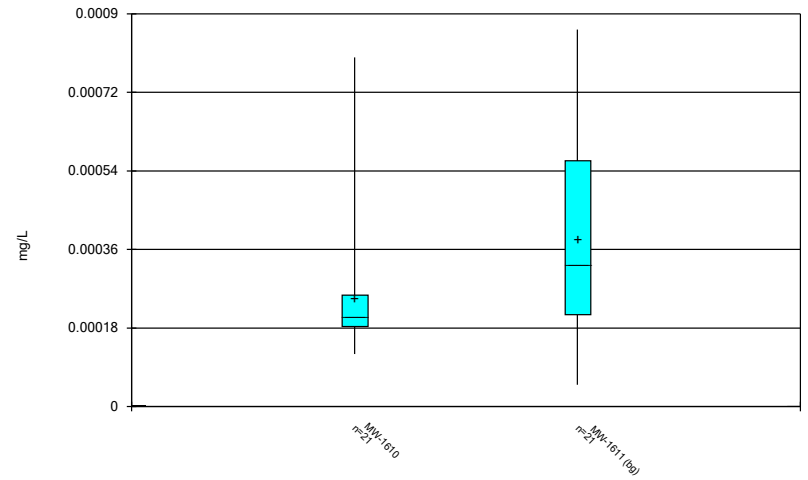
Constituent: Beryllium total Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



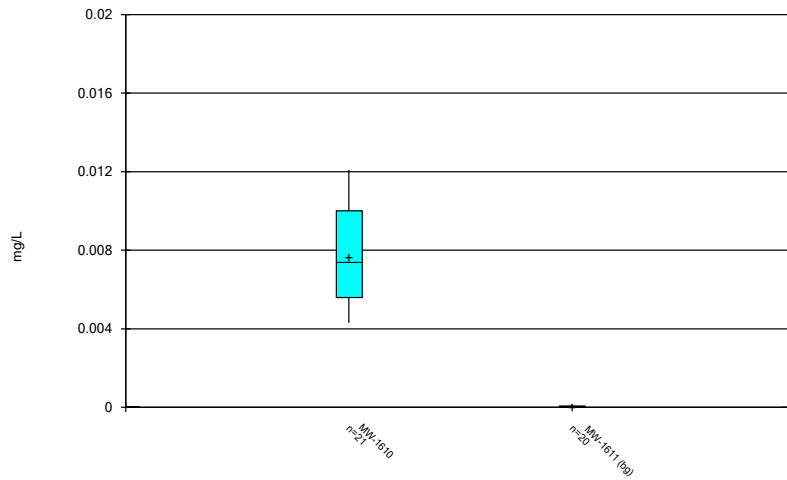
Constituent: Cadmium total Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



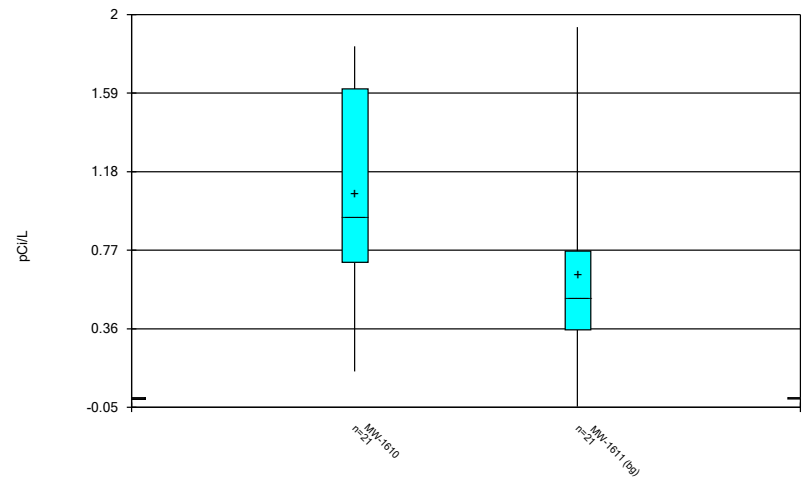
Constituent: Chromium total Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



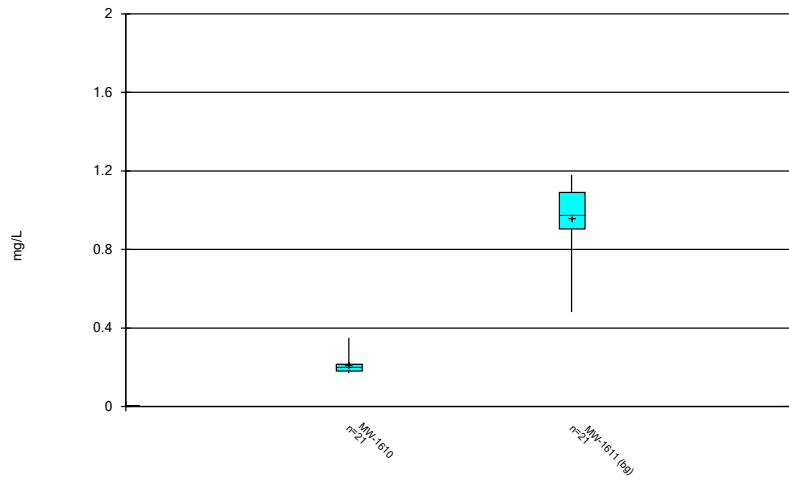
Constituent: Cobalt total Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



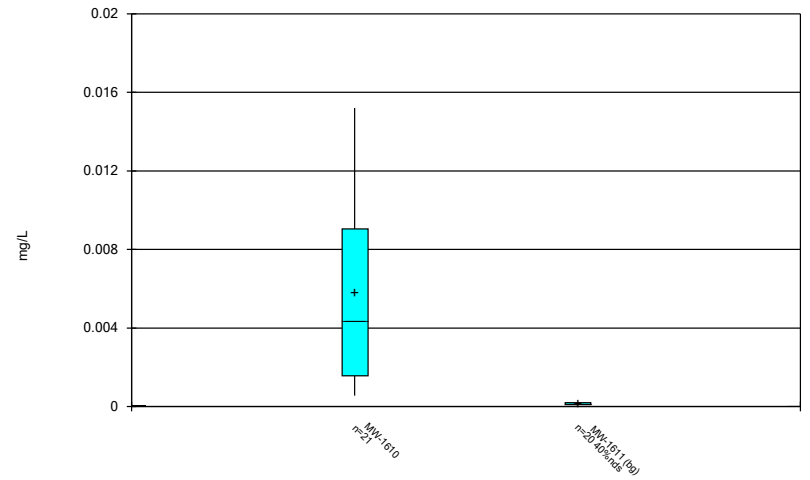
Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 3:46 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



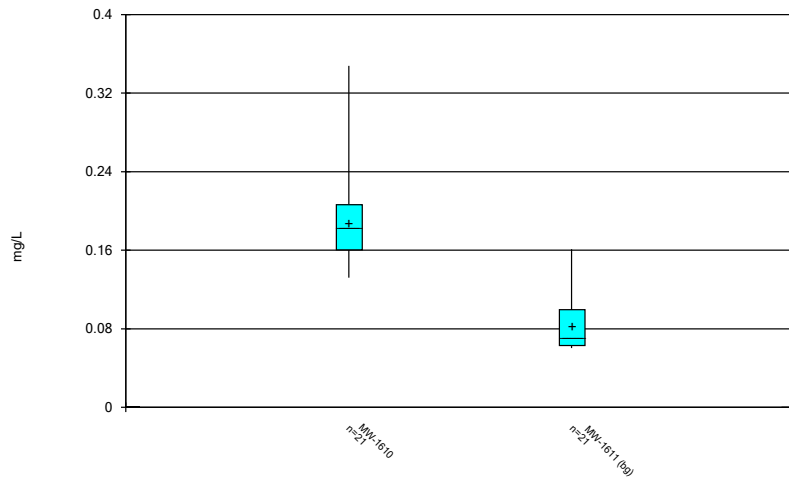
Constituent: Fluoride total Analysis Run 1/24/2023 3:47 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



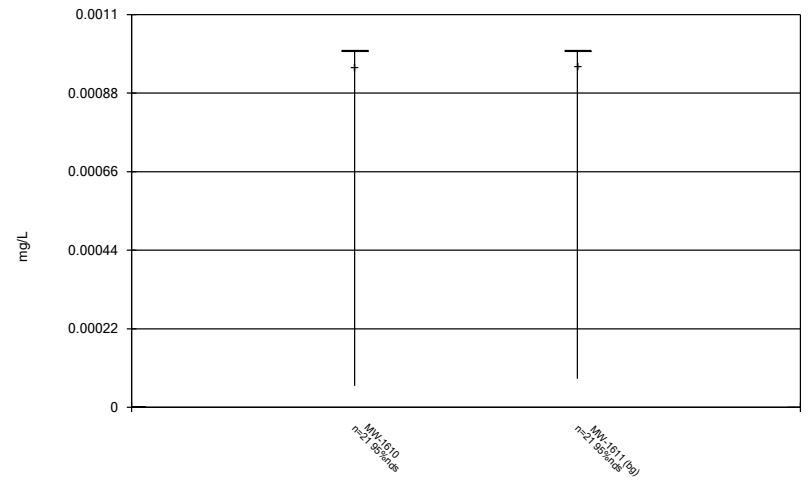
Constituent: Lead total Analysis Run 1/24/2023 3:47 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



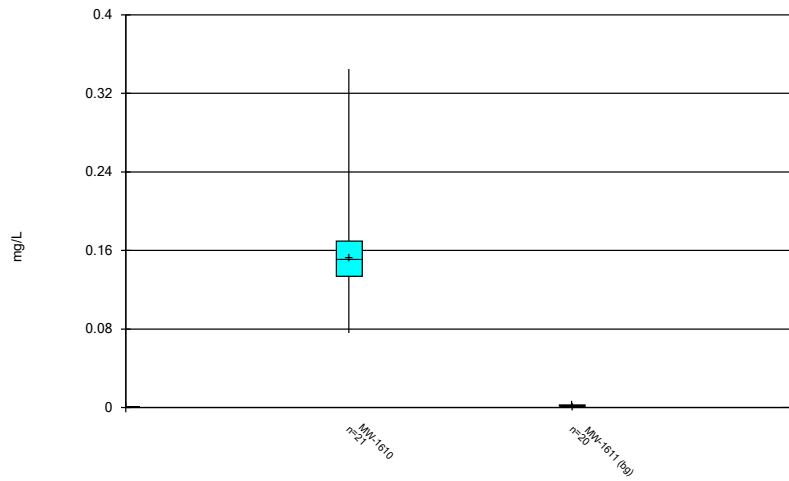
Constituent: Lithium total Analysis Run 1/24/2023 3:47 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



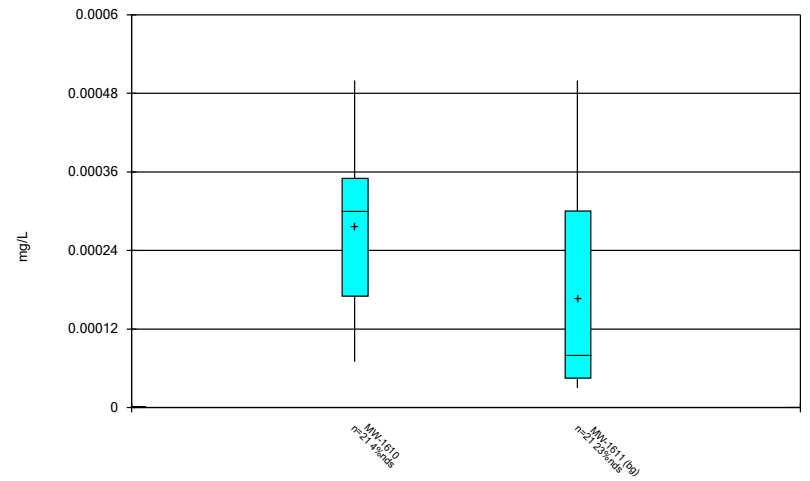
Constituent: Mercury total Analysis Run 1/24/2023 3:47 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



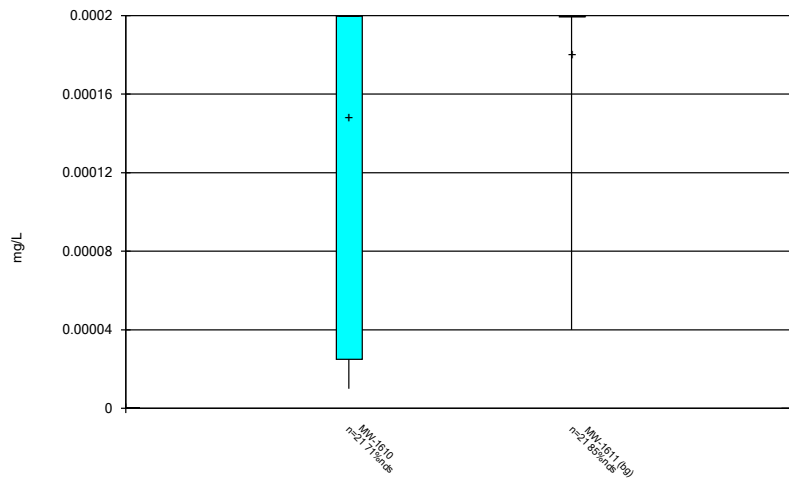
Constituent: Molybdenum total Analysis Run 1/24/2023 3:47 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Selenium total Analysis Run 1/24/2023 3:47 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Thallium total Analysis Run 1/24/2023 3:47 PM View: Dumps Fault - Pond 1
Clinch River LF Client: AEP Data: Clinch River

FIGURE C.

Outlier Summary - Chattanooga Shale

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:24 PM

	MW-1605 Total Dissolved Solids (mg/L)	MW-1612 Total Dissolved Solids (mg/L)
12/13/2017		384 (o)
4/11/2018	1700 (o)	

Outlier Summary - Rome Limestone

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:30 PM

MW-1607 Total Dissolved Solids (mg/L)

10/18/2017	468 (o)
12/12/2017	417 (o)

Outlier Summary - Dumps Fault

Clinch River LF Client: AEP Data: Clinch River Printed 1/13/2023, 4:09 PM

	MW-1611 Cobalt total (mg/L)	MW-1611 Lead total (mg/L)	MW-1611 Molybdenum total (mg/L)
10/19/2017	0.000311 (o)	0.00105 (o)	0.038 (o)

Tukey's Outlier Test - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:45 PM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Total Dissolved Solids (mg/L)	MW-1605	Yes	1700	NP	NaN	21	790.7	220.4	In(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1612	Yes	384	NP	NaN	20	520.4	35.58	x^6	ShapiroWilk

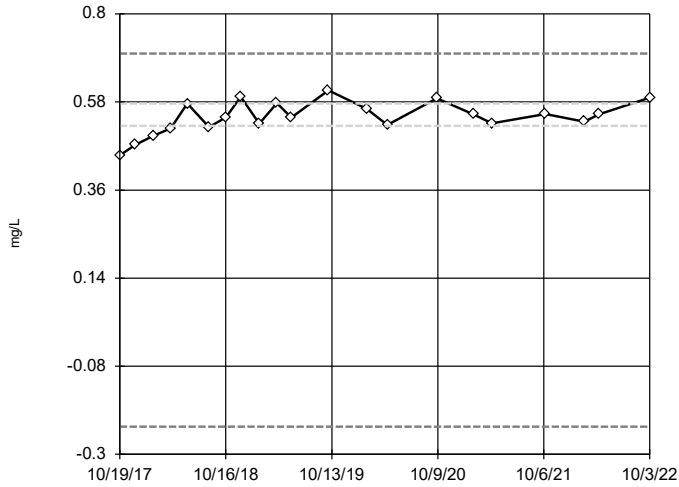
Tukey's Outlier Test - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:45 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron total (mg/L)	MW-1601 (bg)	No	n/a	NP	NaN	21	0.542	0.04059	x^3	ShapiroWilk
Boron total (mg/L)	MW-1602 (bg)	No	n/a	NP	NaN	21	0.615	0.03083	x^2	ShapiroWilk
Boron total (mg/L)	MW-1603	No	n/a	NP	NaN	21	0.2819	0.08471	ln(x)	ShapiroWilk
Boron total (mg/L)	MW-1604	No	n/a	NP	NaN	21	0.4187	0.0366	x^2	ShapiroWilk
Boron total (mg/L)	MW-1605	No	n/a	NP	NaN	21	0.567	0.03907	ln(x)	ShapiroWilk
Boron total (mg/L)	MW-1608 (bg)	No	n/a	NP	NaN	21	0.3504	0.02038	x^(1/3)	ShapiroWilk
Boron total (mg/L)	MW-1612	No	n/a	NP	NaN	20	0.426	0.06197	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1601 (bg)	No	n/a	NP	NaN	21	2.163	0.1952	x^6	ShapiroWilk
Fluoride total (mg/L)	MW-1602 (bg)	No	n/a	NP	NaN	21	1.636	0.08207	x^2	ShapiroWilk
Fluoride total (mg/L)	MW-1603	No	n/a	NP	NaN	21	0.1252	0.0262	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1604	No	n/a	NP	NaN	21	0.2624	0.04538	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1605	No	n/a	NP	NaN	21	0.3514	0.03454	normal	ShapiroWilk
Fluoride total (mg/L)	MW-1608 (bg)	No	n/a	NP	NaN	21	0.4252	0.02442	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1612	No	n/a	NP	NaN	20	0.166	0.03455	x^2	ShapiroWilk
Sulfate total (mg/L)	MW-1601 (bg)	No	n/a	NP	NaN	21	219.1	57.09	ln(x)	ShapiroWilk
Sulfate total (mg/L)	MW-1602 (bg)	No	n/a	NP	NaN	21	24.47	6.572	sqrt(x)	ShapiroWilk
Sulfate total (mg/L)	MW-1603	No	n/a	NP	NaN	21	13.09	14.51	x^(1/3)	ShapiroWilk
Sulfate total (mg/L)	MW-1604	No	n/a	NP	NaN	21	2.568	2.421	x^(1/3)	ShapiroWilk
Sulfate total (mg/L)	MW-1605	No	n/a	NP	NaN	21	46.35	43.88	normal	ShapiroWilk
Sulfate total (mg/L)	MW-1608 (bg)	No	n/a	NP	NaN	21	170.5	6.653	ln(x)	ShapiroWilk
Sulfate total (mg/L)	MW-1612	No	n/a	NP	NaN	20	4.98	5.589	x^(1/3)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1601 (bg)	No	n/a	NP	NaN	21	1433	124.2	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1602 (bg)	No	n/a	NP	NaN	21	524.6	18.78	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1603	No	n/a	NP	NaN	21	520.8	129.7	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1604	No	n/a	NP	NaN	21	396	15.82	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1605	Yes	1700	NP	NaN	21	790.7	220.4	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1608 (bg)	No	n/a	NP	NaN	21	443	18.67	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1612	Yes	384	NP	NaN	20	520.4	35.58	x^6	ShapiroWilk

Tukey's Outlier Screening

MW-1601 (bg)

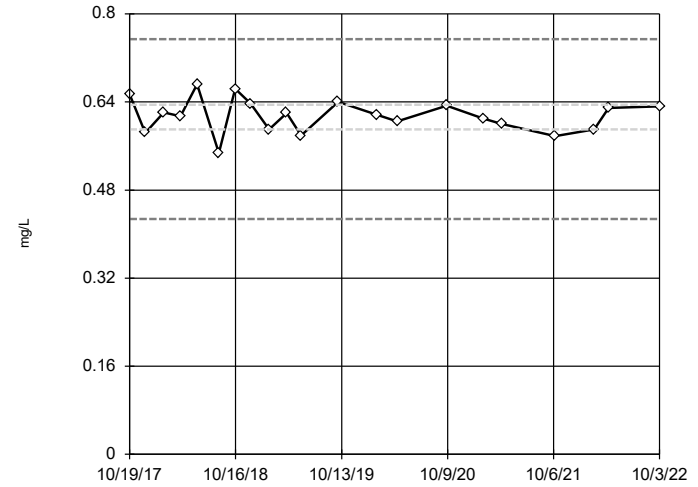


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were cube transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.701, low cutoff = -0.2309, based on IQR multiplier of 3.

Constituent: Boron total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1602 (bg)

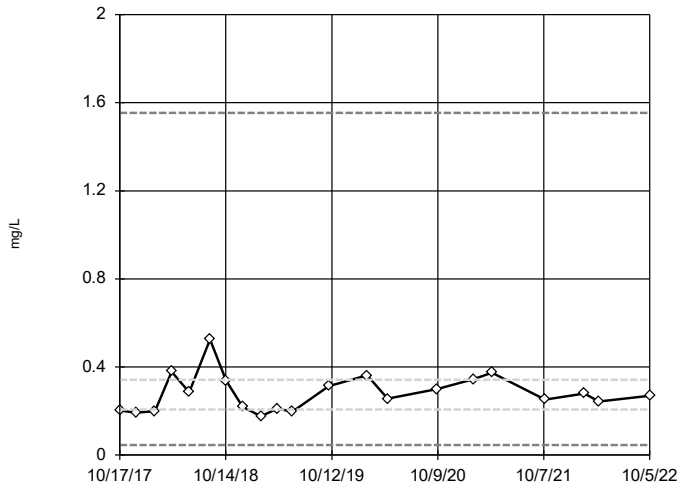


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.7541, low cutoff = 0.4274, based on IQR multiplier of 3.

Constituent: Boron total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1603

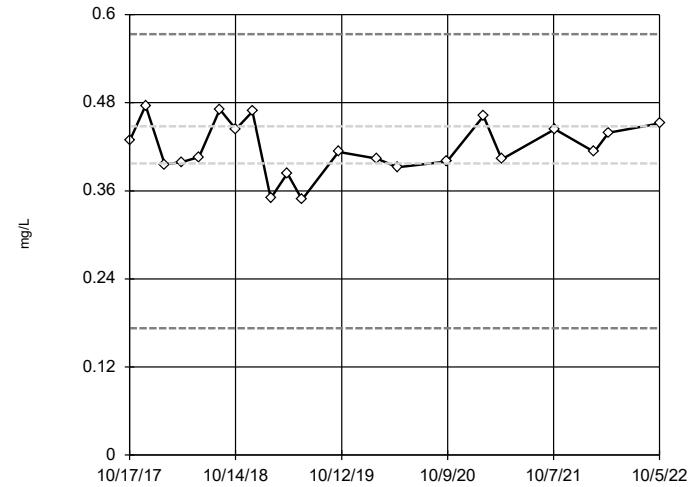


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1.554, low cutoff = 0.04542, based on IQR multiplier of 3.

Constituent: Boron total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1604

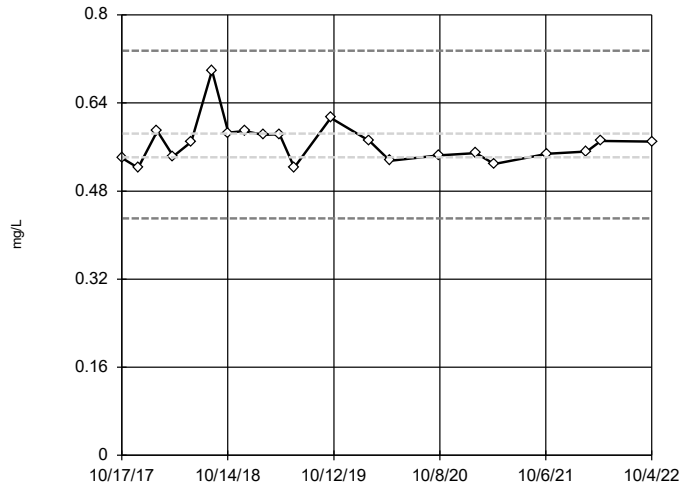


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.5735, low cutoff = 0.1728, based on IQR multiplier of 3.

Constituent: Boron total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1605

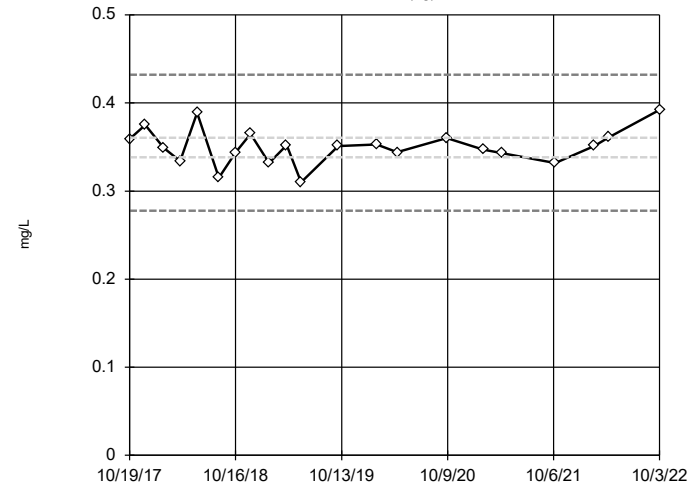


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.7351,
 low cutoff = 0.4306, based on IQR multiplier of 3.

Constituent: Boron total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

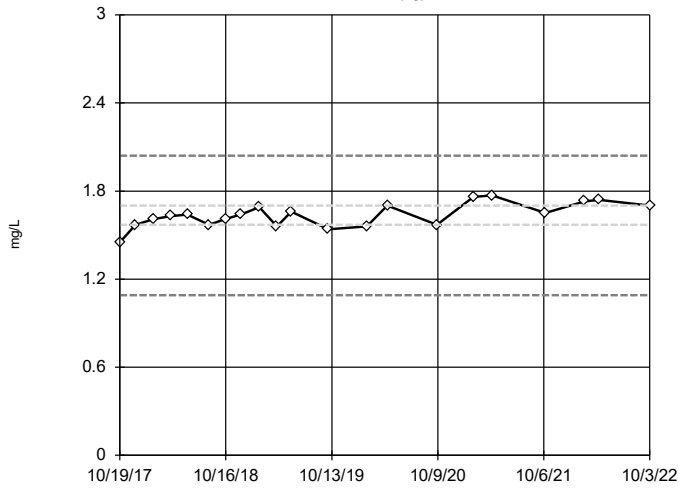
Tukey's Outlier Screening

MW-1608 (bg)



Tukey's Outlier Screening

MW-1602 (bg)

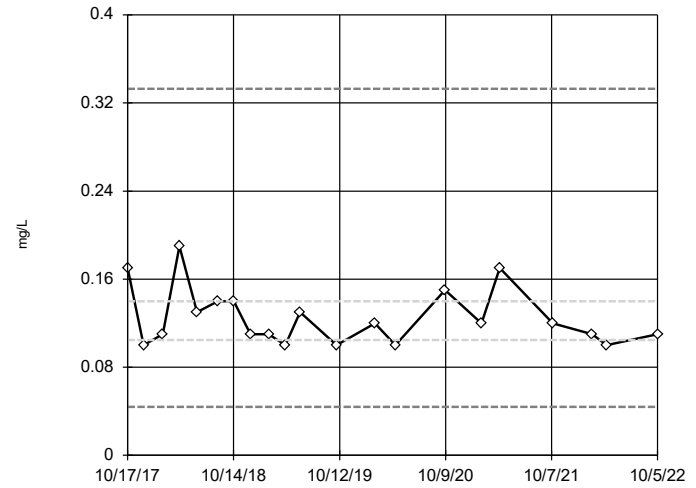


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 2.041, low cutoff = 1.091, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1603

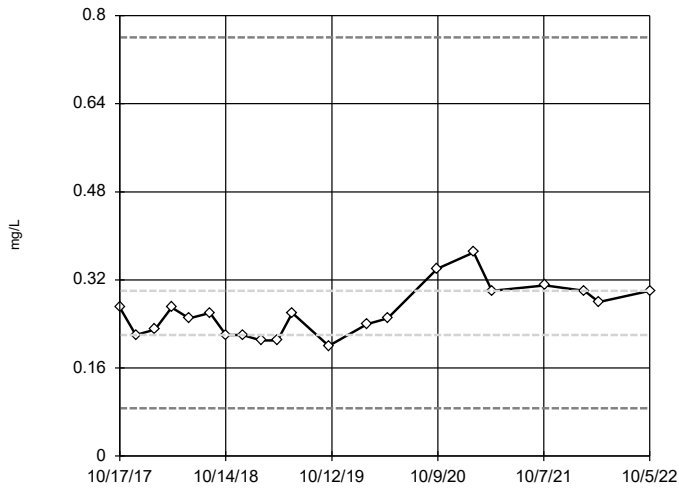


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.333, low cutoff = 0.0441, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1604

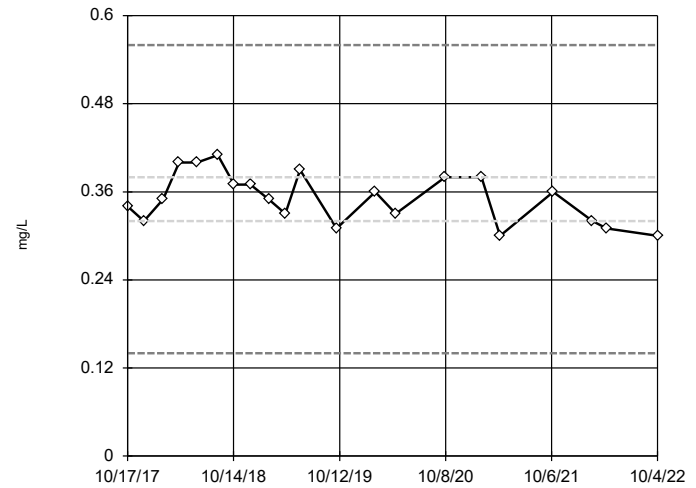


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.7607, low cutoff = 0.08676, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1605

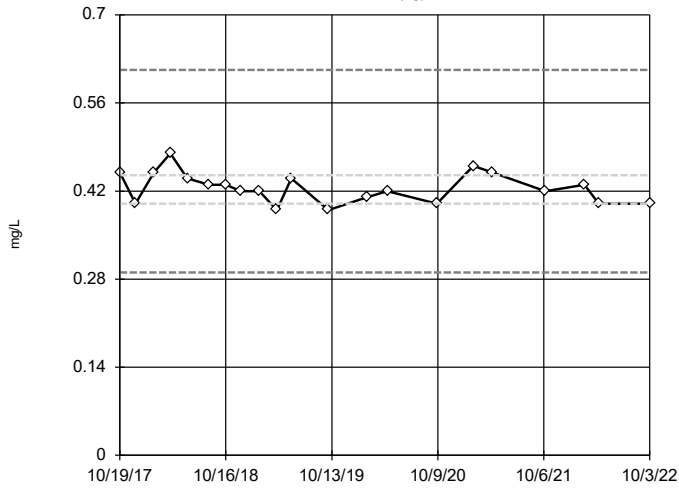


n = 21
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 0.56, low cutoff = 0.14, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1608 (bg)

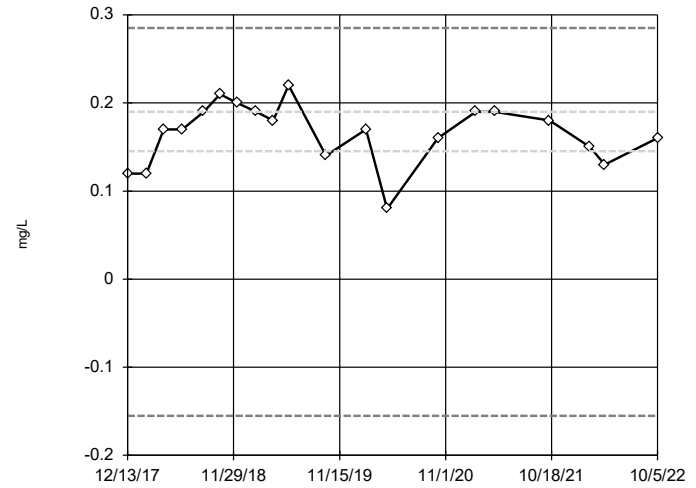


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.6126, low cutoff = 0.2906, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1612

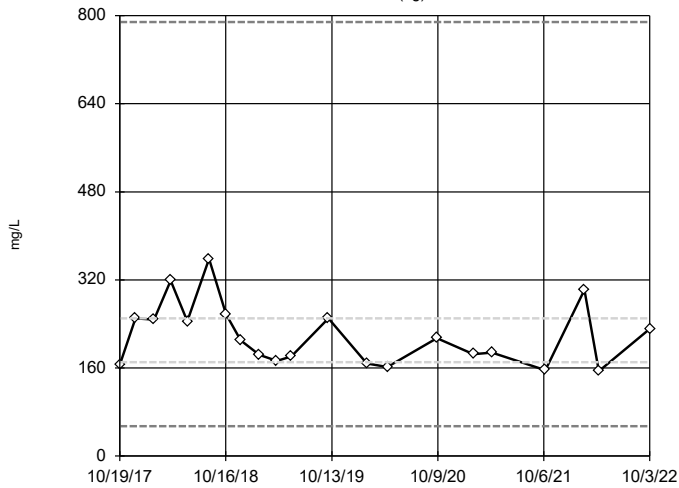


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.285, low cutoff = -0.1552, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1601 (bg)

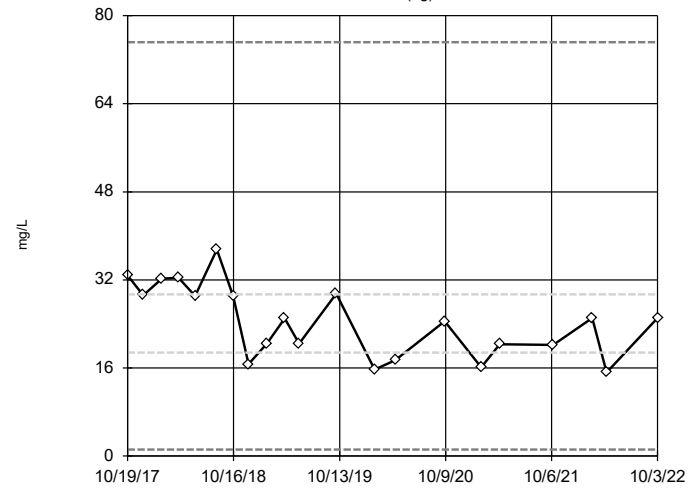


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 788.4, low cutoff = 54.06, based on IQR multiplier of 3.

Constituent: Sulfate total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1602 (bg)

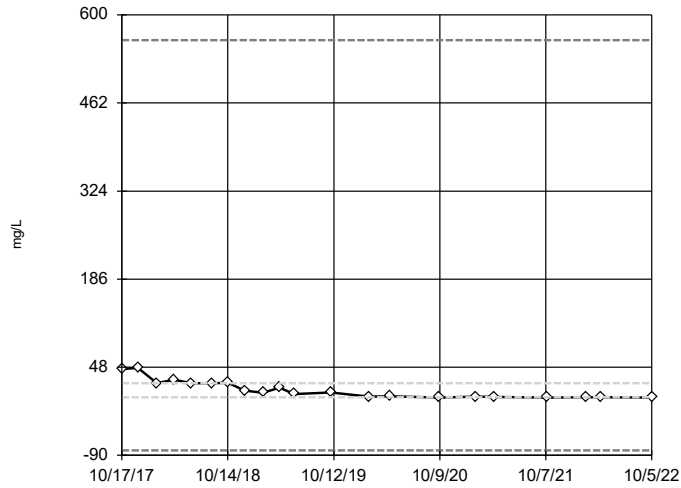


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 75.2, low cutoff = 1.164, based on IQR multiplier of 3.

Constituent: Sulfate total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1603



Constituent: Sulfate total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

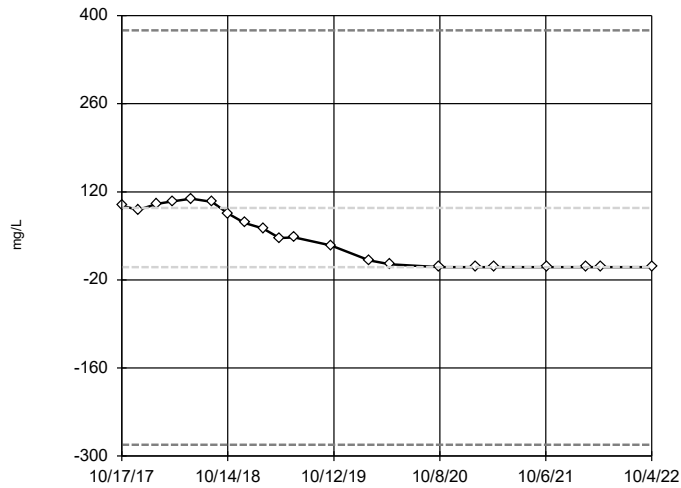
MW-1604



Constituent: Sulfate total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

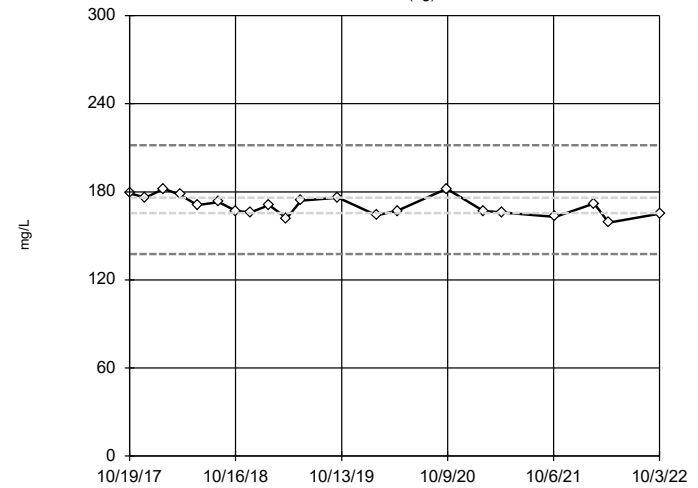
MW-1605



Constituent: Sulfate total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

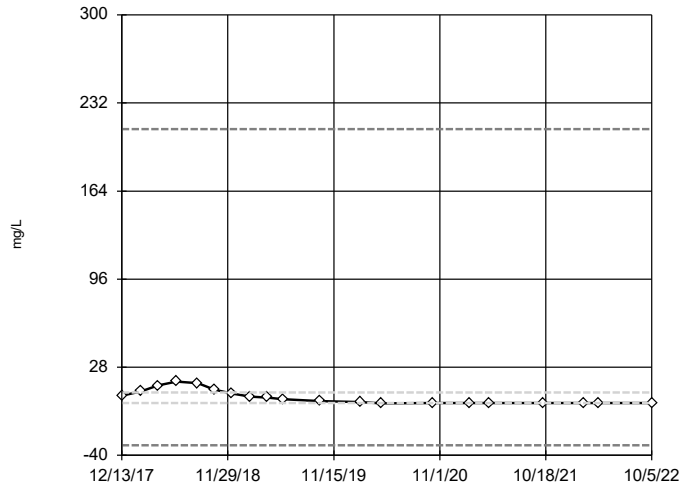
MW-1608 (bg)



Constituent: Sulfate total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1612

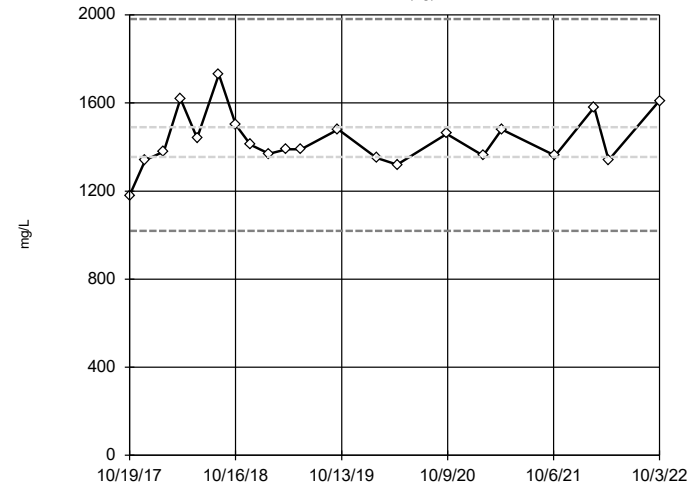


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 211.9, low cutoff = -32.22, based on IQR multiplier of 3.

Constituent: Sulfate total Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1601 (bg)

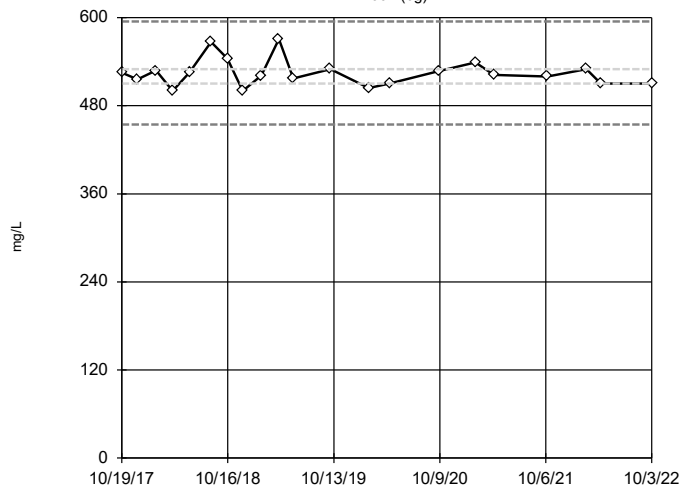


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1981, low cutoff = 1019, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1602 (bg)

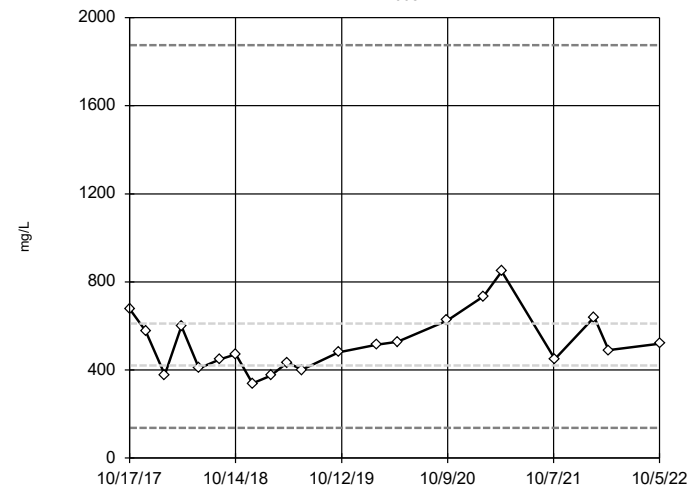


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 594.8, low cutoff = 454.4, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1603

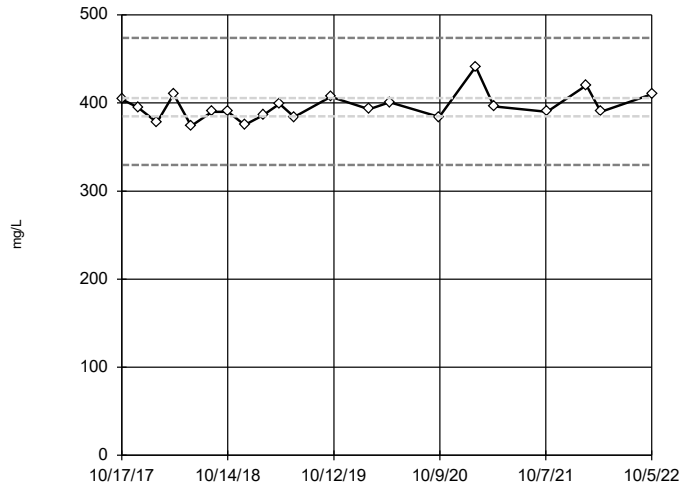


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1875, low cutoff = 137.2, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1604

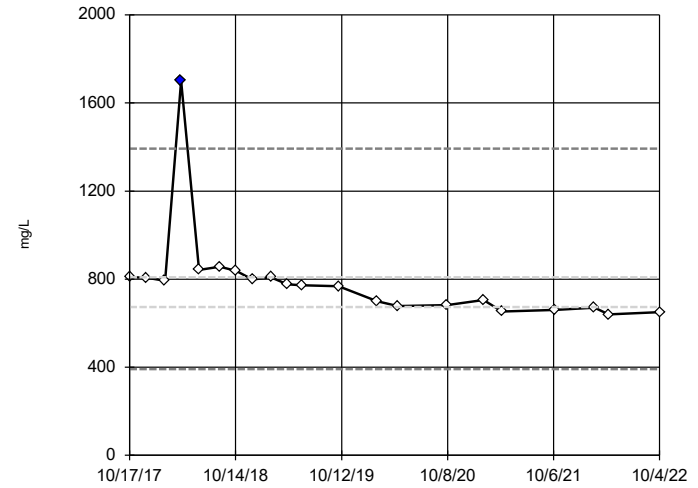


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 473.8, low cutoff = 329.5, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1605

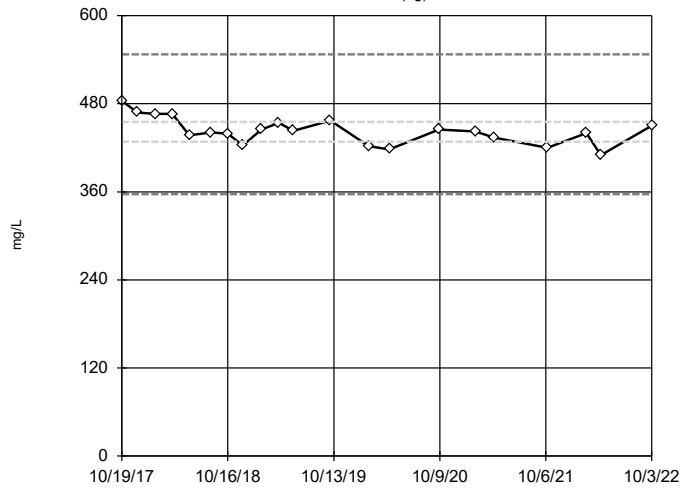


n = 21
 Outlier is drawn as solid. Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1392, low cutoff = 391.2, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1608 (bg)

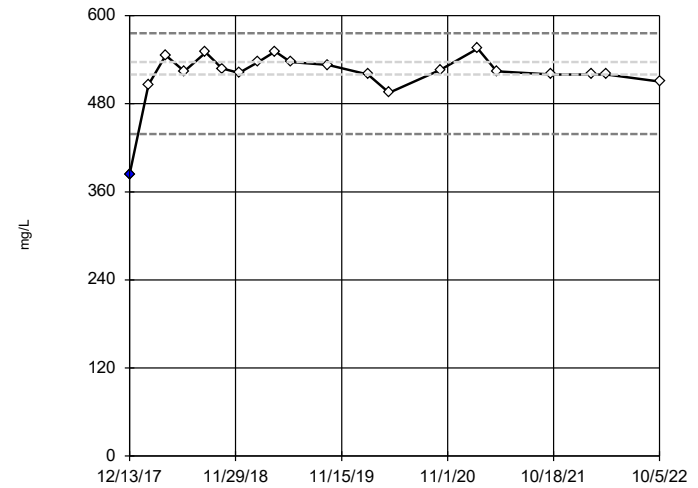


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 547.3, low cutoff = 356.6, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1612



n = 20
 Outlier is drawn as solid. Tukey's method selected by user.
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 576.2, low cutoff = 438.8, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:44 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

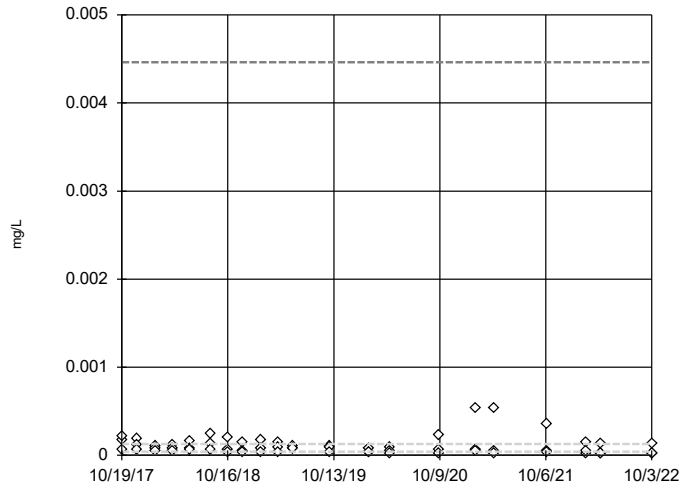
Tukey's Outlier Test - Upgradient Wells (Chattanooga) - All Results (No Significant)

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:06 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.0001024	0.0001033	ln(x)	ShapiroFrancia
Arsenic total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.005574	0.00662	ln(x)	ShapiroFrancia
Barium total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.1146	0.07747	x^(1/3)	ShapiroFrancia
Beryllium total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.00004041	0.00001756	x^2	ShapiroFrancia
Cadmium total (mg/L)	MW-1601,MW-1602,M..n/a		n/a	NP	NaN	63	0.00001913	0.000003854	unknown	ShapiroFrancia
Calcium total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	3.458	2.108	normal	ShapiroFrancia
Chloride total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	12.7	11.08	ln(x)	ShapiroFrancia
Chromium total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.0003488	0.0002781	ln(x)	ShapiroFrancia
Cobalt total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.0001204	0.0001074	ln(x)	ShapiroFrancia
Combined Radium 226 and 228 (pCi/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.8817	0.7088	x^(1/3)	ShapiroFrancia
Fluoride total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	1.408	0.7432	x^2	ShapiroFrancia
Lead total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.0001832	0.0001529	ln(x)	ShapiroFrancia
Lithium total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.05318	0.03405	x^(1/3)	ShapiroFrancia
Mercury total (mg/L)	MW-1601,MW-1602,M..n/a		n/a	NP	NaN	63	0.0008976	0.000292	unknown	ShapiroFrancia
Molybdenum total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.003709	0.004448	ln(x)	ShapiroFrancia
pH [field] (std.units)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	8.448	0.333	x^6	ShapiroFrancia
Selenium total (mg/L)	MW-1601,MW-1602,M..No		n/a	NP	NaN	63	0.0002762	0.0002225	ln(x)	ShapiroFrancia
Thallium total (mg/L)	MW-1601,MW-1602,M..n/a		n/a	NP	NaN	63	0.00016	0.00007554	unknown	ShapiroFrancia

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

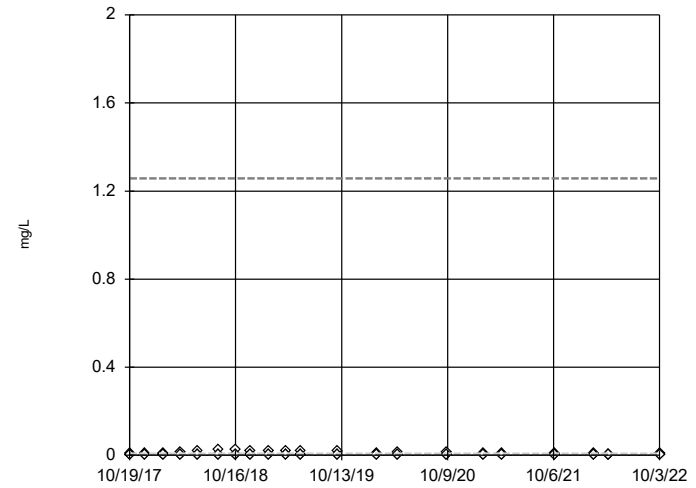


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.004463, low cutoff = 0.00001165, based on IQR multiplier of 3.

Constituent: Antimony total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradi
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

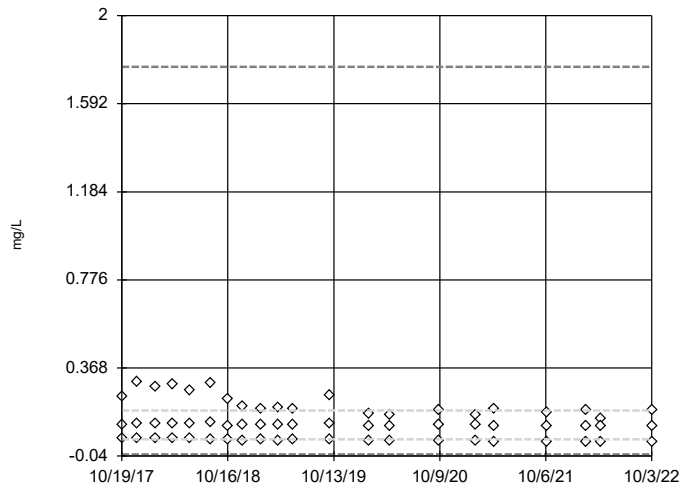


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1.258, low cutoff = 0.000009181, based on IQR multiplier of 3.

Constituent: Arsenic total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradien
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

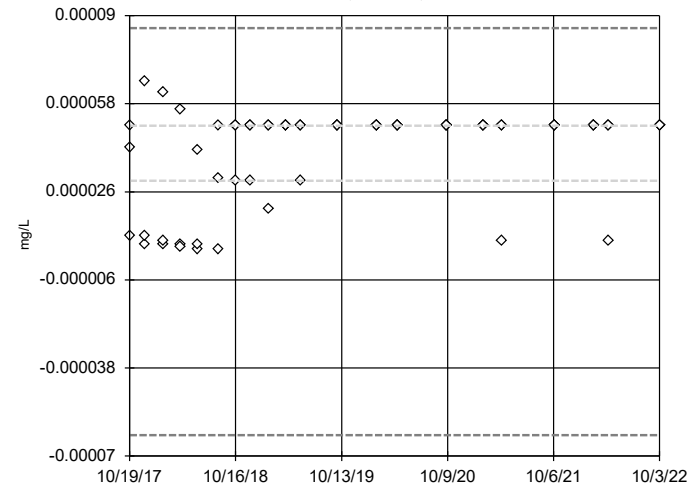


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1.763, low cutoff = -0.03145, based on IQR multiplier of 3.

Constituent: Barium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradien
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

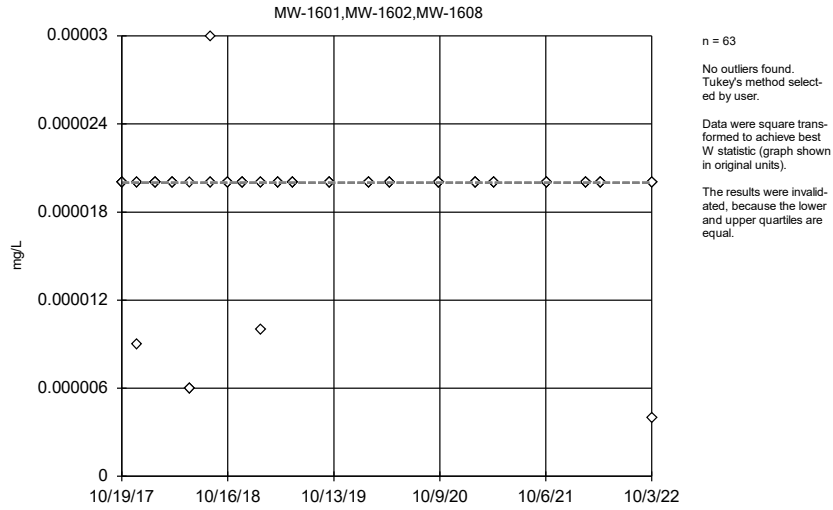
MW-1601,MW-1602,MW-1608



n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.00008544, low cutoff = -0.00006245, based on IQR multiplier of 3.

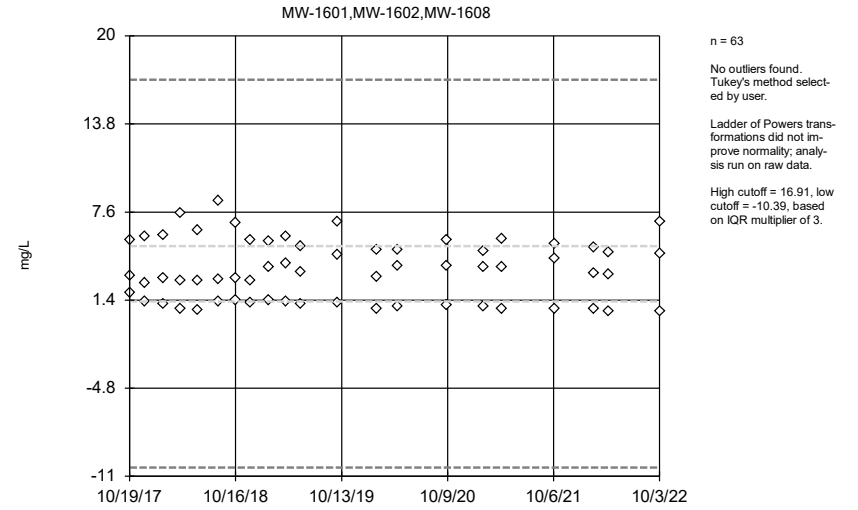
Constituent: Beryllium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradi
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background



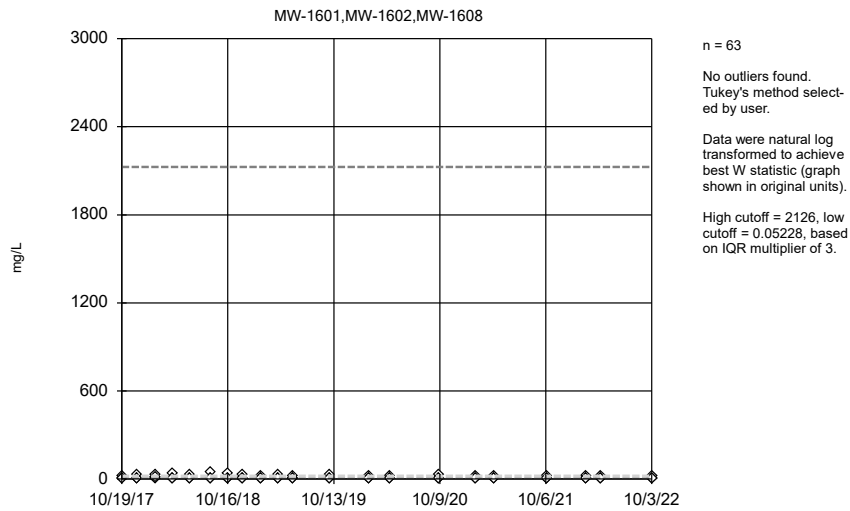
Constituent: Cadmium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradie
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background



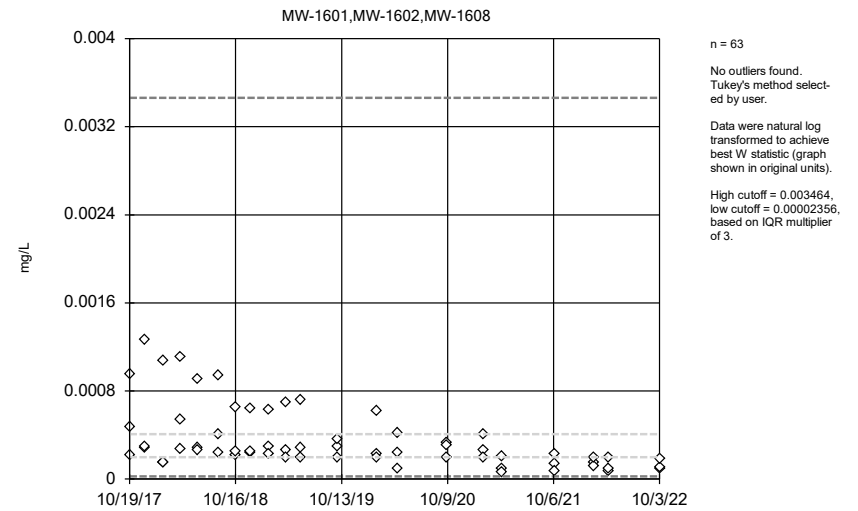
Constituent: Calcium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradie
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background



Constituent: Chloride total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradie
Clinch River LF Client: AEP Data: Clinch River

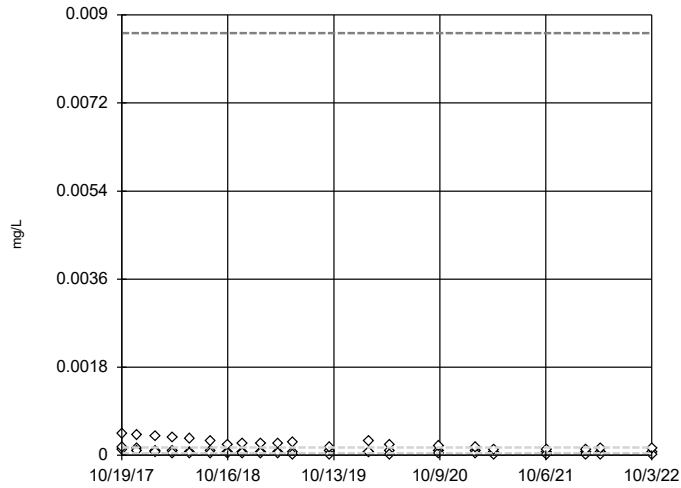
Tukey's Outlier Screening, Pooled Background



Constituent: Chromium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradie
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

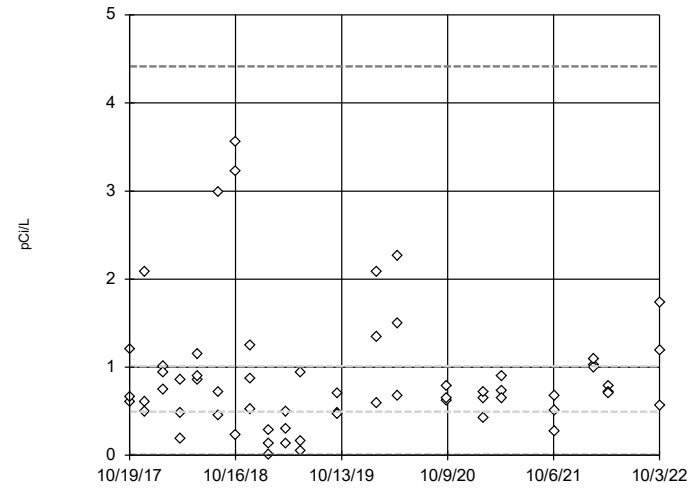


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.008627, low cutoff = 7.7e-7, based on IQR multiplier of 3.

Constituent: Cobalt total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

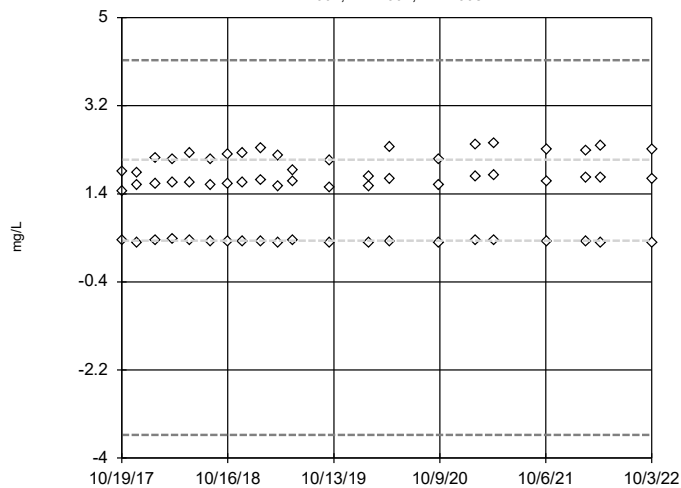


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 4.415, low cutoff = 0.003637, based on IQR multiplier of 3.

Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

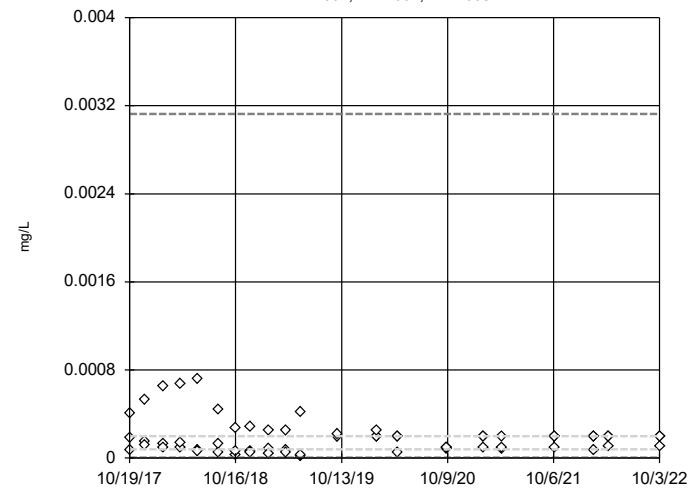


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 4.13, low cutoff = -3.529, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradie
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

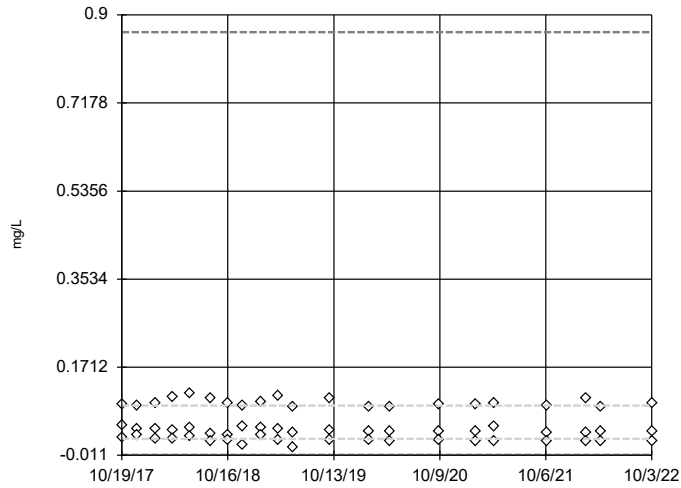


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.003125, low cutoff = 0.00000512, based on IQR multiplier of 3.

Constituent: Lead total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

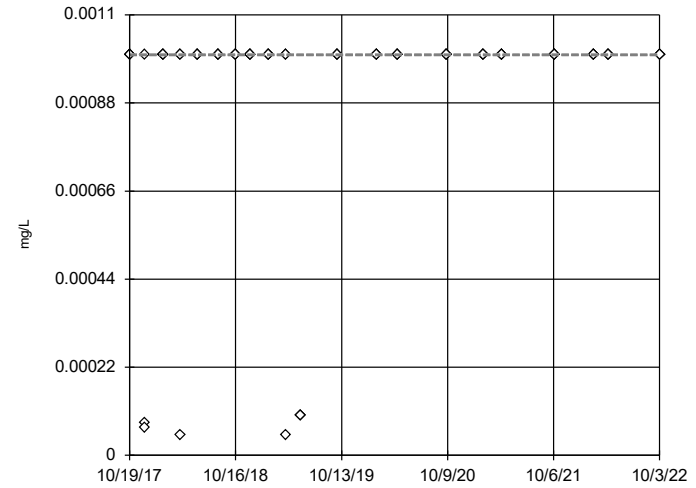


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.8644,
 low cutoff = -0.01018,
 based on IQR multiplier of 3.

Constituent: Lithium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

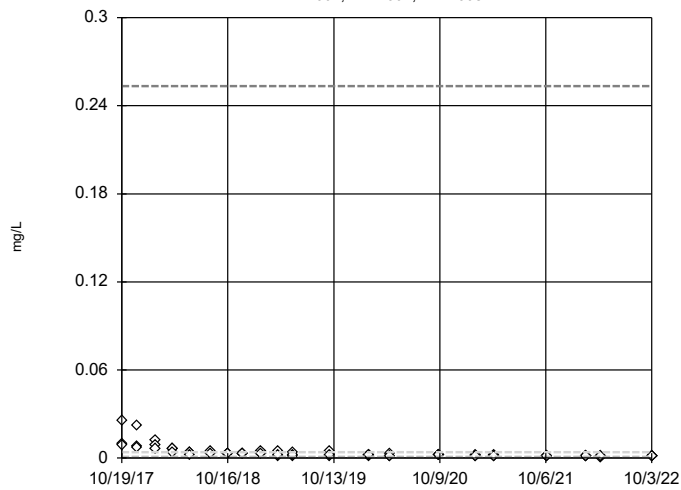


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

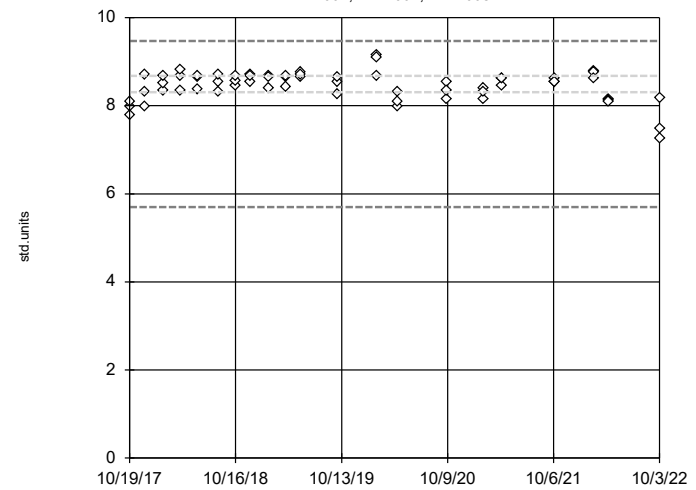


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.2534,
 low cutoff = 0.00001574,
 based on IQR multiplier of 3.

Constituent: Molybdenum total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgr
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

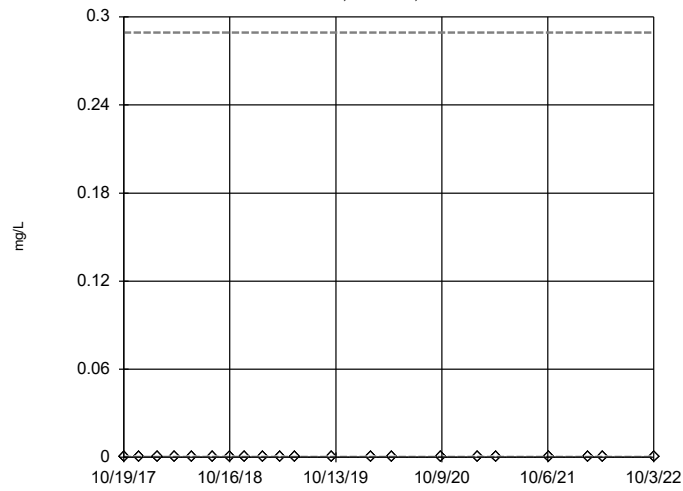


n = 63
 No outliers found.
 Tukey's method selected by user.
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 9.473,
 low cutoff = 5.697,
 based on IQR multiplier of 3.

Constituent: pH [field] Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradient O
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

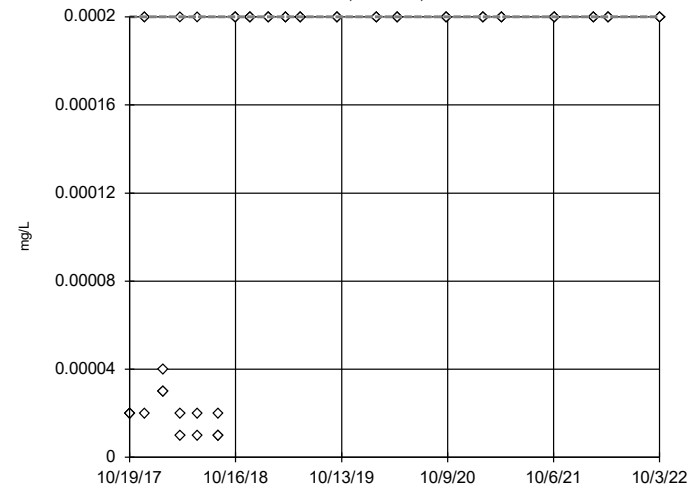
MW-1601,MW-1602,MW-1608



Constituent: Selenium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradi
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608



Constituent: Thallium total Analysis Run 1/24/2023 12:04 PM View: Chattanooga Shale - Pond 1 Upgradi
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Test - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:23 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron total (mg/L)	MW-1609 (bg)	Yes	0.017,0.084,0.084,0.077,0.117,0.01,0.014	NP	NaN	21	0.05162	0.02413	sqrt(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1607	Yes	468,417	NP	NaN	21	300.9	49.68	ln(x)	ShapiroWilk

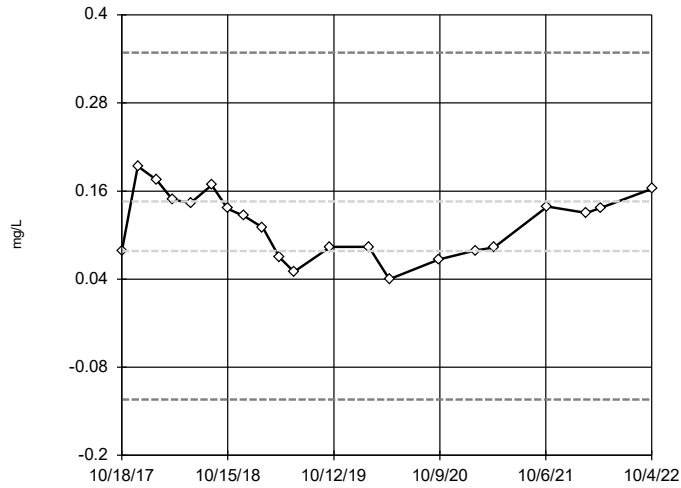
Tukey's Outlier Test - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:23 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron total (mg/L)	MW-1606	No	n/a	NP	NaN	21	0.1145	0.0439	normal	ShapiroWilk
Boron total (mg/L)	MW-1607	No	n/a	NP	NaN	21	0.1228	0.02556	ln(x)	ShapiroWilk
Boron total (mg/L)	MW-1609 (bg)	Yes	0.017,0.084,0.084,0.077,0.117,0.01,0.014	NP	NaN	21	0.05162	0.02413	sqrt(x)	ShapiroWilk
Calcium total (mg/L)	MW-1606	No	n/a	NP	NaN	21	57.1	4.004	x^5	ShapiroWilk
Calcium total (mg/L)	MW-1607	No	n/a	NP	NaN	21	46.52	3.126	ln(x)	ShapiroWilk
Calcium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	69.54	5.532	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1606	No	n/a	NP	NaN	21	0.2038	0.03721	normal	ShapiroWilk
Fluoride total (mg/L)	MW-1607	No	n/a	NP	NaN	21	0.2238	0.02459	sqrt(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.2543	0.03487	ln(x)	ShapiroWilk
pH [field] (std.units)	MW-1606	No	n/a	NP	NaN	21	7.072	0.1943	x^6	ShapiroWilk
pH [field] (std.units)	MW-1607	No	n/a	NP	NaN	21	7.774	0.3067	x^6	ShapiroWilk
pH [field] (std.units)	MW-1609 (bg)	No	n/a	NP	NaN	21	7.333	0.3347	x^6	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1606	No	n/a	NP	NaN	21	338.3	22.39	x^2	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1607	Yes	468,417	NP	NaN	21	300.9	49.68	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	293.3	24.54	ln(x)	ShapiroWilk

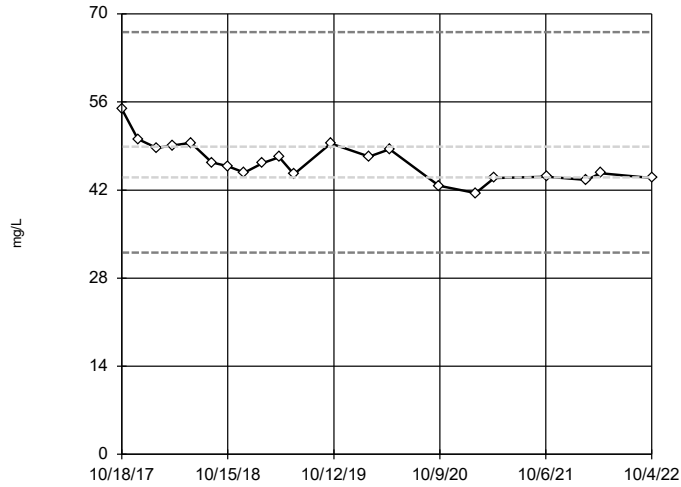
Tukey's Outlier Screening

MW-1606



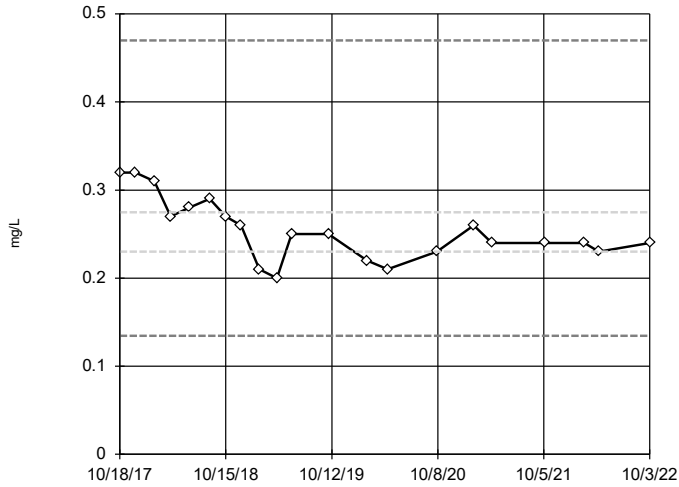
Tukey's Outlier Screening

MW-1607



Tukey's Outlier Screening

MW-1609 (bg)

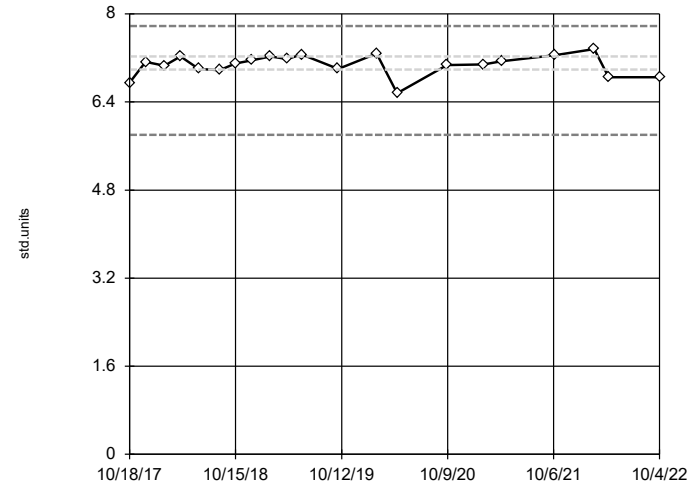


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.4697, low cutoff = 0.1346, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 2:22 PM View: Rome Limestone - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1606

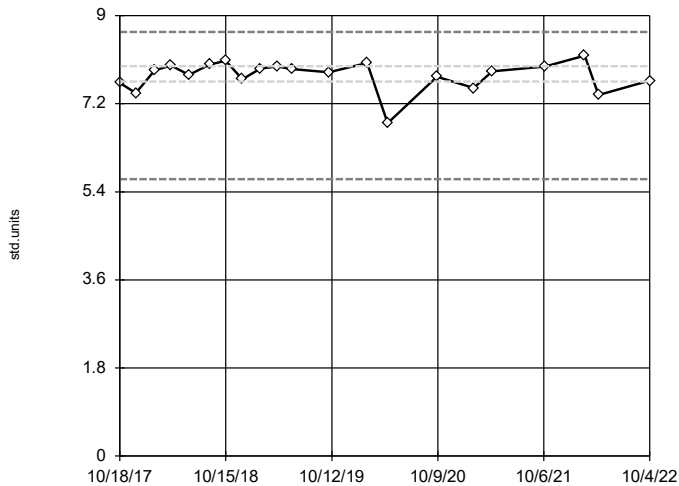


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 7.778, low cutoff = 5.801, based on IQR multiplier of 3.

Constituent: pH [field] Analysis Run 1/24/2023 2:22 PM View: Rome Limestone - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1607

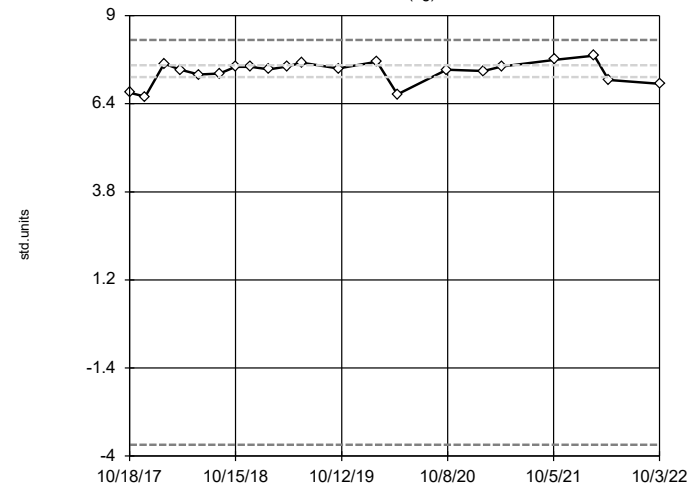


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.667, low cutoff = 5.66, based on IQR multiplier of 3.

Constituent: pH [field] Analysis Run 1/24/2023 2:22 PM View: Rome Limestone - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)

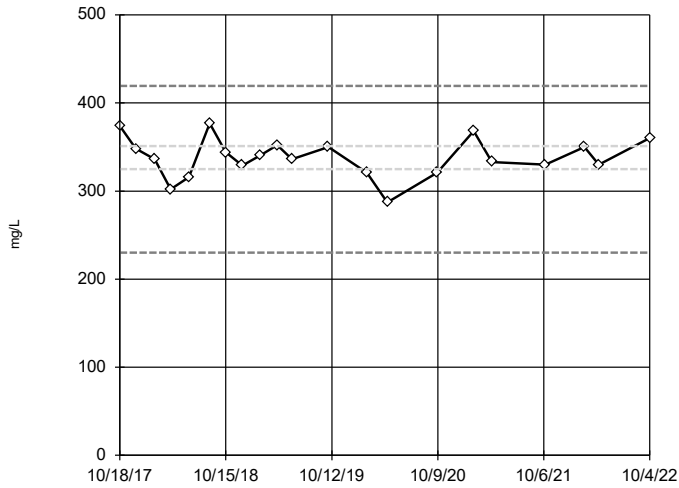


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.285, low cutoff = -3.667, based on IQR multiplier of 3.

Constituent: pH [field] Analysis Run 1/24/2023 2:22 PM View: Rome Limestone - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1606



n = 21

No outliers found.
Tukey's method selected by user.

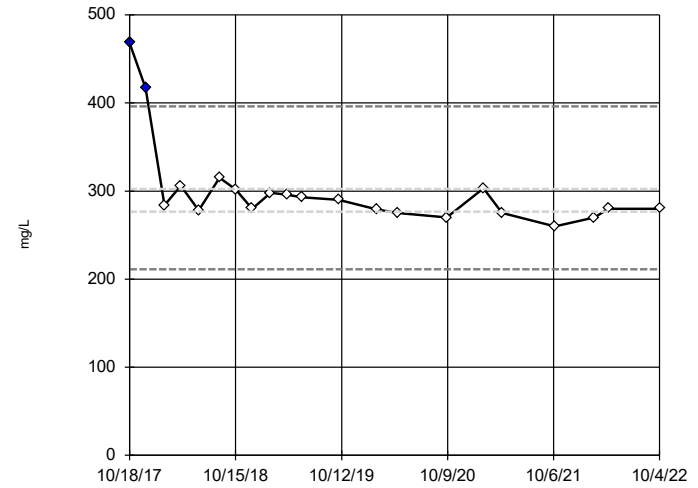
Data were square transformed to achieve best W statistic (graph shown in original units).

High cutoff = 419.4, low cutoff = 230.1, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:22 PM View: Rome Limestone - Pond 1 Out
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1607



n = 21

Outliers are drawn as solid.
Tukey's method selected by user.

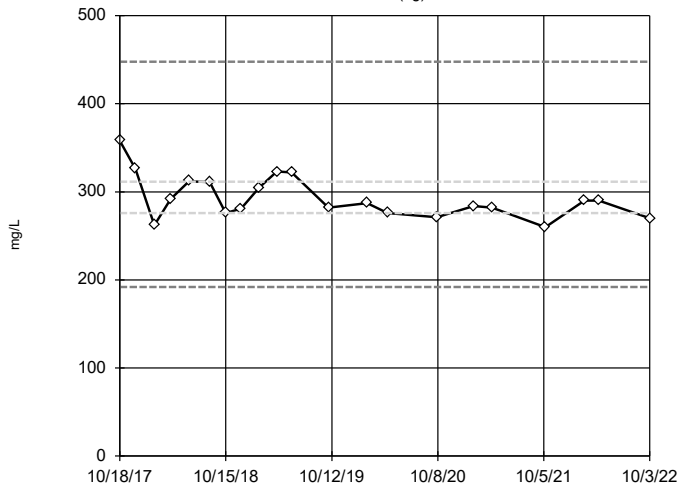
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 396.1, low cutoff = 211.1, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:22 PM View: Rome Limestone - Pond 1 Out
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)



Tukey's Outlier Test - Upgradient Well (Rome Limestone) - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:21 PM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Thallium total (mg/L)	MW-1609 (bg)	Yes	0.00001,0.00001	NP	NaN	21	0.0001605	0.00007392	sqrt(x)	ShapiroWilk

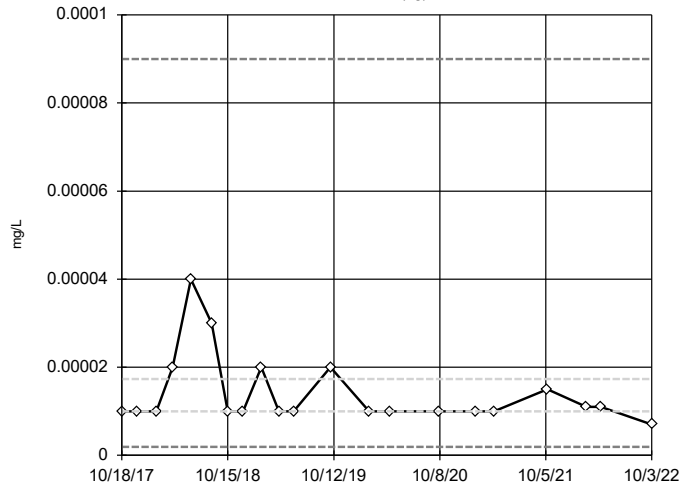
Tukey's Outlier Test - Upgradient Well (Rome Limestone) - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:21 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.00003619	0.00002692	ln(x)	ShapiroWilk
Arsenic total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.0002229	0.000259	ln(x)	ShapiroWilk
Barium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.3951	0.04923	ln(x)	ShapiroWilk
Beryllium total (mg/L)	MW-1609 (bg)	n/a	n/a	NP	NaN	21	0.00004781	0.00001004	unknown	ShapiroWilk
Cadmium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.000014	0.000008062	ln(x)	ShapiroWilk
Chloride total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	1.65	0.8118	ln(x)	ShapiroWilk
Chromium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.0001565	0.00006946	ln(x)	ShapiroWilk
Cobalt total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.0002686	0.0003187	x^(1/3)	ShapiroWilk
Combined Radium 226 and 228 (pCi/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	2.097	1.124	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.2543	0.03487	ln(x)	ShapiroWilk
Lead total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.0004092	0.0002737	x^(1/3)	ShapiroWilk
Lithium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.004414	0.004041	ln(x)	ShapiroWilk
Mercury total (mg/L)	MW-1609 (bg)	n/a	n/a	NP	NaN	21	0.0009571	0.0001964	unknown	ShapiroWilk
Molybdenum total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.001088	0.0007409	ln(x)	ShapiroWilk
Selenium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	0.0002533	0.0002106	ln(x)	ShapiroWilk
Sulfate total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	21	15.53	3.002	ln(x)	ShapiroWilk
Thallium total (mg/L)	MW-1609 (bg)	Yes	0.00001,0.00001	NP	NaN	21	0.0001605	0.00007392	sqrt(x)	ShapiroWilk

Tukey's Outlier Screening

MW-1609 (bg)

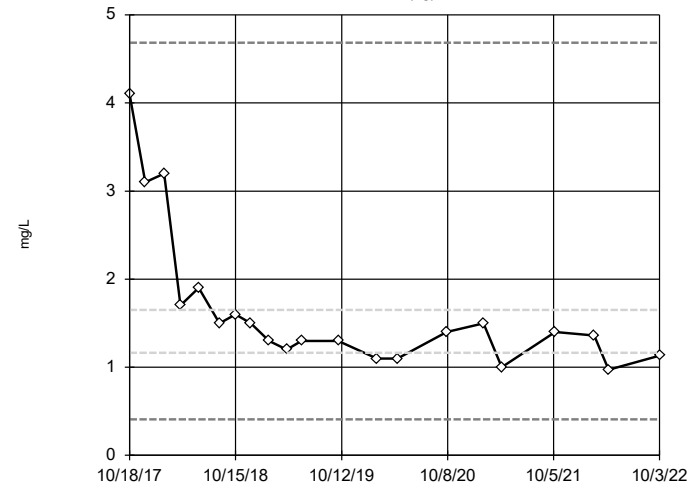


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.00009, low cutoff = 0.00001925, based on IQR multiplier of 3.

Constituent: Cadmium total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)

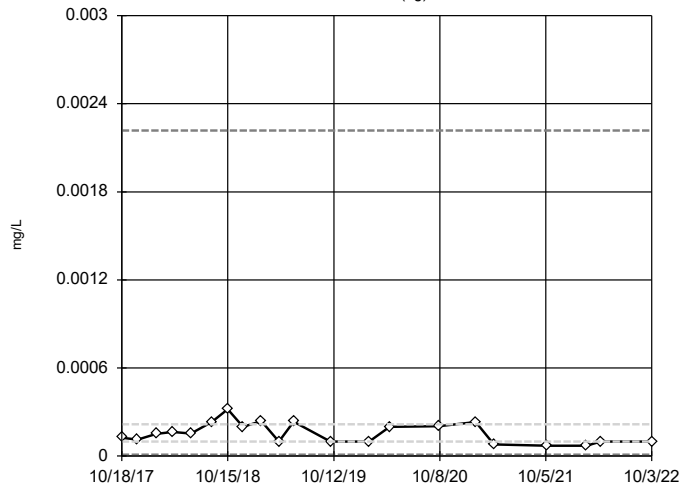


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 4.685, low cutoff = 0.4099, based on IQR multiplier of 3.

Constituent: Chloride total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)

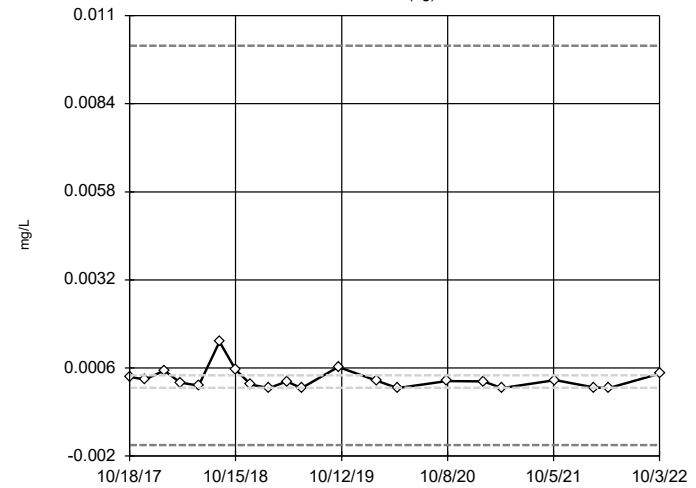


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.002218, low cutoff = 0.00009784, based on IQR multiplier of 3.

Constituent: Chromium total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

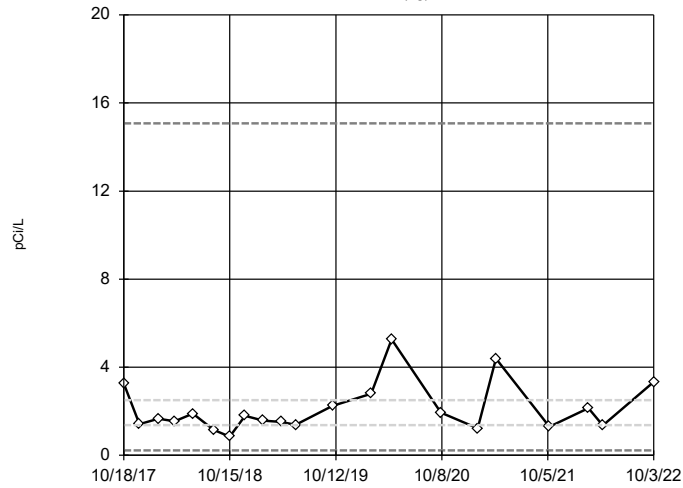
MW-1609 (bg)



n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.01012, low cutoff = -0.001678, based on IQR multiplier of 3.

Constituent: Cobalt total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient
 Clinch River LF Client: AEP Data: Clinch River

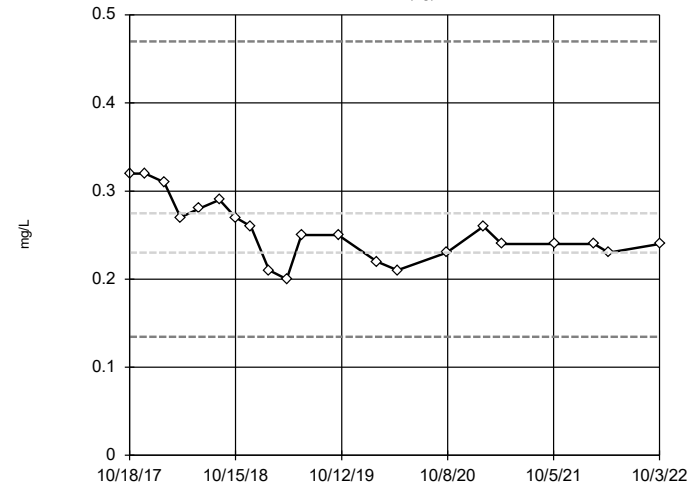
Tukey's Outlier Screening
MW-1609 (bg)



n = 21
No outliers found.
Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 15.08, low cutoff = 0.2277, based on IQR multiplier of 3.

Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - P
Clinch River LF Client: AEP Data: Clinch River

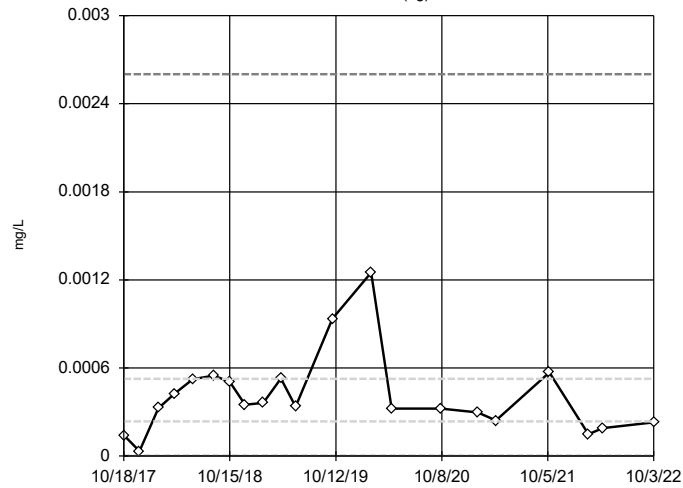
Tukey's Outlier Screening
MW-1609 (bg)



n = 21
No outliers found.
Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.4697, low cutoff = 0.1346, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient O
Clinch River LF Client: AEP Data: Clinch River

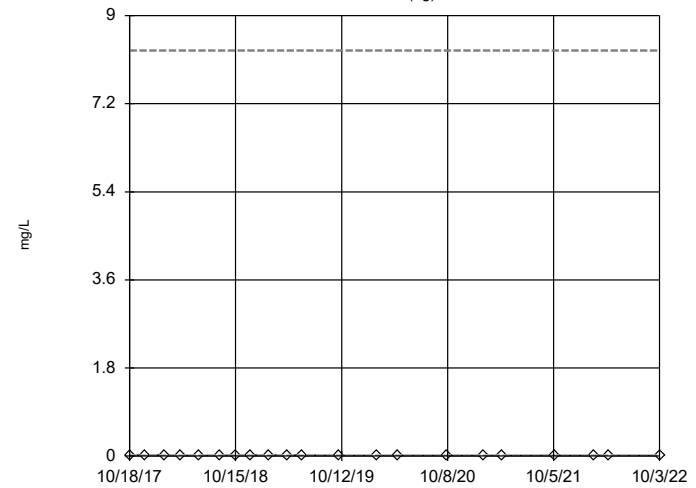
Tukey's Outlier Screening
MW-1609 (bg)



n = 21
No outliers found.
Tukey's method selected by user.
Data were cube root transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.0026, low cutoff = 1.3e-7, based on IQR multiplier of 3.

Constituent: Lead total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient Outli
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening
MW-1609 (bg)

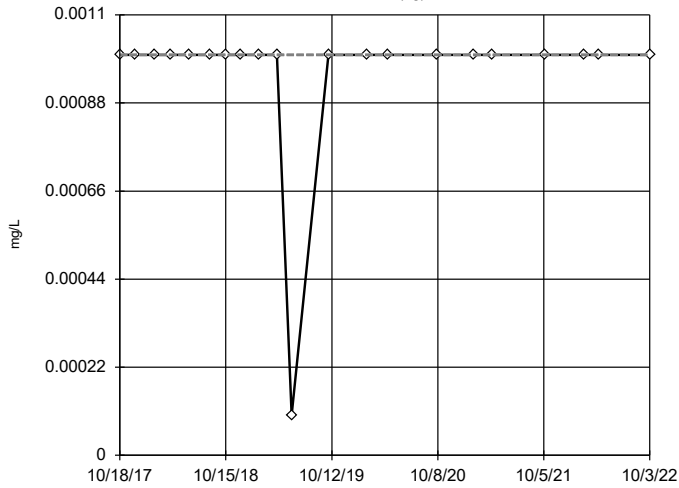


n = 21
No outliers found.
Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 8.29, low cutoff = 0.00001004, based on IQR multiplier of 3.

Constituent: Lithium total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient O
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)

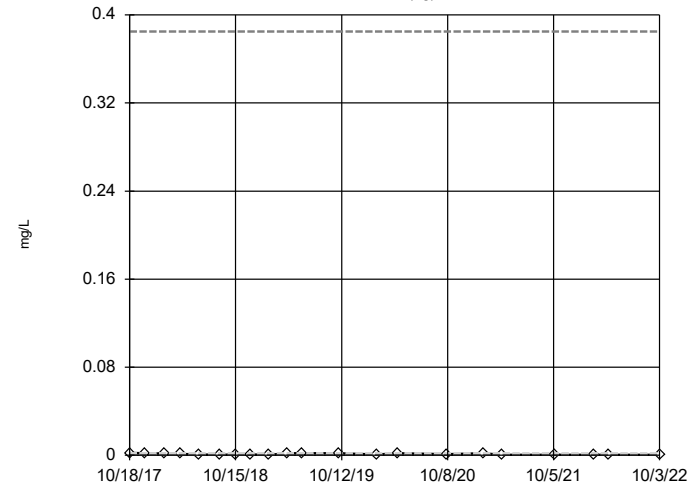


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient O Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)

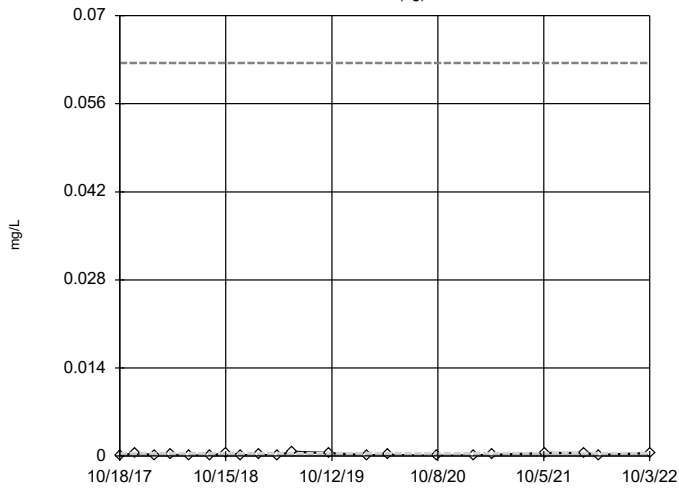


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.3849, low cutoff = 0.0000018, based on IQR multiplier of 3.

Constituent: Molybdenum total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient O Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)

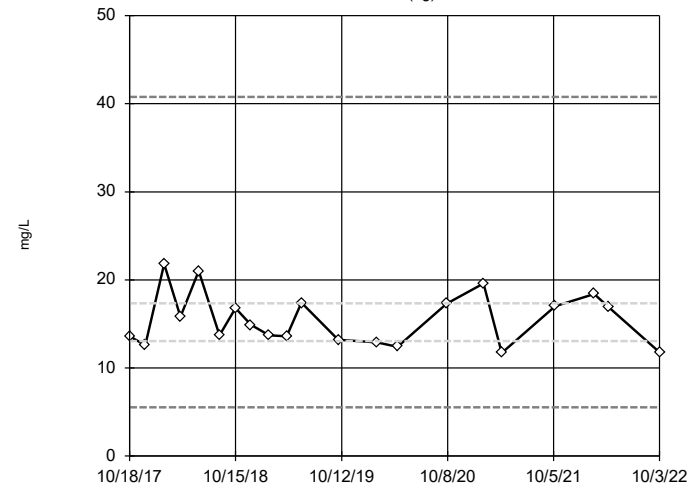


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.0625, low cutoff = 8.0e-7, based on IQR multiplier of 3.

Constituent: Selenium total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient O Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1609 (bg)



n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 40.78, low cutoff = 5.552, based on IQR multiplier of 3.

Constituent: Sulfate total Analysis Run 1/24/2023 2:19 PM View: Rome Limestone - Pond 1 Upgradient O Clinch River LF Client: AEP Data: Clinch River

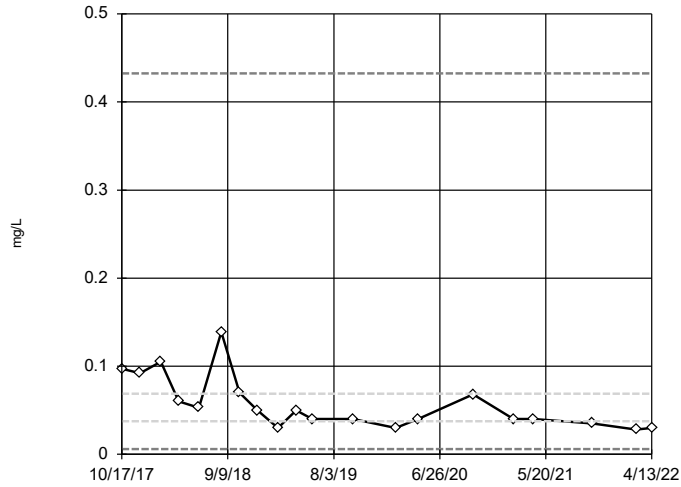
Tukey's Outlier Test - Dumps Fault - All Results (No Significant)

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 3:46 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron total (mg/L)	MW-1610	No	n/a	NP	NaN	20	0.05685	0.03011	ln(x)	ShapiroWilk
Boron total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	20	0.5876	0.06643	x^2	ShapiroWilk
Calcium total (mg/L)	MW-1610	No	n/a	NP	NaN	20	34.12	5.296	x^6	ShapiroWilk
Calcium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	20	48.8	38.78	ln(x)	ShapiroWilk
Chloride total (mg/L)	MW-1610	No	n/a	NP	NaN	20	10.81	0.9226	ln(x)	ShapiroWilk
Chloride total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	20	43.57	39.97	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1610	No	n/a	NP	NaN	20	0.2095	0.04148	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	20	0.9485	0.1762	x^3	ShapiroWilk
pH [field] (std.units)	MW-1610	No	n/a	NP	NaN	20	7.6	0.3241	x^4	ShapiroWilk
pH [field] (std.units)	MW-1611 (bg)	No	n/a	NP	NaN	20	7.748	0.2652	x^6	ShapiroWilk
Sulfate total (mg/L)	MW-1610	No	n/a	NP	NaN	20	39.01	11.67	x^4	ShapiroWilk
Sulfate total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	20	477.9	561.3	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1610	No	n/a	NP	NaN	20	246.1	14.32	x^6	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	20	1271	906.6	ln(x)	ShapiroWilk

Tukey's Outlier Screening

MW-1610

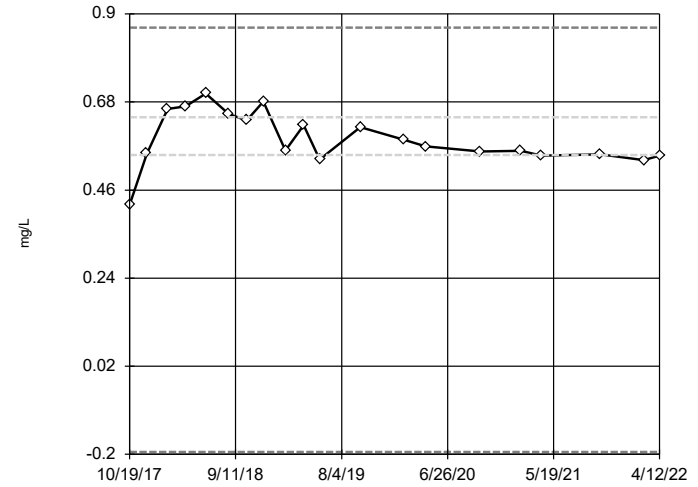


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.4325, low cutoff = 0.005968, based on IQR multiplier of 3.

Constituent: Boron total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

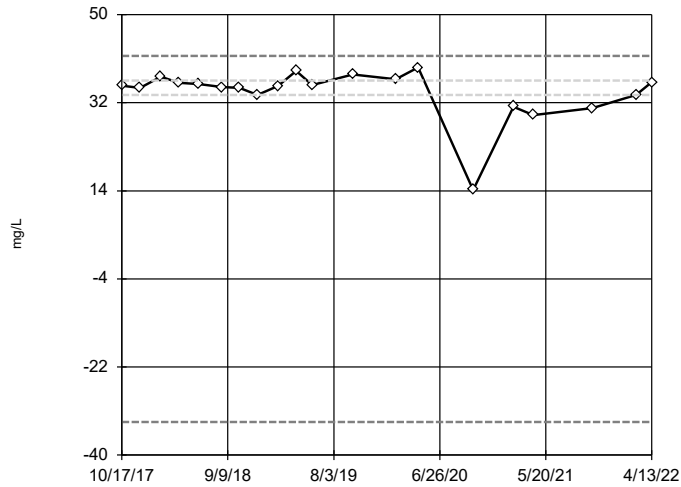


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.8658, low cutoff = -0.194, based on IQR multiplier of 3.

Constituent: Boron total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1610

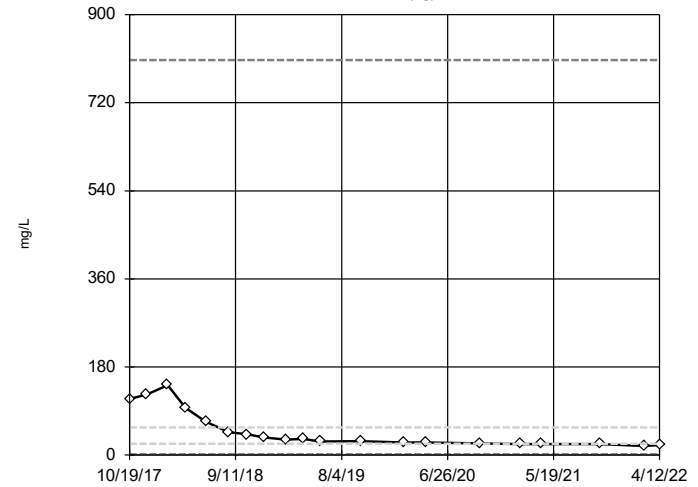


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 41.56, low cutoff = -33.23, based on IQR multiplier of 3.

Constituent: Calcium total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

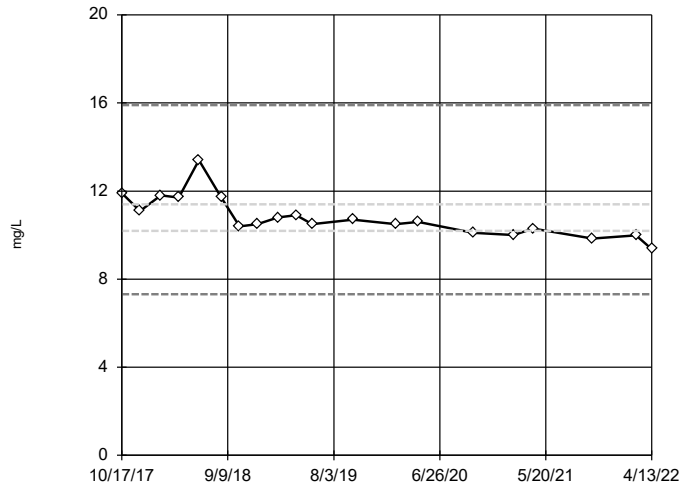


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 807.1, low cutoff = 1.637, based on IQR multiplier of 3.

Constituent: Calcium total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1610

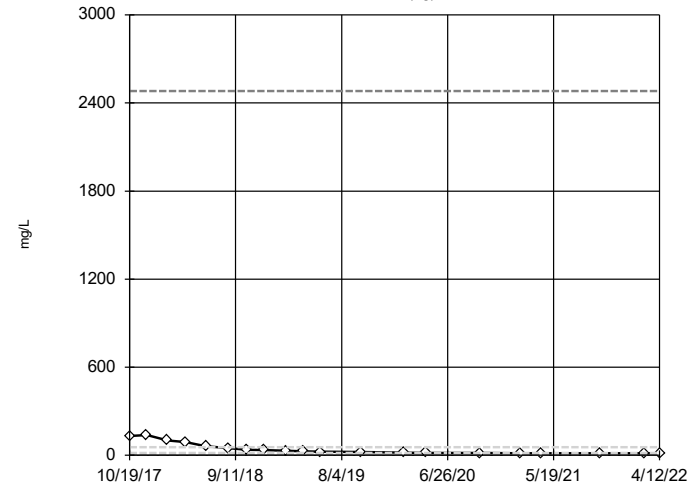


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 15.9, low cutoff = 7.312, based on IQR multiplier of 3.

Constituent: Chloride total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

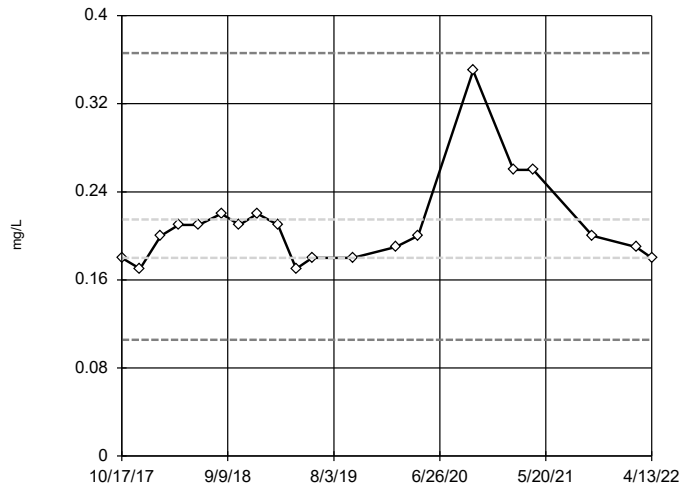


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 2482, low cutoff = 0.34, based on IQR multiplier of 3.

Constituent: Chloride total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1610

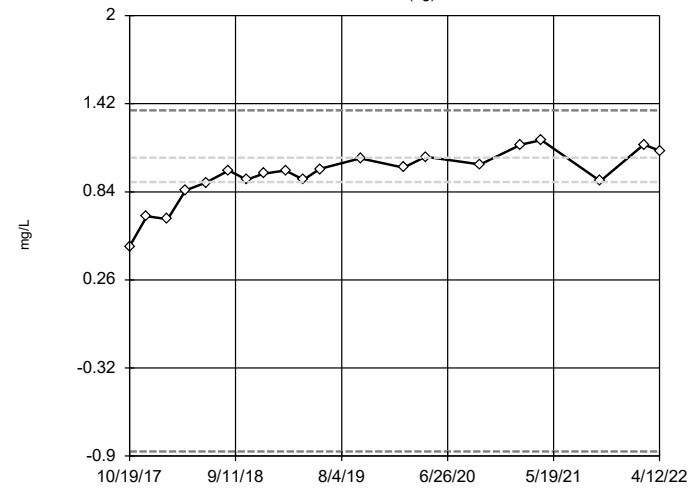


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.366, low cutoff = 0.1057, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

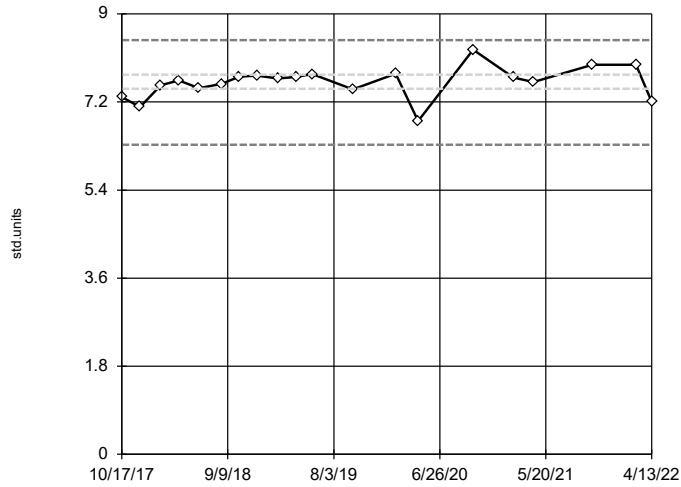


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were cube transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1.377, low cutoff = -0.8702, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1610

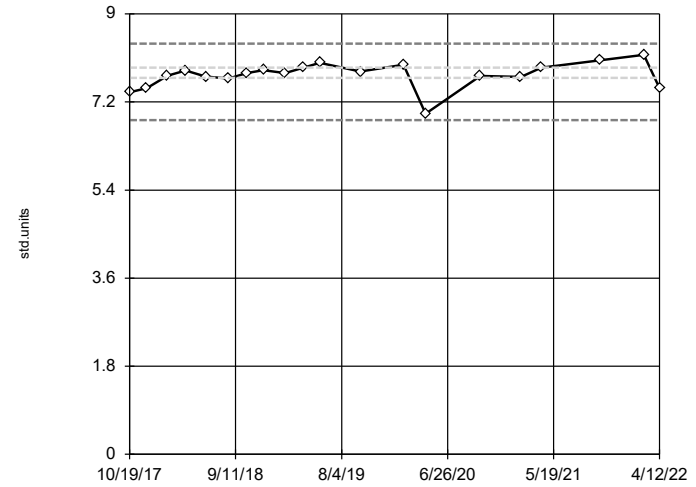


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were x⁴ transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.462, low cutoff = 6.329, based on IQR multiplier of 3.

Constituent: pH [field] Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

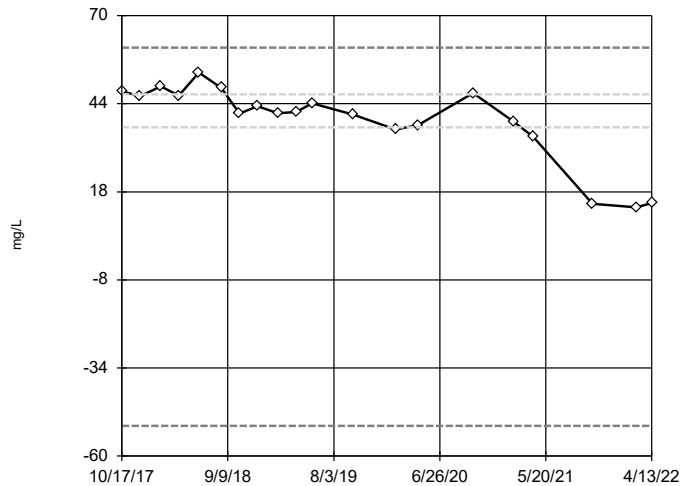


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were x⁶ transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 8.393, low cutoff = 6.827, based on IQR multiplier of 3.

Constituent: pH [field] Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1610

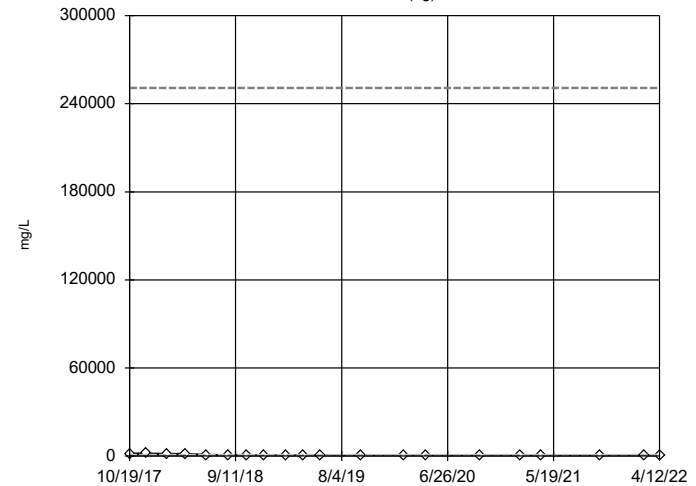


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were x⁴ transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 60.56, low cutoff = -51.03, based on IQR multiplier of 3.

Constituent: Sulfate total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

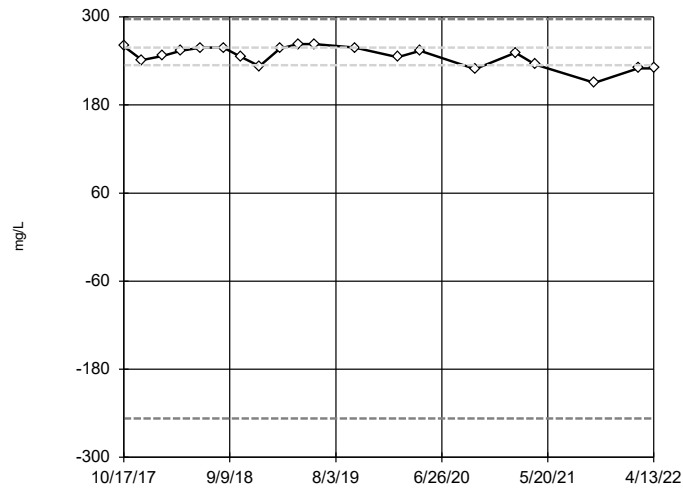


n = 20
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 250833, low cutoff = 0.2355, based on IQR multiplier of 3.

Constituent: Sulfate total Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1610



n = 20

No outliers found. Tukey's method selected by user.

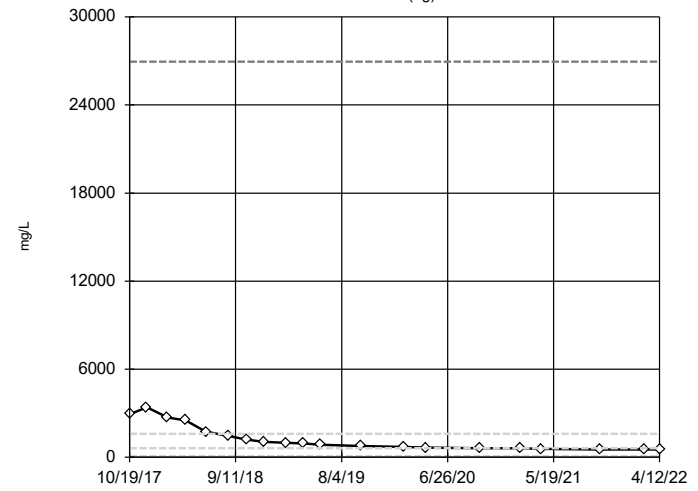
Data were x⁶ transformed to achieve best W statistic (graph shown in original units).

High cutoff = 297.1, low cutoff = -247.2, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)



n = 20

No outliers found. Tukey's method selected by user.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 26952, low cutoff = 36.67, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 3:45 PM View: Dumps Fault - Pond 1 Outliers
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Test - Upgradient Well (Dumps Fault) - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 3:42 PM

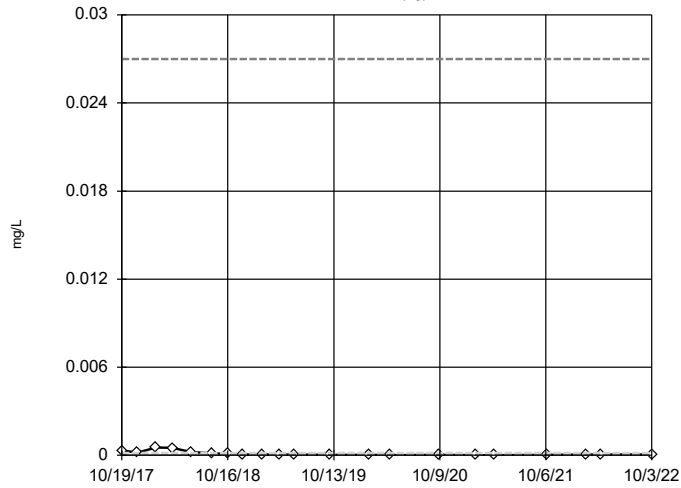
<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Molybdenum total (mg/L)	MW-1611 (bg)	Yes	0.038	NP	NaN	21	0.004046	0.007867	In(x)	ShapiroWilk

Tukey's Outlier Test - Upgradient Well (Dumps Fault) - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 3:42 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.0001229	0.0001542	In(x)	ShapiroWilk
Arsenic total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.01337	0.01	In(x)	ShapiroWilk
Barium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.1142	0.06126	In(x)	ShapiroWilk
Beryllium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.00004019	0.00001799	In(x)	ShapiroWilk
Cadmium total (mg/L)	MW-1611 (bg)	n/a	n/a	NP	NaN	21	0.00001952	0.000002182	unknown	ShapiroWilk
Chromium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.0003836	0.0002275	x^(1/3)	ShapiroWilk
Cobalt total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.00006224	0.00006693	In(x)	ShapiroWilk
Combined Radium 226 and 228 (pCi/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.648	0.443	normal	ShapiroWilk
Fluoride total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.9571	0.1762	x^3	ShapiroWilk
Lead total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.0001882	0.0002047	In(x)	ShapiroWilk
Lithium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.08361	0.02835	In(x)	ShapiroWilk
Mercury total (mg/L)	MW-1611 (bg)	n/a	n/a	NP	NaN	21	0.0009562	0.0002008	unknown	ShapiroWilk
Molybdenum total (mg/L)	MW-1611 (bg)	Yes	0.038	NP	NaN	21	0.004046	0.007867	In(x)	ShapiroWilk
Selenium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	21	0.0001686	0.0001911	In(x)	ShapiroWilk
Thallium total (mg/L)	MW-1611 (bg)	n/a	n/a	NP	NaN	21	0.0001805	0.00005064	unknown	ShapiroWilk

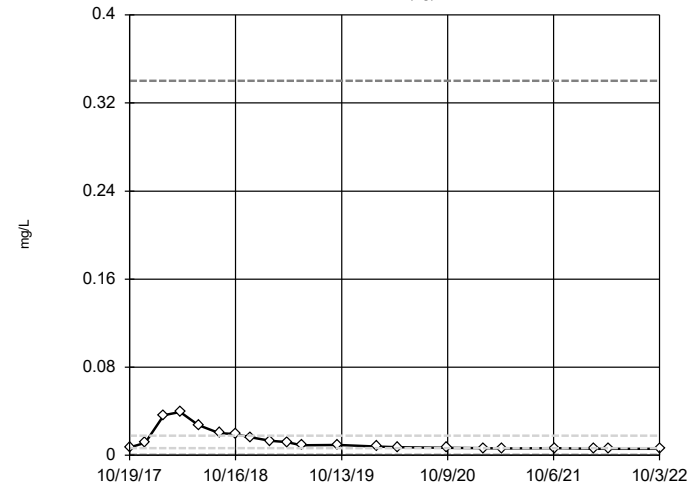
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found.
Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.027, low cutoff = 1.8e-7, based on IQR multiplier of 3.

Constituent: Antimony total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
Clinch River LF Client: AEP Data: Clinch River

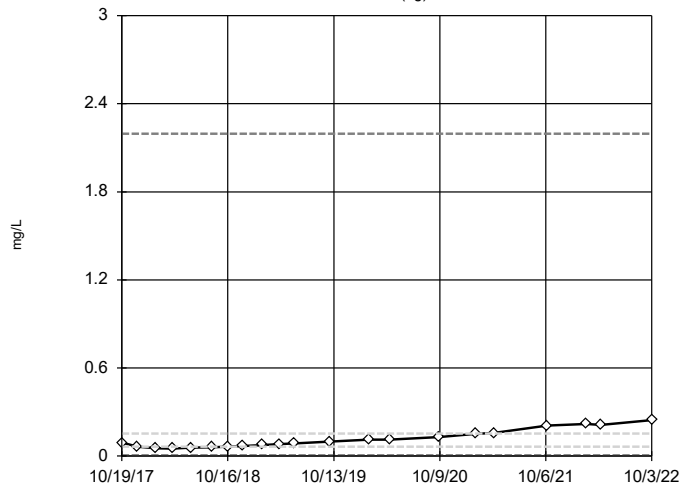
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found.
Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.3402, low cutoff = 0.0003458, based on IQR multiplier of 3.

Constituent: Arsenic total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
Clinch River LF Client: AEP Data: Clinch River

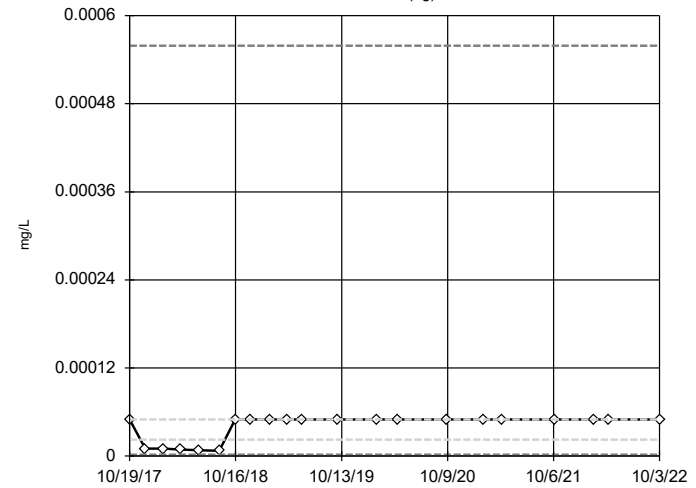
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found.
Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 2.195, low cutoff = 0.004454, based on IQR multiplier of 3.

Constituent: Barium total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening
MW-1611 (bg)

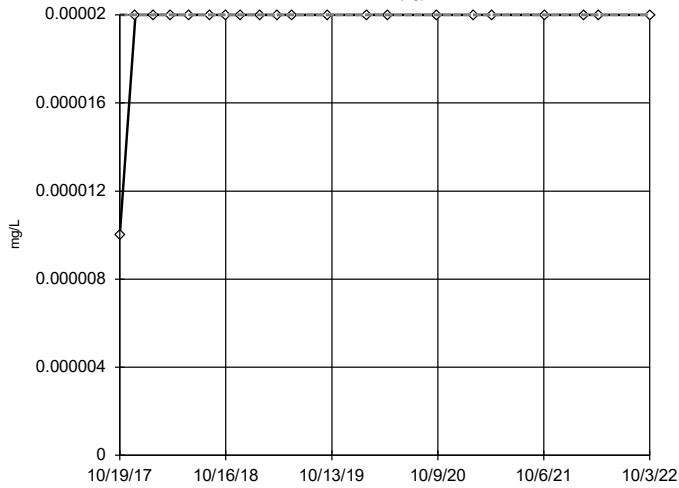


n = 21
No outliers found.
Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.000559, low cutoff = 0.000002, based on IQR multiplier of 3.

Constituent: Beryllium total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

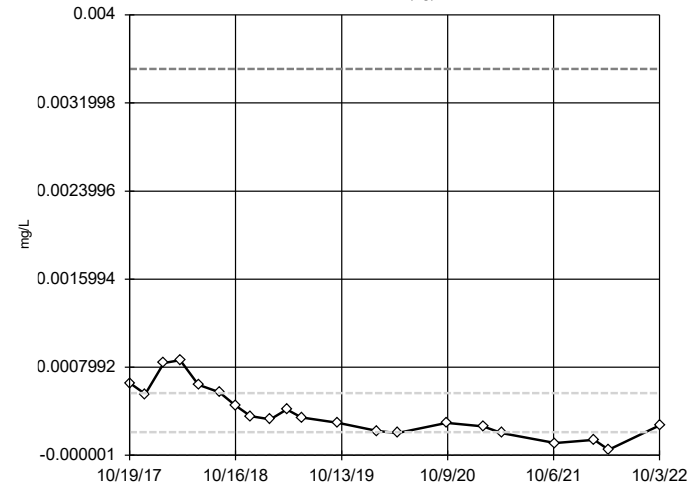


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Out
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

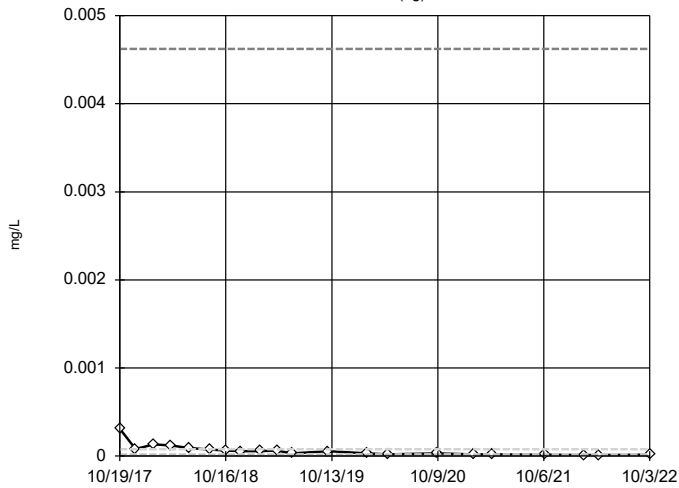


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were cube root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.00351, low cutoff = -9.7e-7, based on IQR multiplier of 3.

Constituent: Chromium total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Out
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

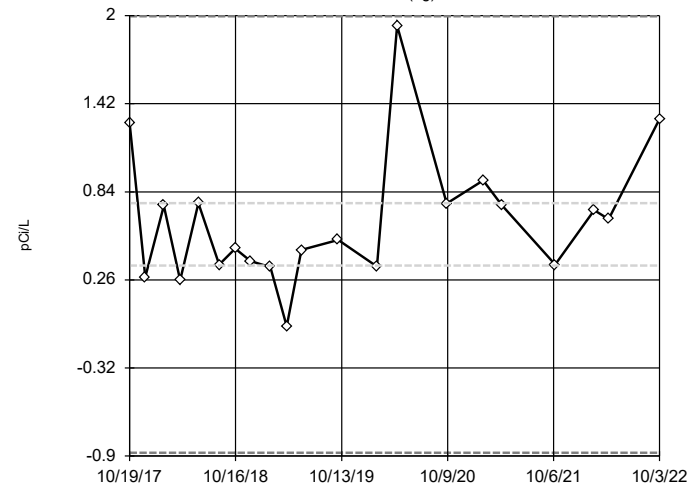


n = 21
 No outliers found.
 Tukey's method selected by user.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.004621, low cutoff = 3.4e-7, based on IQR multiplier of 3.

Constituent: Cobalt total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

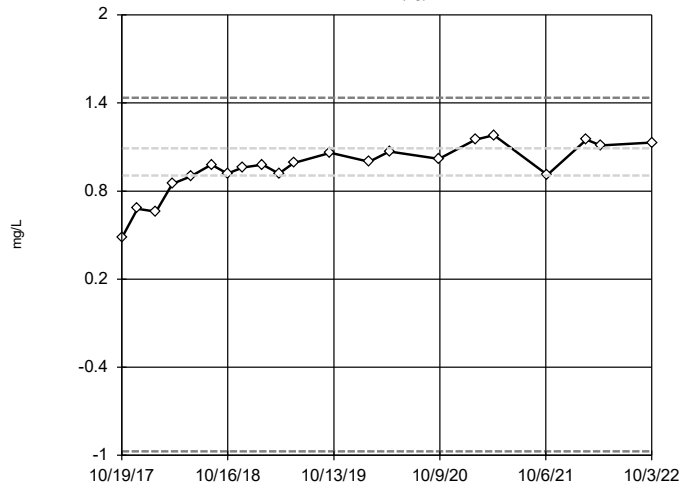
MW-1611 (bg)



n = 21
 No outliers found.
 Tukey's method selected by user.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 1.996, low cutoff = -0.8781, based on IQR multiplier of 3.

Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond
 Clinch River LF Client: AEP Data: Clinch River

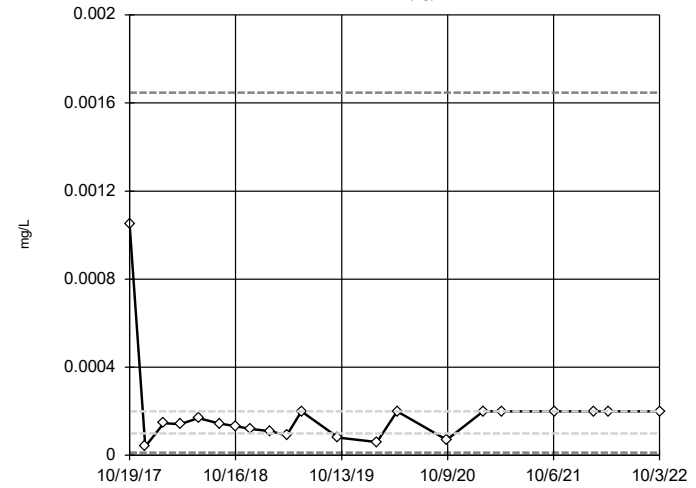
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found. Tukey's method selected by user.
Data were cube transformed to achieve best W statistic (graph shown in original units).
High cutoff = 1.436, low cutoff = -0.974, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
Clinch River LF Client: AEP Data: Clinch River

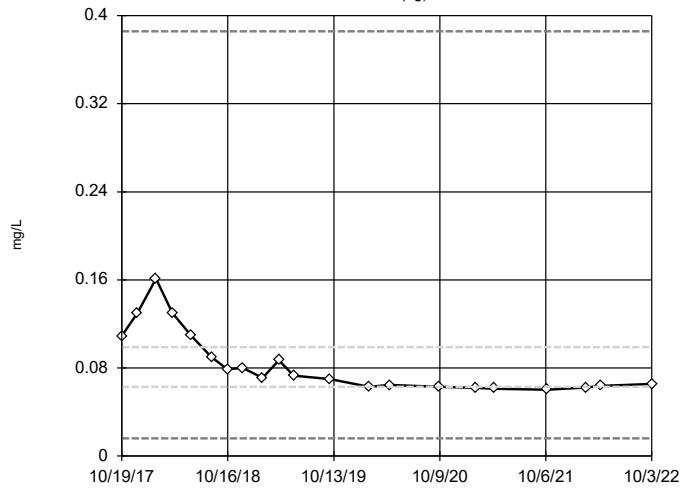
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found. Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.001647, low cutoff = 0.00001203, based on IQR multiplier of 3.

Constituent: Lead total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outliers
Clinch River LF Client: AEP Data: Clinch River

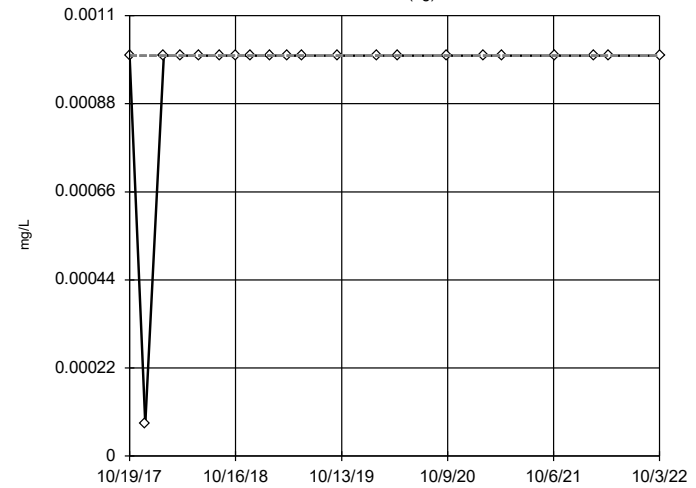
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found. Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.3858, low cutoff = 0.01616, based on IQR multiplier of 3.

Constituent: Lithium total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
Clinch River LF Client: AEP Data: Clinch River

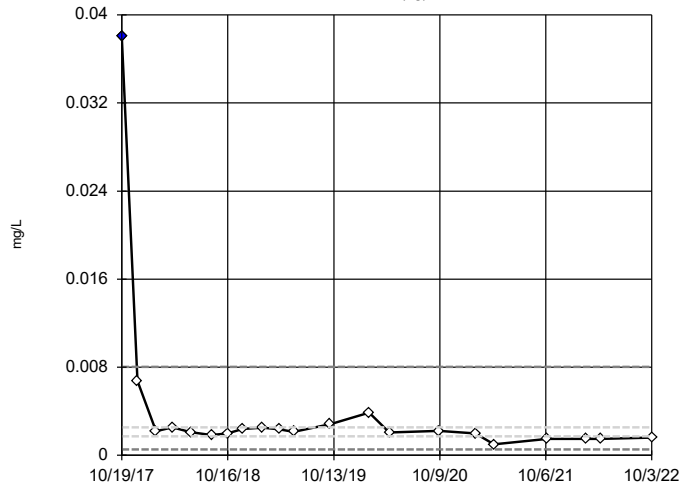
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found. Tukey's method selected by user.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outlier
Clinch River LF Client: AEP Data: Clinch River

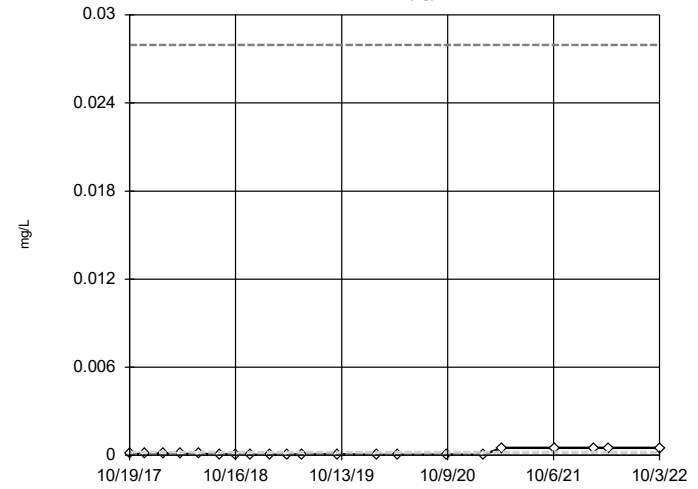
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
Outlier is drawn as solid. Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.008045, low cutoff = 0.000541, based on IQR multiplier of 3.

Constituent: Molybdenum total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Clinch River LF Client: AEP Data: Clinch River

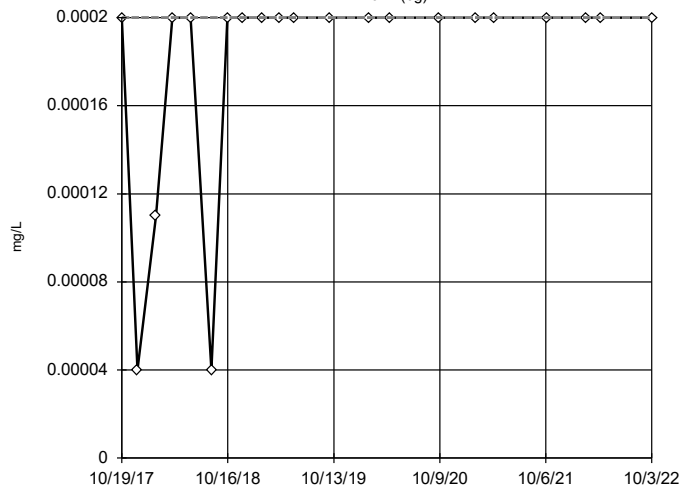
Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found. Tukey's method selected by user.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.02795, low cutoff = 3.6e-7, based on IQR multiplier of 3.

Constituent: Selenium total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outli Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening
MW-1611 (bg)



n = 21
No outliers found. Tukey's method selected by user.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium total Analysis Run 1/24/2023 3:40 PM View: Dumps Fault - Pond 1 Upgradient Outli Clinch River LF Client: AEP Data: Clinch River

FIGURE D.

Welch's t-test/Mann-Whitney - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:50 PM

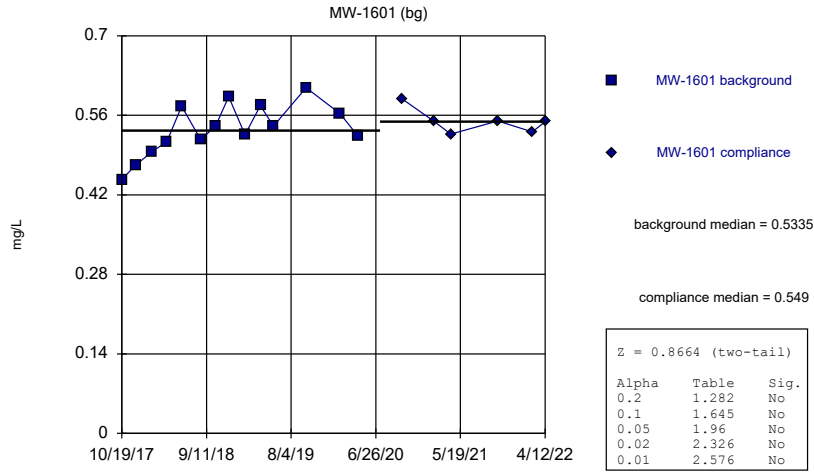
<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Method</u>
Fluoride total (mg/L)	MW-1604	3.435	Yes	Mann-W
Sulfate total (mg/L)	MW-1603	-3.185	Yes	Mann-W
Sulfate total (mg/L)	MW-1604	-3.008	Yes	Mann-W
Sulfate total (mg/L)	MW-1605	-3.347	Yes	Mann-W
Total Dissolved Solids (mg/L)	MW-1605	-3.203	Yes	Mann-W

Welch's t-test/Mann-Whitney - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:50 PM

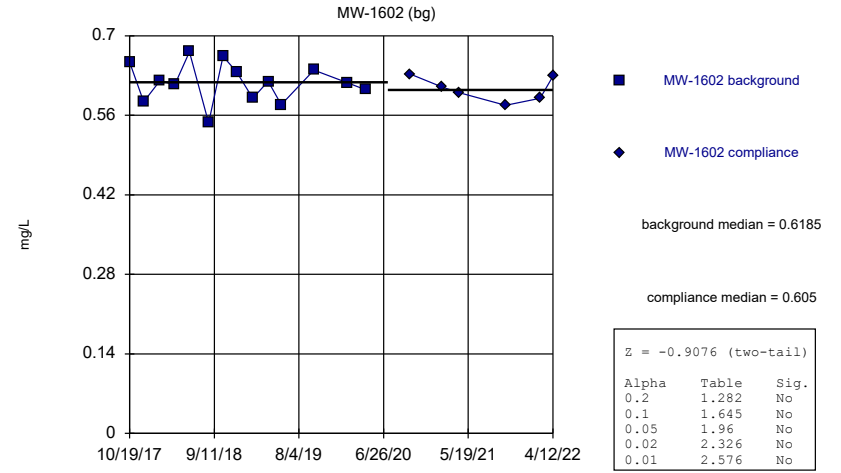
<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Method</u>
Boron total (mg/L)	MW-1601 (bg)	0.8664	No	Mann-W
Boron total (mg/L)	MW-1602 (bg)	-0.9076	No	Mann-W
Boron total (mg/L)	MW-1603	0.9485	No	Mann-W
Boron total (mg/L)	MW-1604	0.7426	No	Mann-W
Boron total (mg/L)	MW-1605	-1.196	No	Mann-W
Boron total (mg/L)	MW-1608 (bg)	-0.08254	No	Mann-W
Boron total (mg/L)	MW-1612	-2.061	No	Mann-W
Fluoride total (mg/L)	MW-1601 (bg)	2.438	No	Mann-W
Fluoride total (mg/L)	MW-1602 (bg)	2.44	No	Mann-W
Fluoride total (mg/L)	MW-1603	0.3764	No	Mann-W
Fluoride total (mg/L)	MW-1604	3.435	Yes	Mann-W
Fluoride total (mg/L)	MW-1605	-1.075	No	Mann-W
Fluoride total (mg/L)	MW-1608 (bg)	0.08323	No	Mann-W
Fluoride total (mg/L)	MW-1612	-0.265	No	Mann-W
Sulfate total (mg/L)	MW-1601 (bg)	-0.9489	No	Mann-W
Sulfate total (mg/L)	MW-1602 (bg)	-2.021	No	Mann-W
Sulfate total (mg/L)	MW-1603	-3.185	Yes	Mann-W
Sulfate total (mg/L)	MW-1604	-3.008	Yes	Mann-W
Sulfate total (mg/L)	MW-1605	-3.347	Yes	Mann-W
Sulfate total (mg/L)	MW-1608 (bg)	-1.2	No	Mann-W
Sulfate total (mg/L)	MW-1612	-2.557	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1601 (bg)	0.0413	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1602 (bg)	0.3717	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1603	2.268	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1604	0.8282	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1605	-3.203	Yes	Mann-W
Total Dissolved Solids (mg/L)	MW-1608 (bg)	-1.651	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1612	-0.7068	No	Mann-W

Mann-Whitney (Wilcoxon Rank Sum)



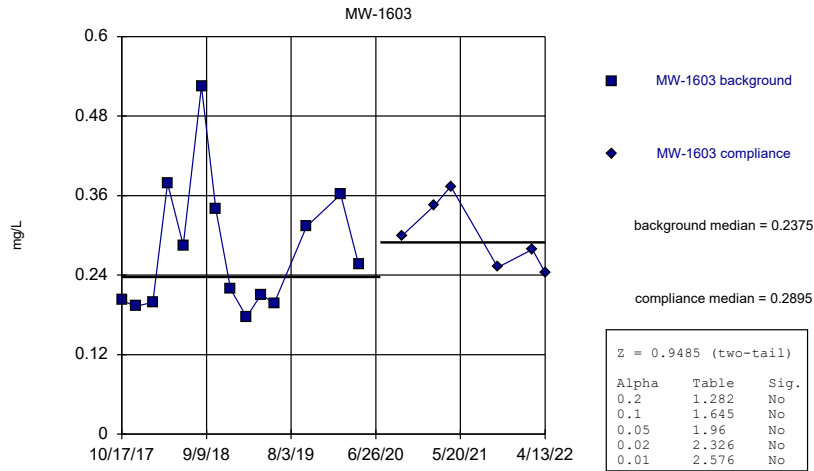
Constituent: Boron total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)



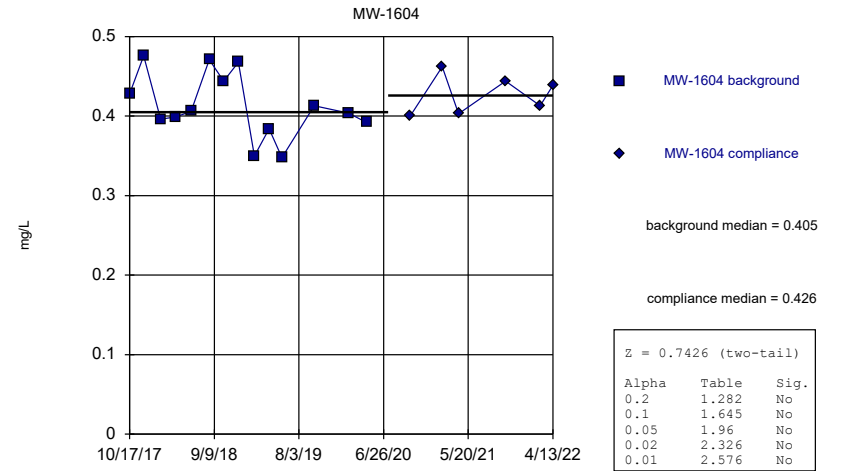
Constituent: Boron total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)



Constituent: Boron total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

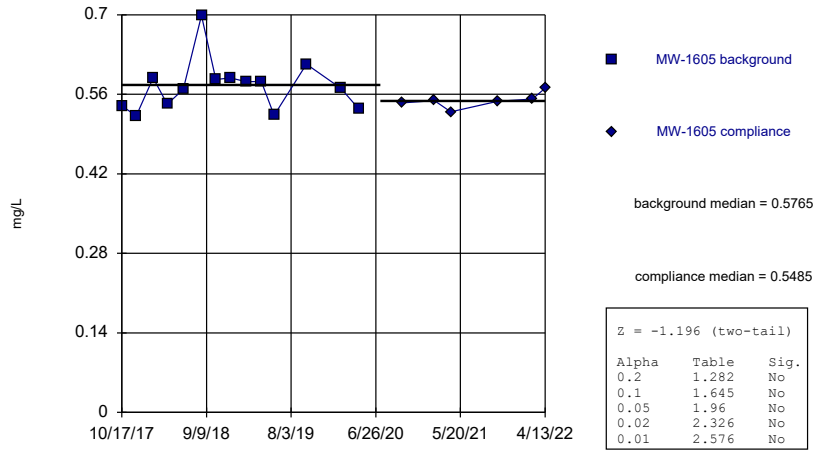
Mann-Whitney (Wilcoxon Rank Sum)



Constituent: Boron total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

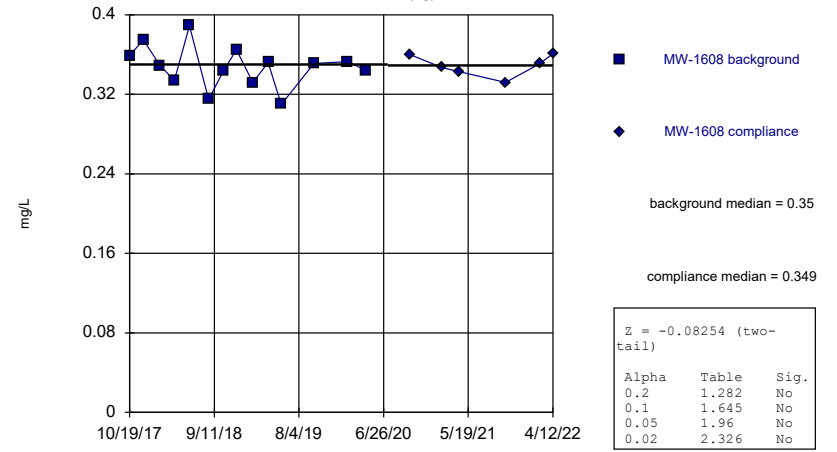
MW-1605



Constituent: Boron total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

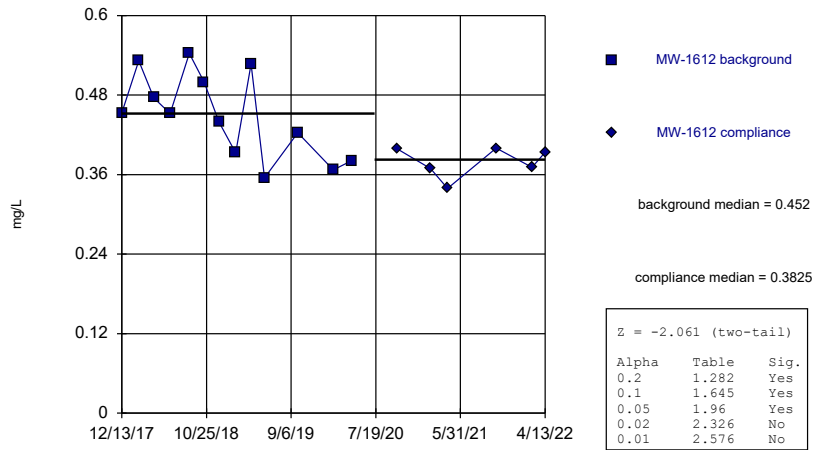
MW-1608 (bg)



Constituent: Boron total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

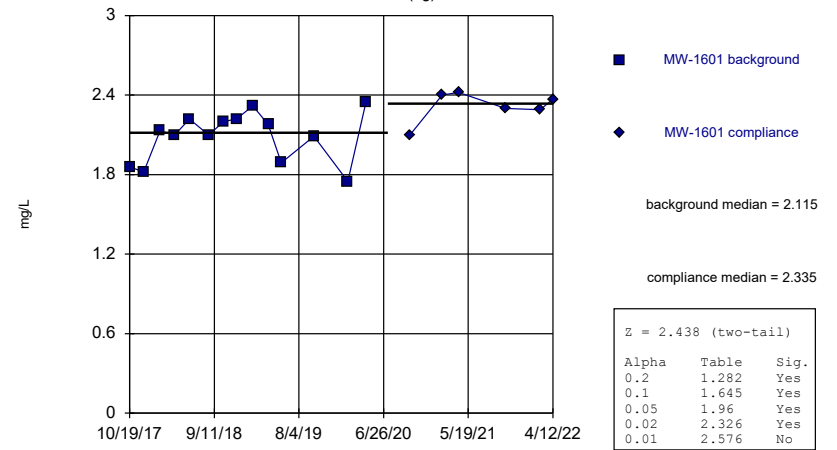
MW-1612



Constituent: Boron total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

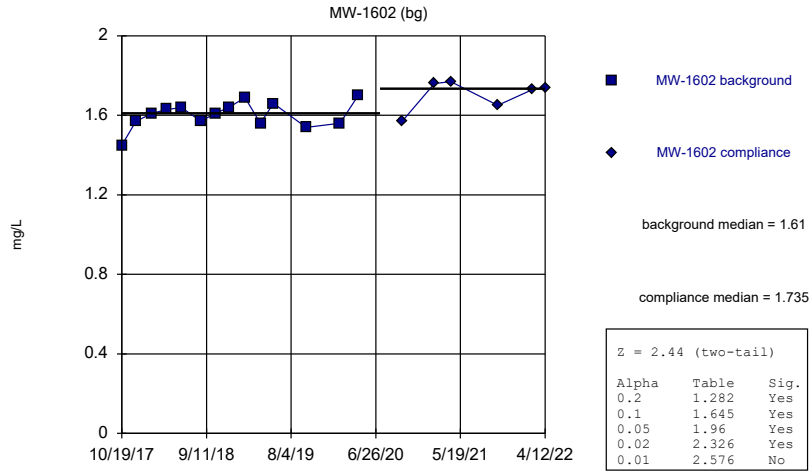
Mann-Whitney (Wilcoxon Rank Sum)

MW-1601 (bg)



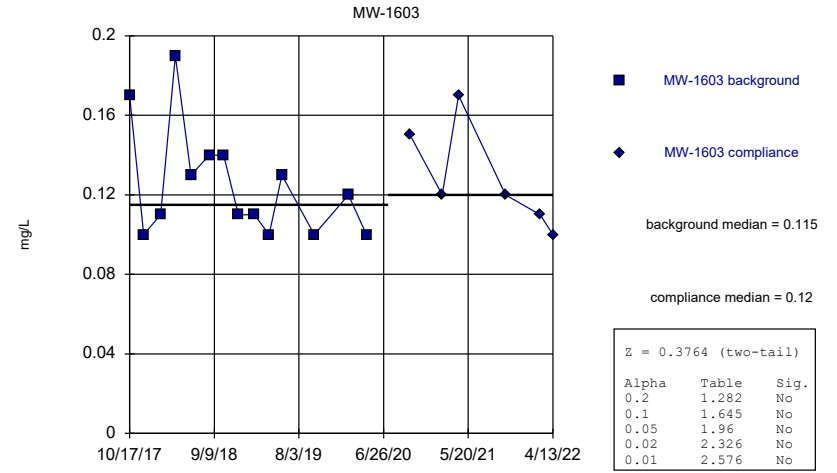
Constituent: Fluoride total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)



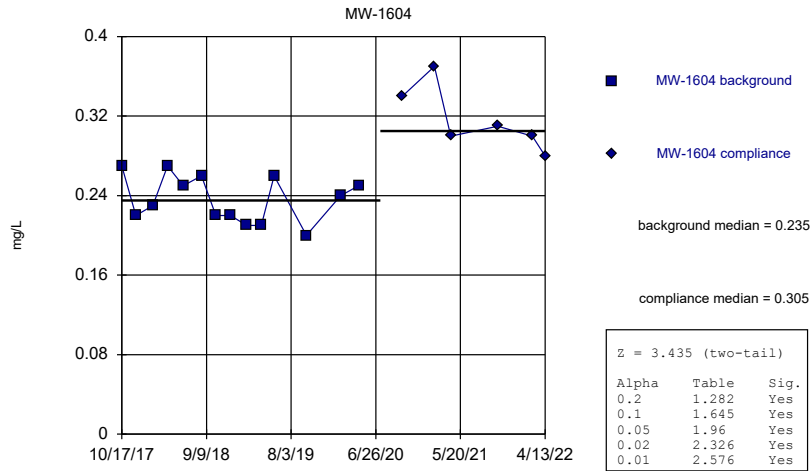
Constituent: Fluoride total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-W
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)



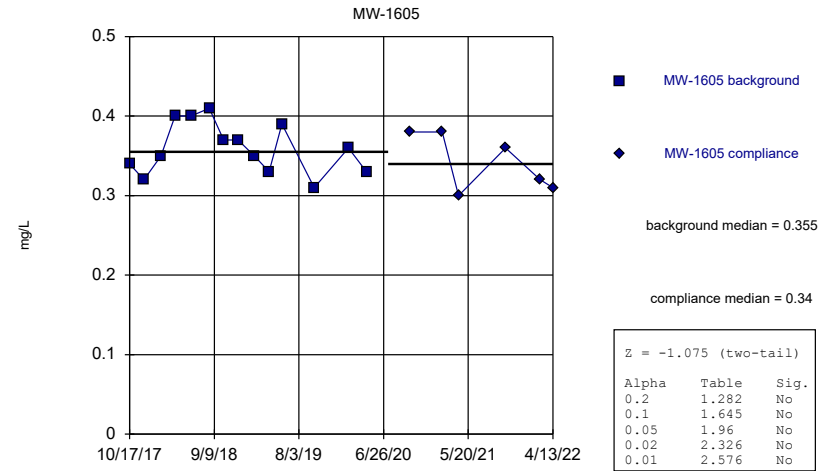
Constituent: Fluoride total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-W
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)



Constituent: Fluoride total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-W
Clinch River LF Client: AEP Data: Clinch River

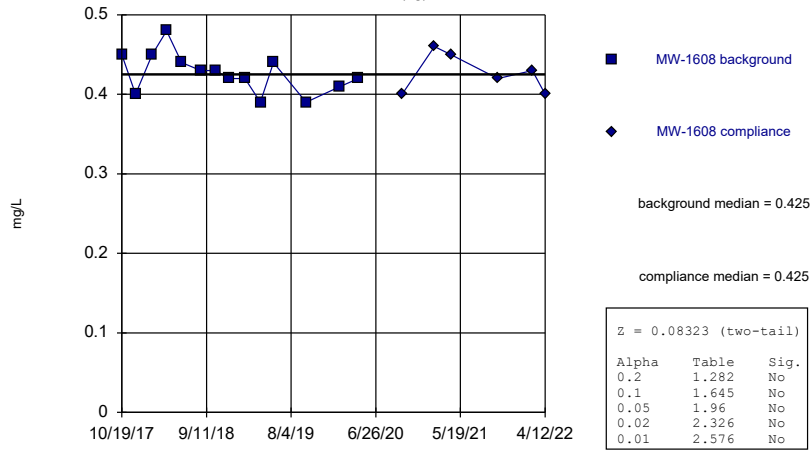
Mann-Whitney (Wilcoxon Rank Sum)



Constituent: Fluoride total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-W
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

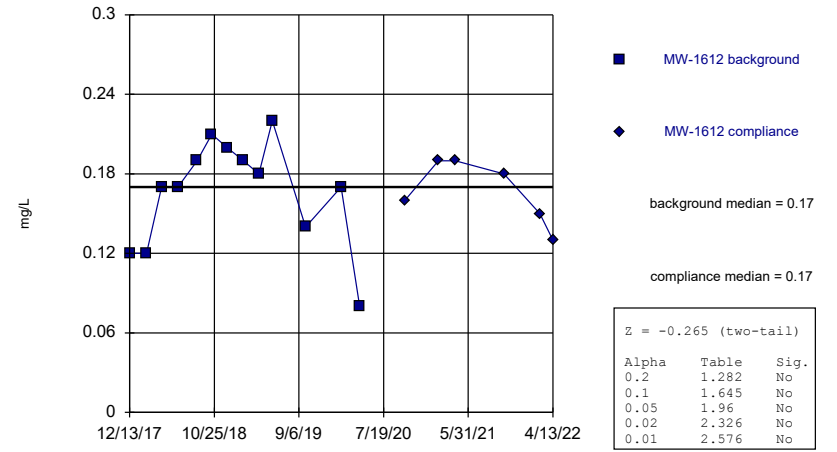
MW-1608 (bg)



Constituent: Fluoride total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Wh
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

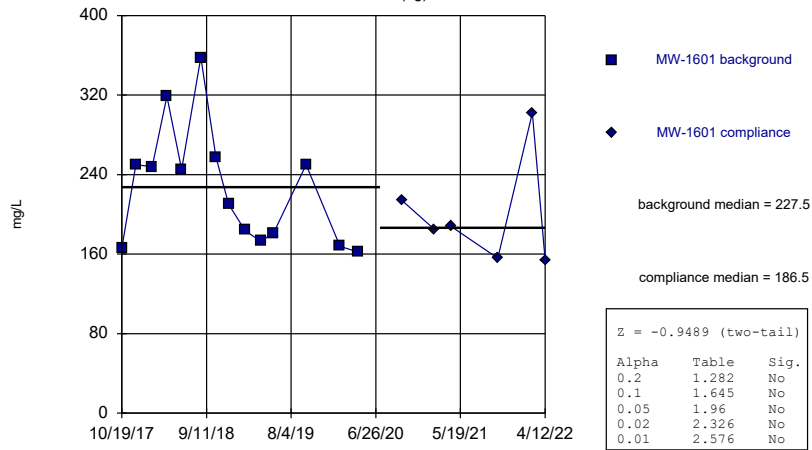
MW-1612



Constituent: Fluoride total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Wh
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

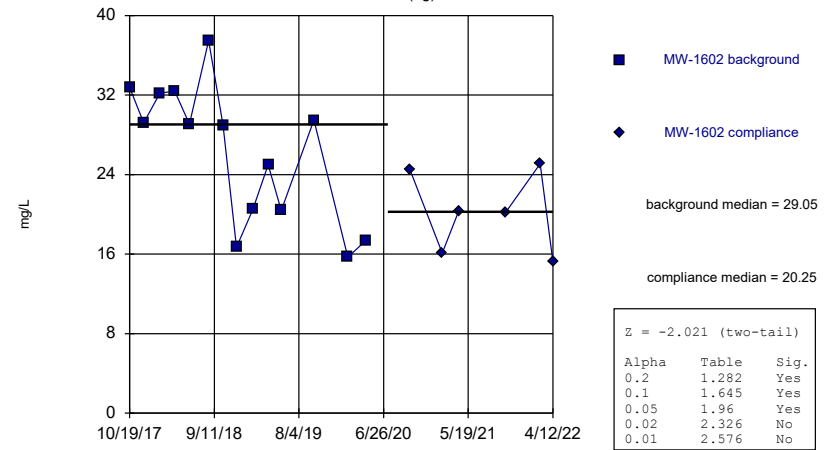
MW-1601 (bg)



Constituent: Sulfate total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Wh
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

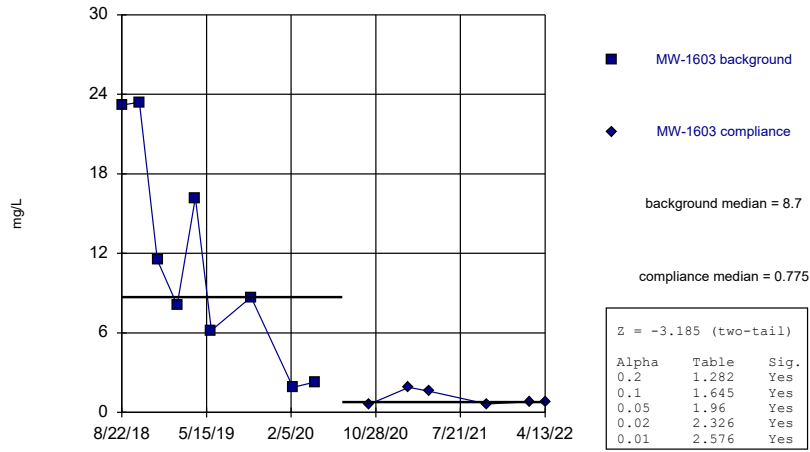
MW-1602 (bg)



Constituent: Sulfate total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Wh
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

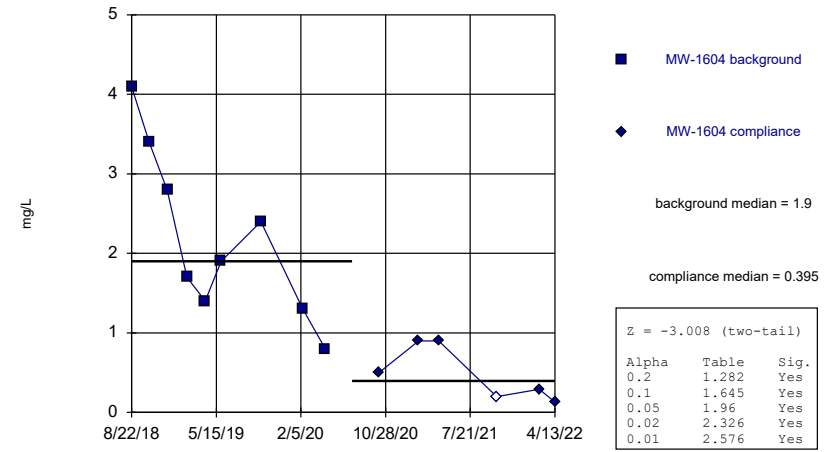
MW-1603



Constituent: Sulfate total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

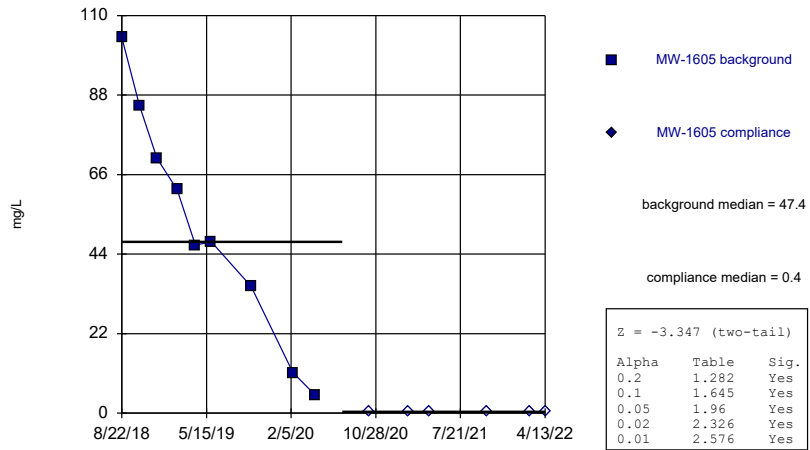
MW-1604



Constituent: Sulfate total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

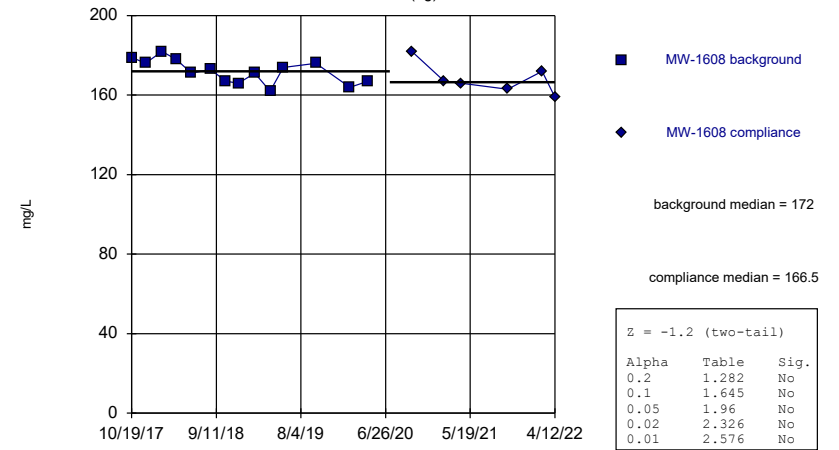
MW-1605



Constituent: Sulfate total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

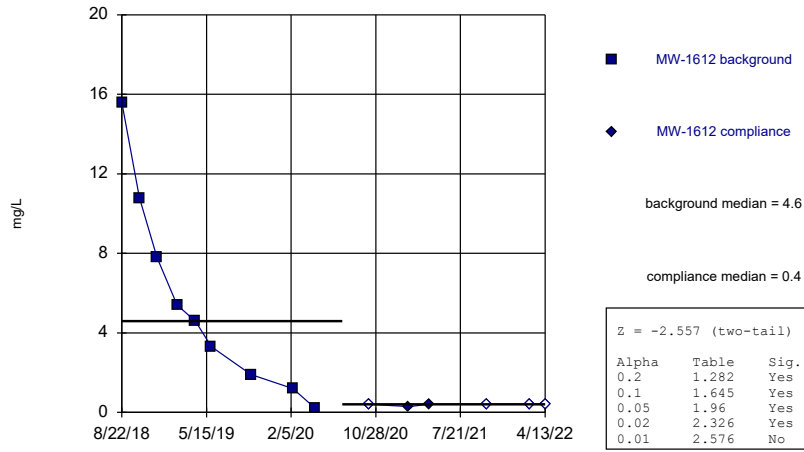
MW-1608 (bg)



Constituent: Sulfate total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

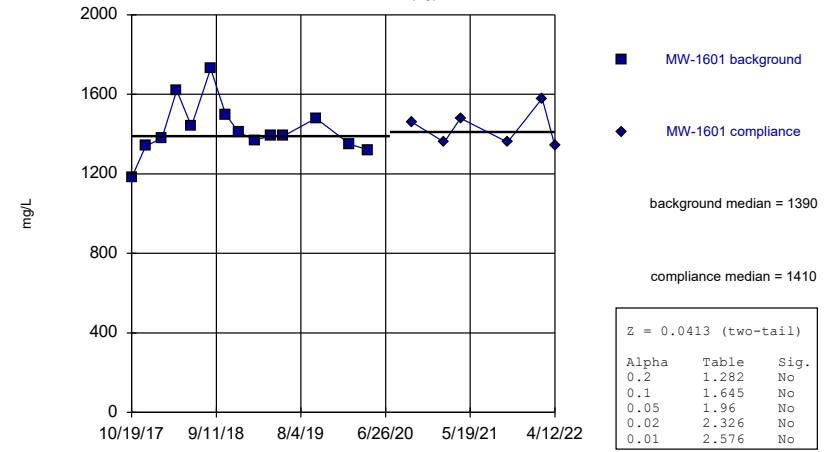
MW-1612



Constituent: Sulfate total Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1 Mann-Whit
 Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

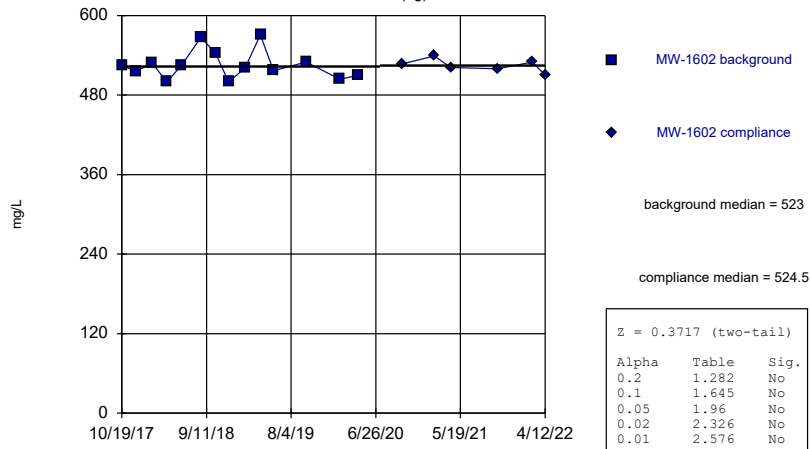
MW-1601 (bg)



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

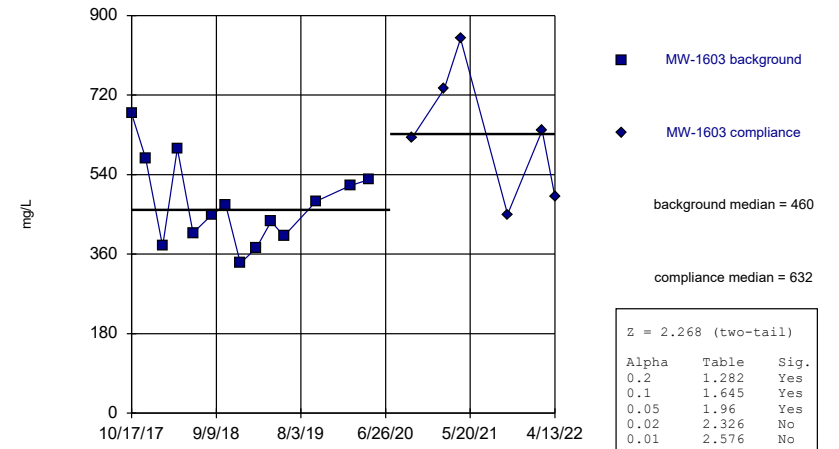
MW-1602 (bg)



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

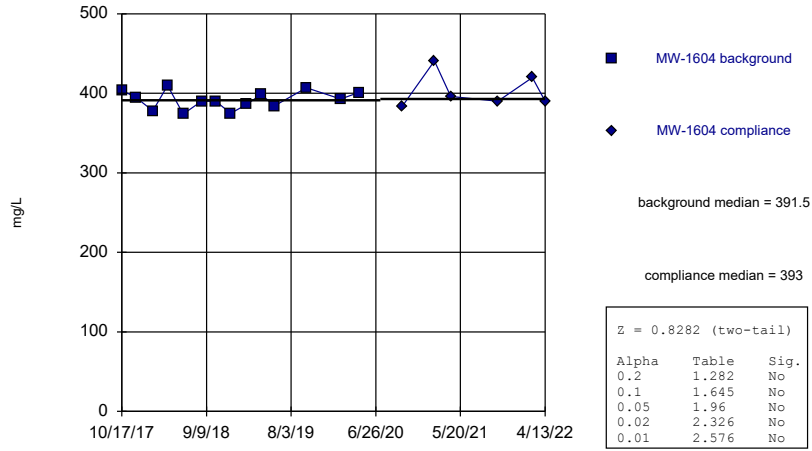
MW-1603



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1
 Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

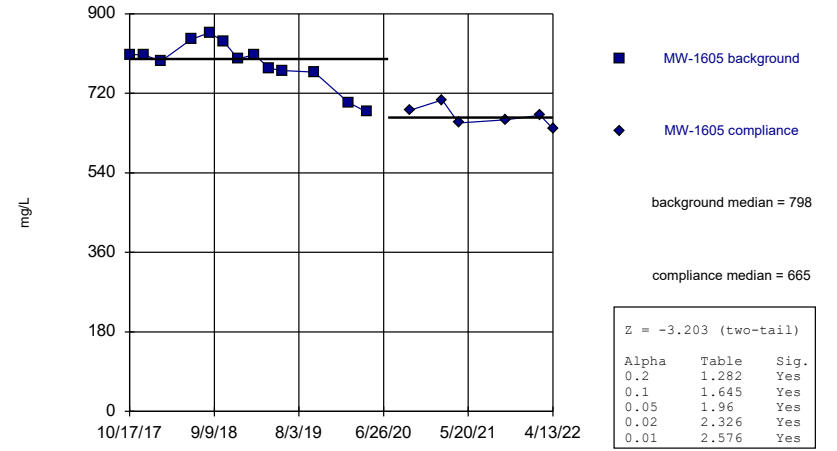
MW-1604



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

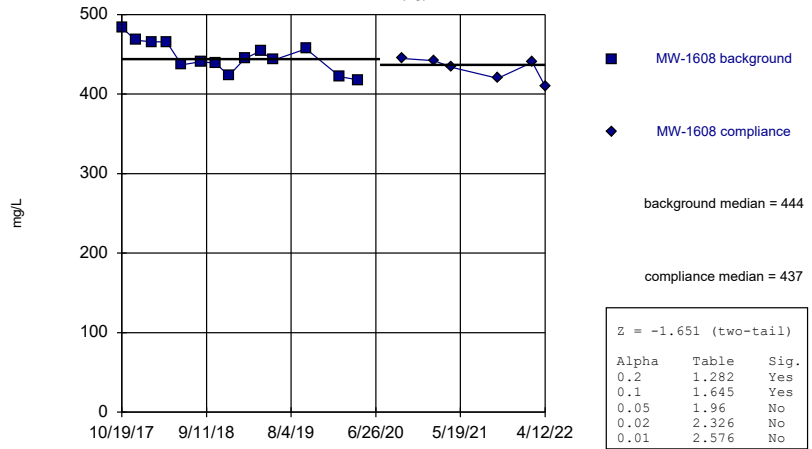
MW-1605



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

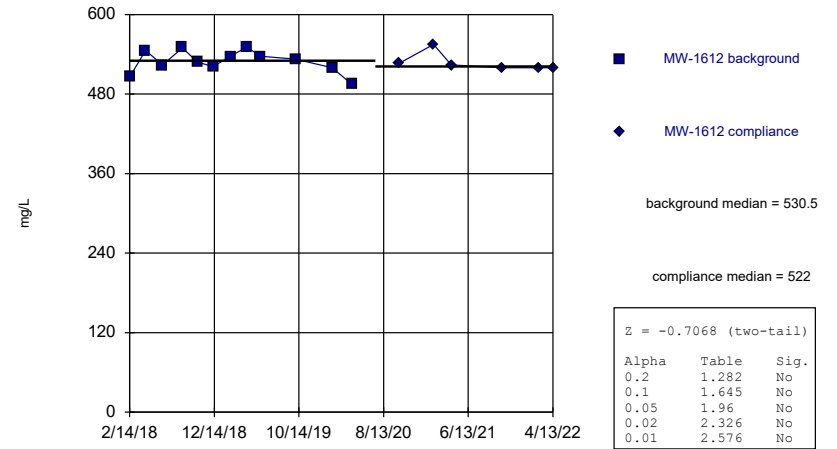
MW-1608 (bg)



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

MW-1612



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 12:48 PM View: Chattanooga Shale - Pond 1
Clinch River LF Client: AEP Data: Clinch River

Welch's t-test/Mann-Whitney - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:41 PM

<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Method</u>
Calcium total (mg/L)	MW-1607	-3.423	Yes	Mann-W

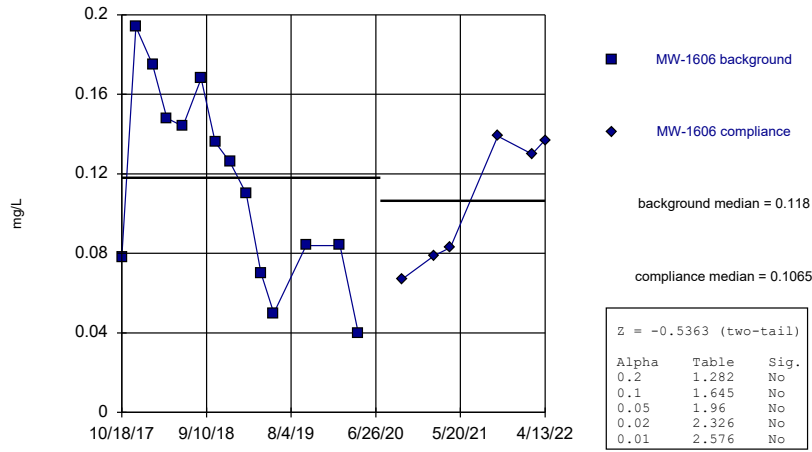
Welch's t-test/Mann-Whitney - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:41 PM

<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Method</u>
Boron total (mg/L)	MW-1606	-0.5363	No	Mann-W
Boron total (mg/L)	MW-1607	-1.529	No	Mann-W
Boron total (mg/L)	MW-1609 (bg)	-0.6774	No	Mann-W
Calcium total (mg/L)	MW-1606	0.5363	No	Mann-W
Calcium total (mg/L)	MW-1607	-3.423	Yes	Mann-W
Calcium total (mg/L)	MW-1609 (bg)	-0.1237	No	Mann-W
Fluoride total (mg/L)	MW-1606	-0.166	No	Mann-W
Fluoride total (mg/L)	MW-1607	0.4166	No	Mann-W
Fluoride total (mg/L)	MW-1609 (bg)	-1.325	No	Mann-W
pH [field] (std.units)	MW-1606	0.454	No	Mann-W
pH [field] (std.units)	MW-1607	-0.4951	No	Mann-W
pH [field] (std.units)	MW-1609 (bg)	0.7844	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1606	-0.1239	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1607	-2.111	No	Mann-W
Total Dissolved Solids (mg/L)	MW-1609 (bg)	-1.651	No	Mann-W

Mann-Whitney (Wilcoxon Rank Sum)

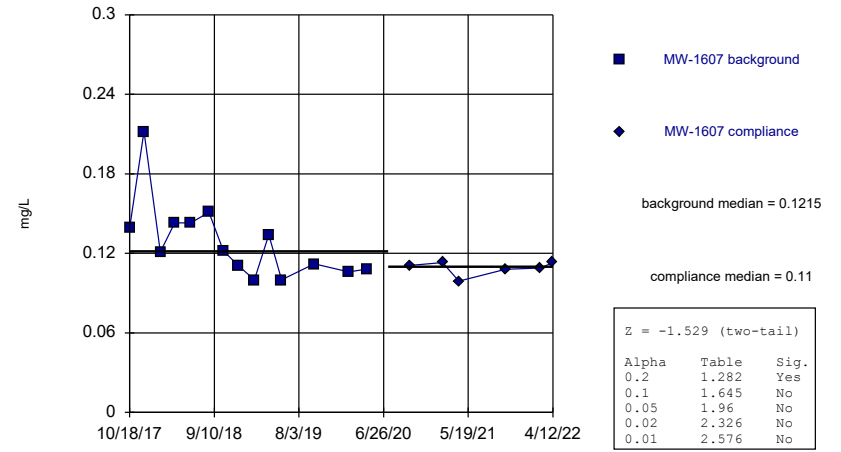
MW-1606



Constituent: Boron total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

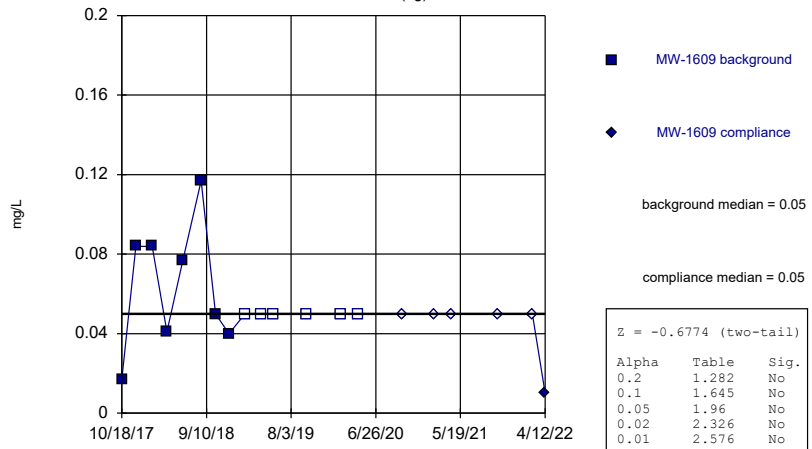
MW-1607



Constituent: Boron total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

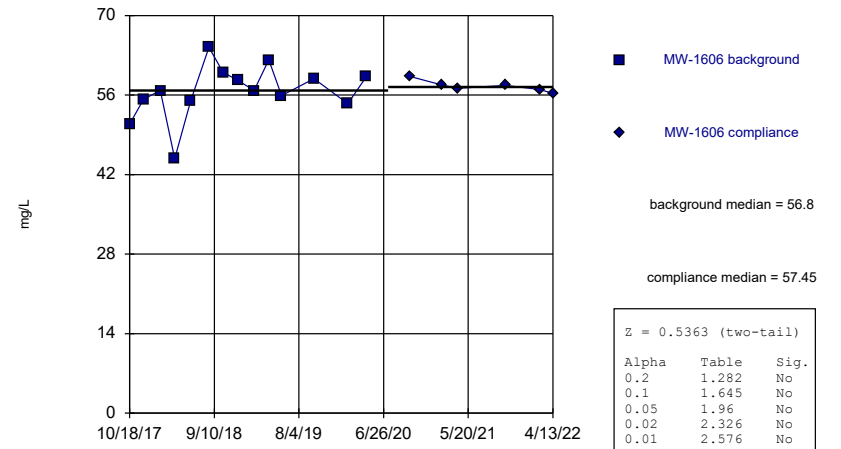
MW-1609 (bg)



Constituent: Boron total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

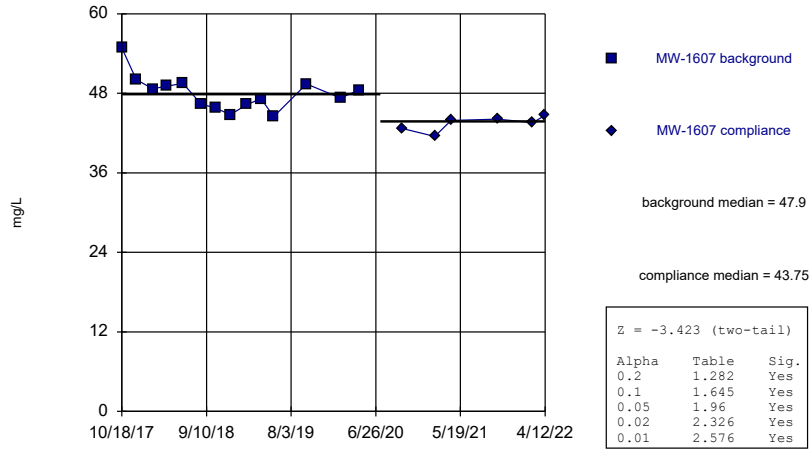
MW-1606



Constituent: Calcium total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

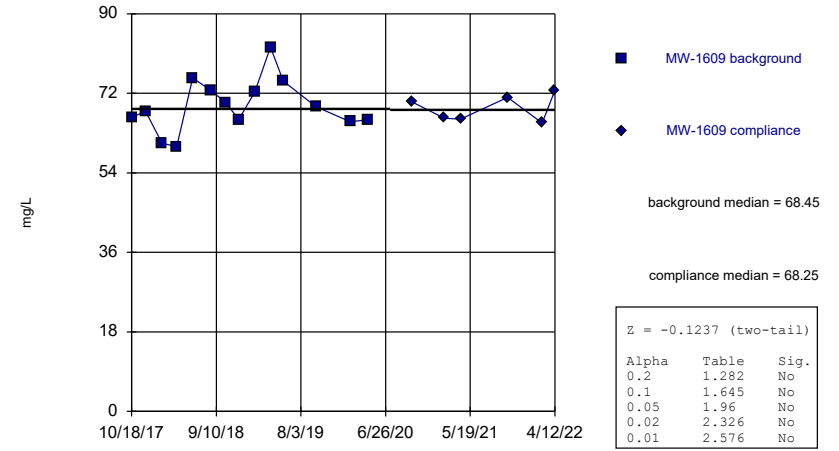
MW-1607



Constituent: Calcium total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

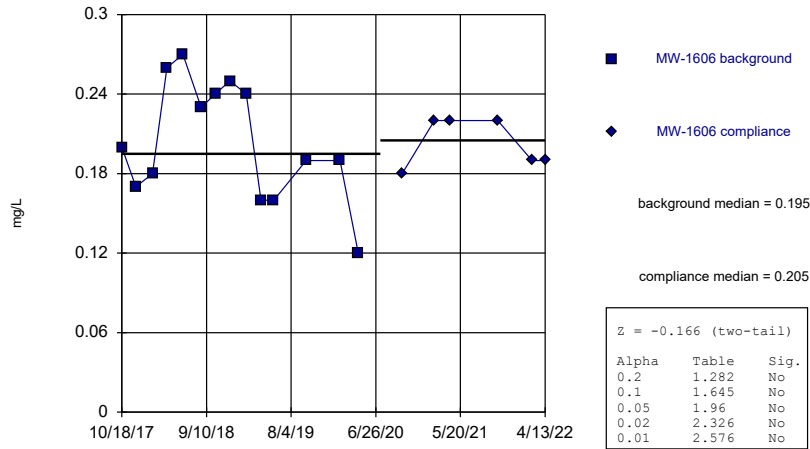
MW-1609 (bg)



Constituent: Calcium total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

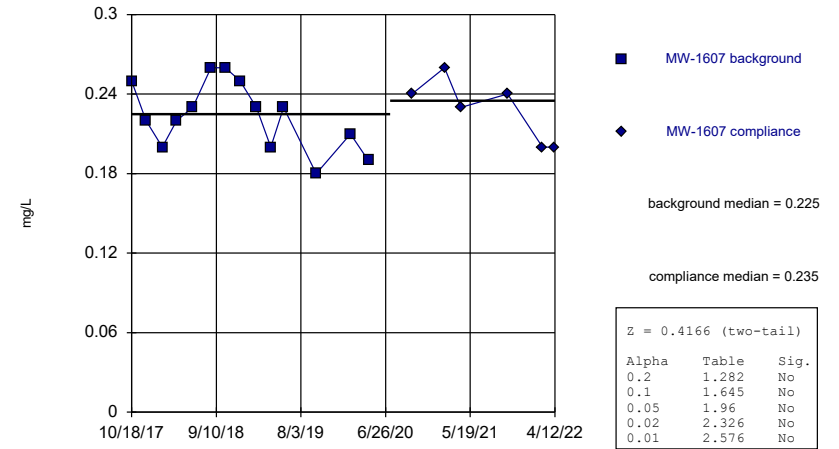
MW-1606



Constituent: Fluoride total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

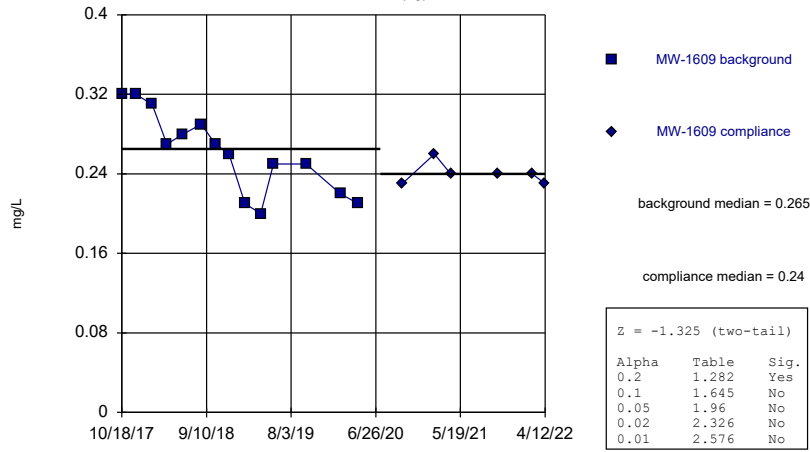
MW-1607



Constituent: Fluoride total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

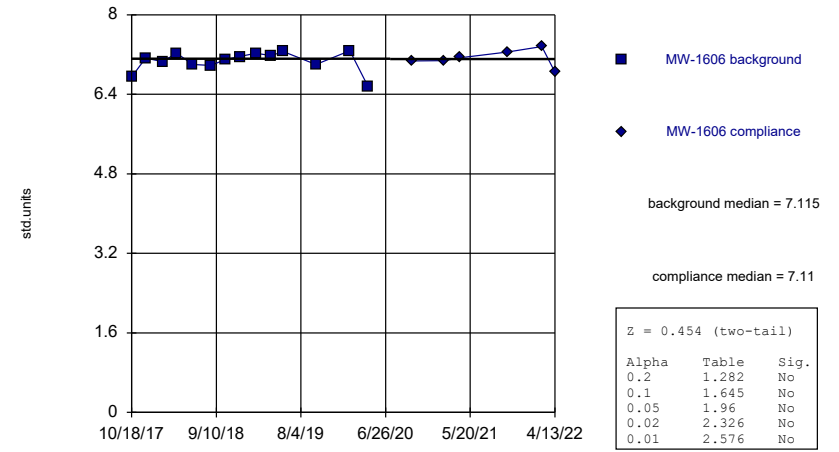
Mann-Whitney (Wilcoxon Rank Sum)

MW-1609 (bg)



Mann-Whitney (Wilcoxon Rank Sum)

MW-1606

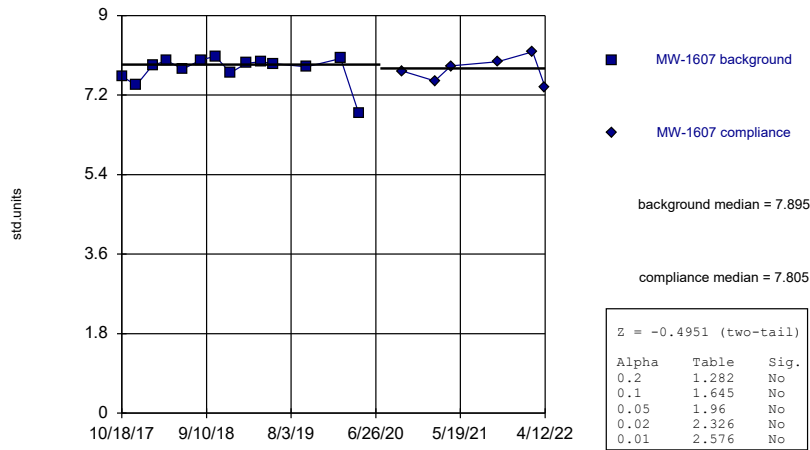


Constituent: Fluoride total Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

Constituent: pH [field] Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

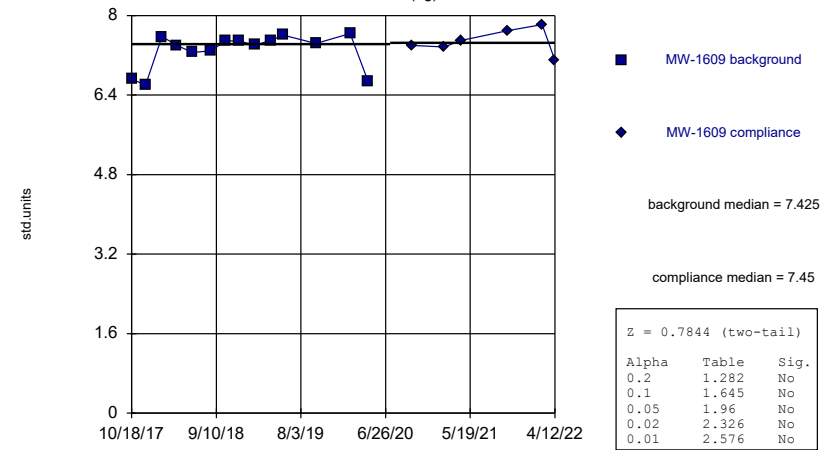
Mann-Whitney (Wilcoxon Rank Sum)

MW-1607



Mann-Whitney (Wilcoxon Rank Sum)

MW-1609 (bg)

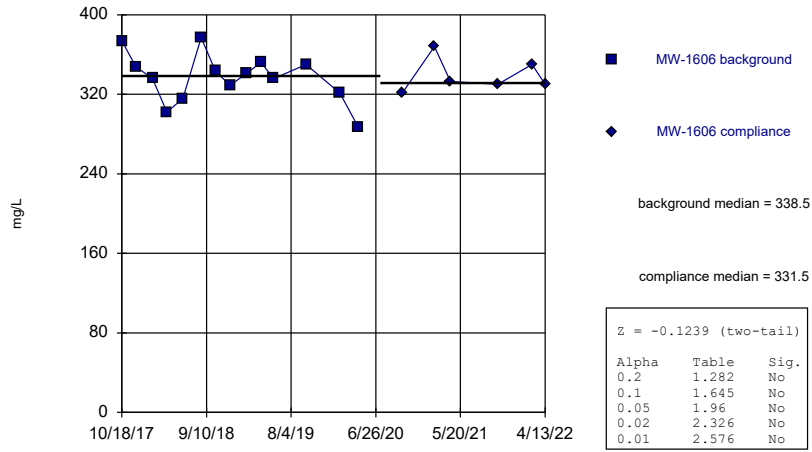


Constituent: pH [field] Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

Constituent: pH [field] Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intrawell
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

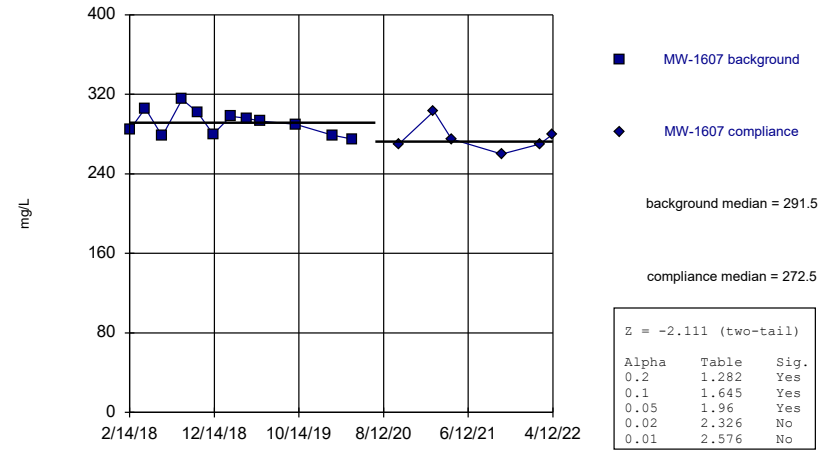
MW-1606



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intr
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

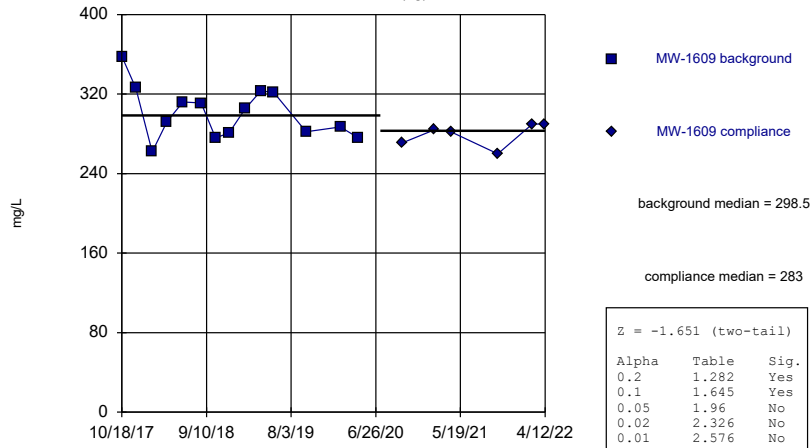
MW-1607



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intr
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

MW-1609 (bg)



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:40 PM View: Rome Limestone - Pond 1 Intr
Clinch River LF Client: AEP Data: Clinch River

Welch's t-test/Mann-Whitney - Dumps Fault - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 3:53 PM

<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Method</u>
Calcium total (mg/L)	MW-1610	-2.724	Yes	Mann-W
Calcium total (mg/L)	MW-1611 (bg)	-3.244	Yes	Mann-W
Chloride total (mg/L)	MW-1610	-3.512	Yes	Mann-W
Chloride total (mg/L)	MW-1611 (bg)	-3.241	Yes	Mann-W
Sulfate total (mg/L)	MW-1611 (bg)	-3.241	Yes	Mann-W
Total Dissolved Solids (mg/L)	MW-1610	-3.02	Yes	Mann-W
Total Dissolved Solids (mg/L)	MW-1611 (bg)	-3.253	Yes	Mann-W

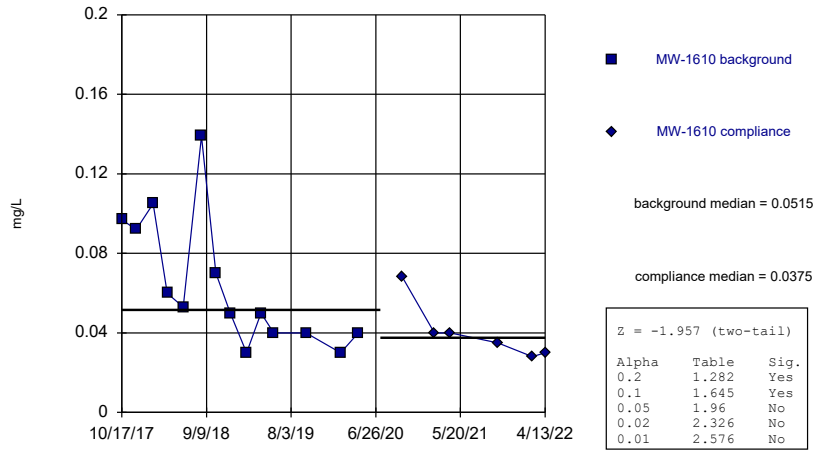
Welch's t-test/Mann-Whitney - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 3:53 PM

<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.01</u>	<u>Method</u>
Boron total (mg/L)	MW-1610	-1.957	No	Mann-W
Boron total (mg/L)	MW-1611 (bg)	-2.434	No	Mann-W
Calcium total (mg/L)	MW-1610	-2.724	Yes	Mann-W
Calcium total (mg/L)	MW-1611 (bg)	-3.244	Yes	Mann-W
Chloride total (mg/L)	MW-1610	-3.512	Yes	Mann-W
Chloride total (mg/L)	MW-1611 (bg)	-3.241	Yes	Mann-W
Fluoride total (mg/L)	MW-1610	1.292	No	Mann-W
Fluoride total (mg/L)	MW-1611 (bg)	2.518	No	Mann-W
pH [field] (std.units)	MW-1610	1.444	No	Mann-W
pH [field] (std.units)	MW-1611 (bg)	0.7019	No	Mann-W
Sulfate total (mg/L)	MW-1610	-2.516	No	Mann-W
Sulfate total (mg/L)	MW-1611 (bg)	-3.241	Yes	Mann-W
Total Dissolved Solids (mg/L)	MW-1610	-3.02	Yes	Mann-W
Total Dissolved Solids (mg/L)	MW-1611 (bg)	-3.253	Yes	Mann-W

Mann-Whitney (Wilcoxon Rank Sum)

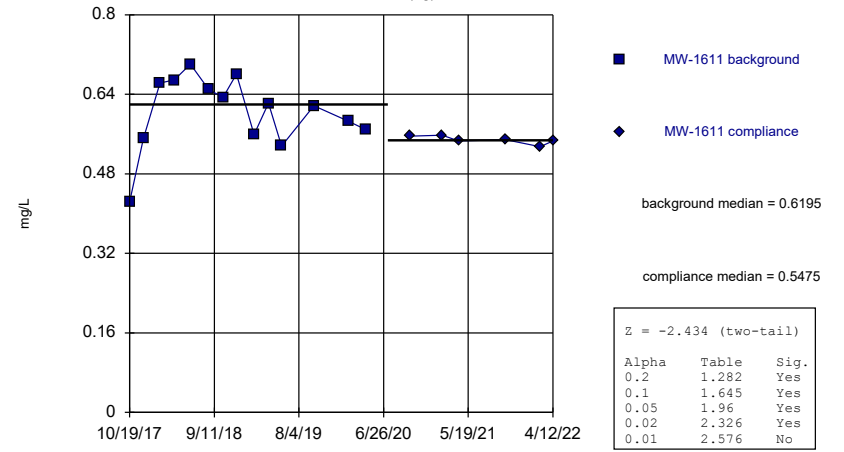
MW-1610



Constituent: Boron total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

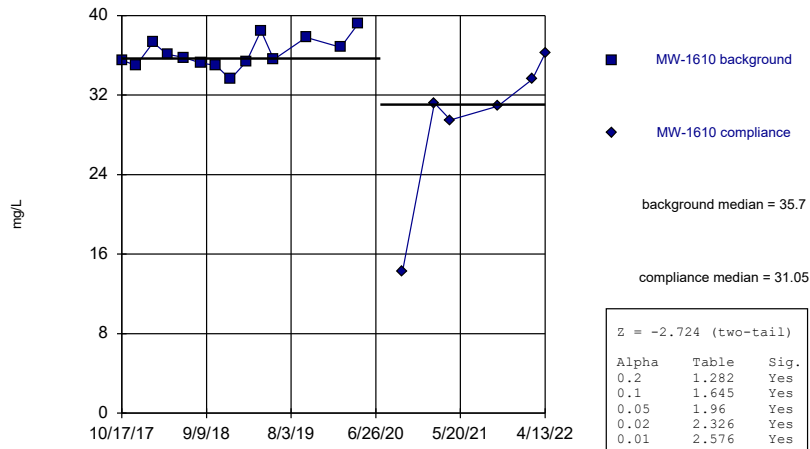
MW-1611 (bg)



Constituent: Boron total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

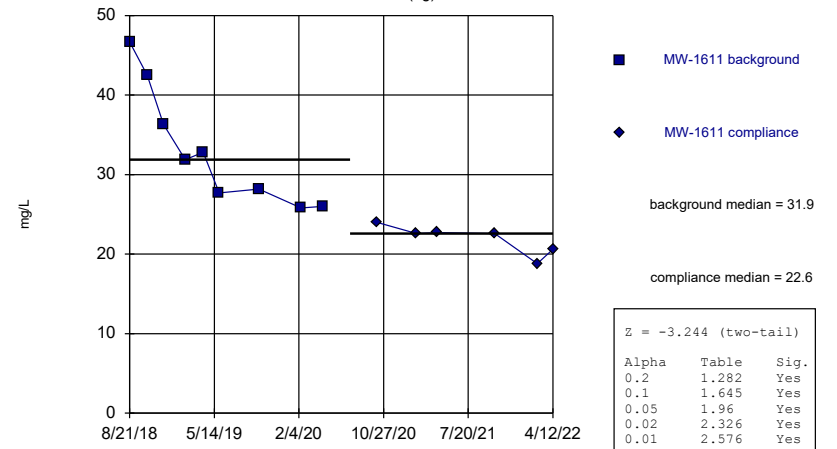
MW-1610



Constituent: Calcium total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

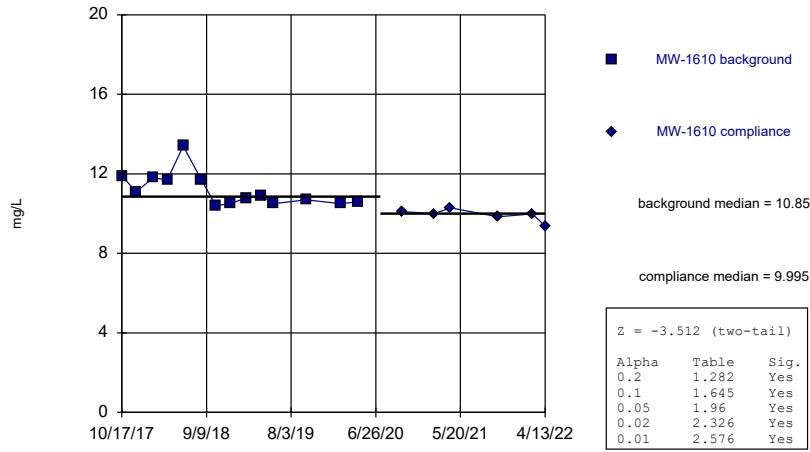
MW-1611 (bg)



Constituent: Calcium total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

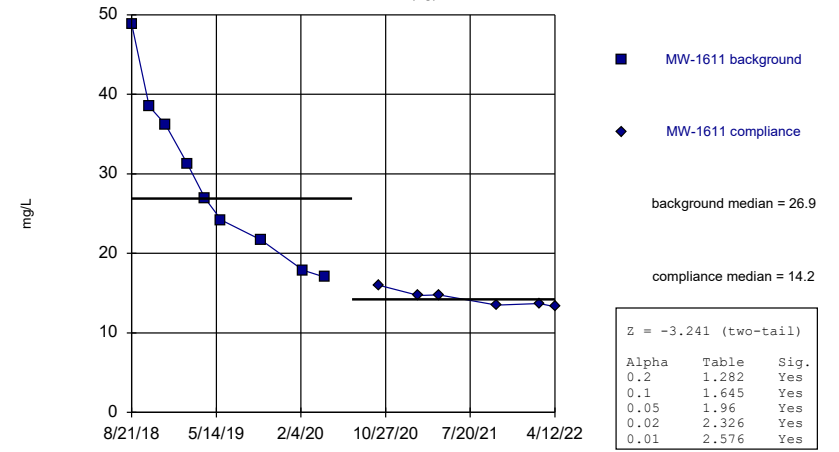
MW-1610



Constituent: Chloride total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

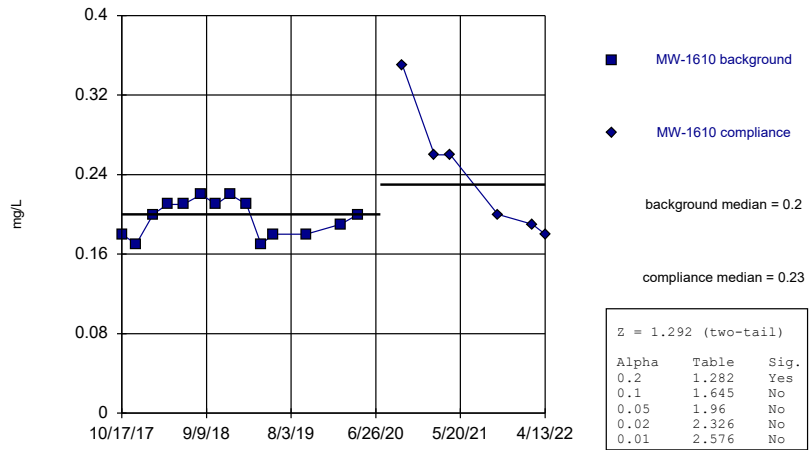
MW-1611 (bg)



Constituent: Chloride total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

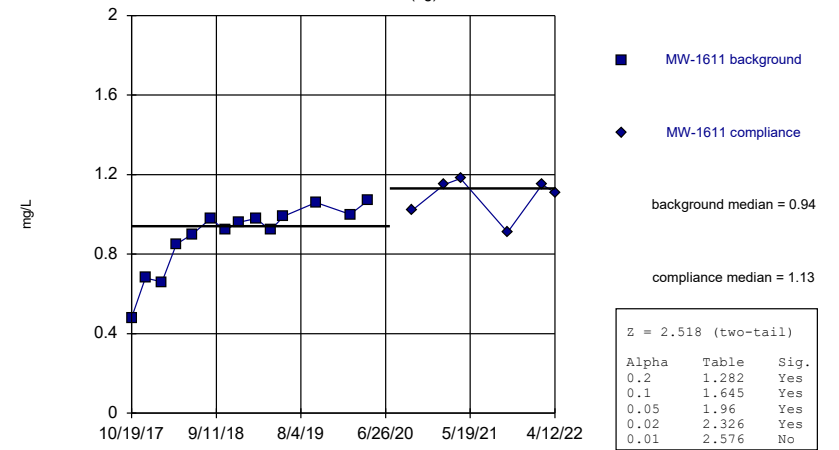
MW-1610



Constituent: Fluoride total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

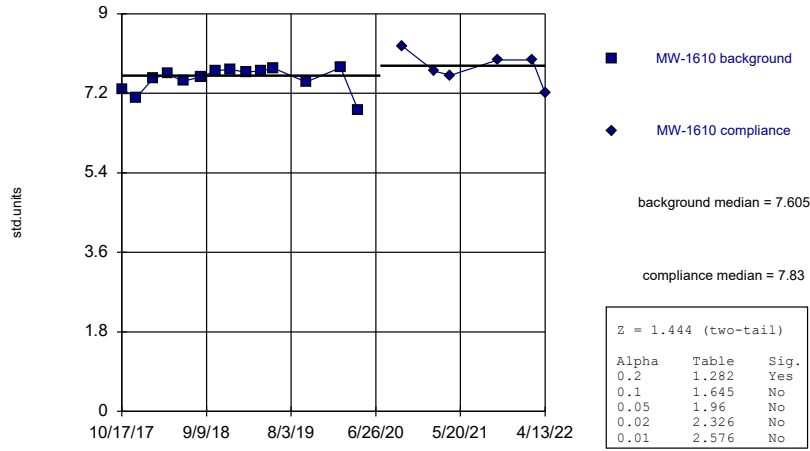
MW-1611 (bg)



Constituent: Fluoride total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

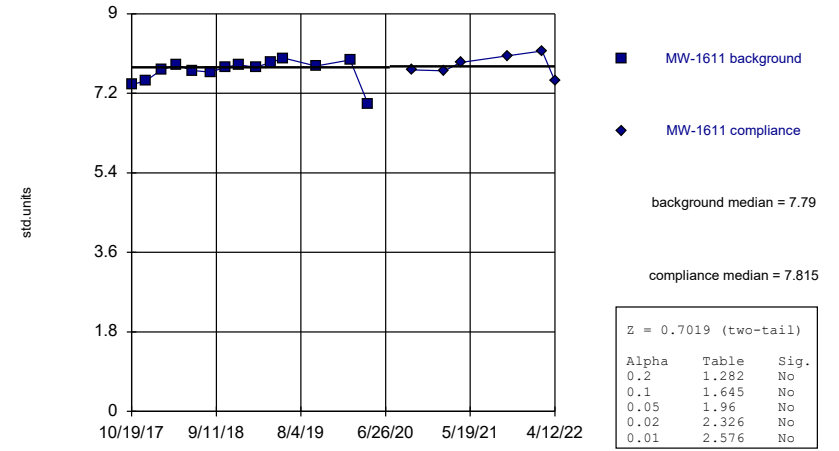
MW-1610



Constituent: pH [field] Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
 Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

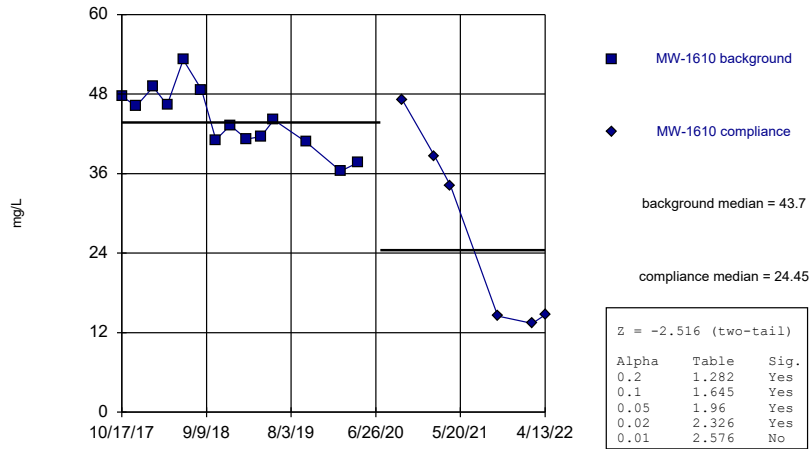
MW-1611 (bg)



Constituent: pH [field] Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
 Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

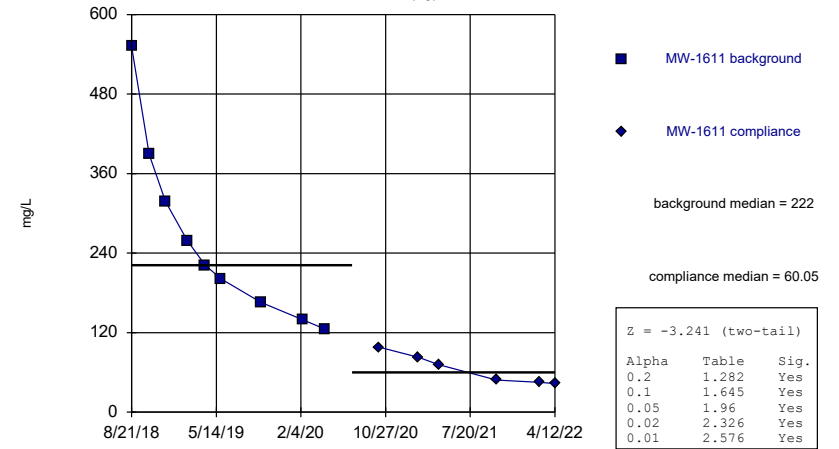
MW-1610



Constituent: Sulfate total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
 Clinch River LF Client: AEP Data: Clinch River

Mann-Whitney (Wilcoxon Rank Sum)

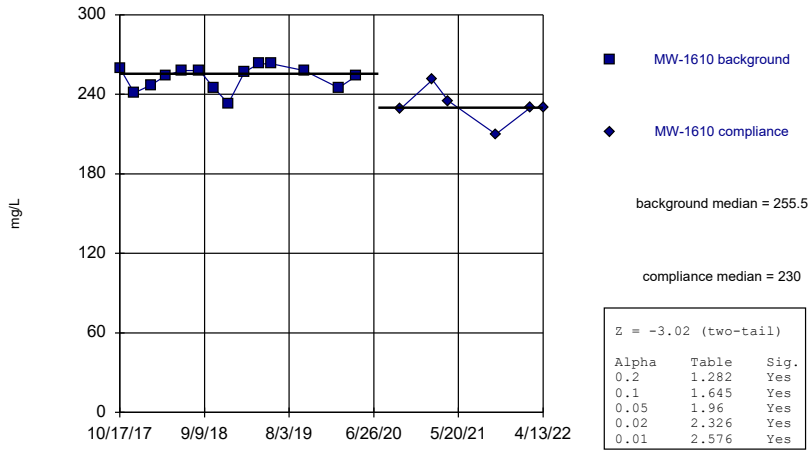
MW-1611 (bg)



Constituent: Sulfate total Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
 Clinch River LF Client: AEP Data: Clinch River

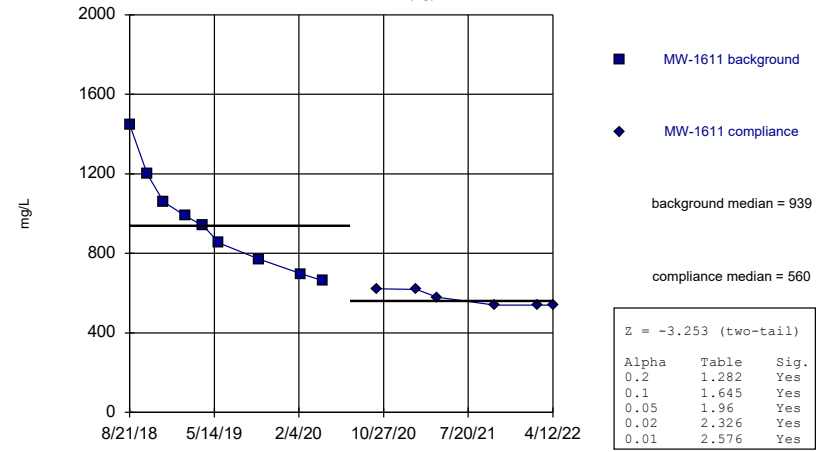
Mann-Whitney (Wilcoxon Rank Sum)

MW-1610



Mann-Whitney (Wilcoxon Rank Sum)

MW-1611 (bg)



Constituent: Total Dissolved Solids Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 3:51 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

FIGURE E.

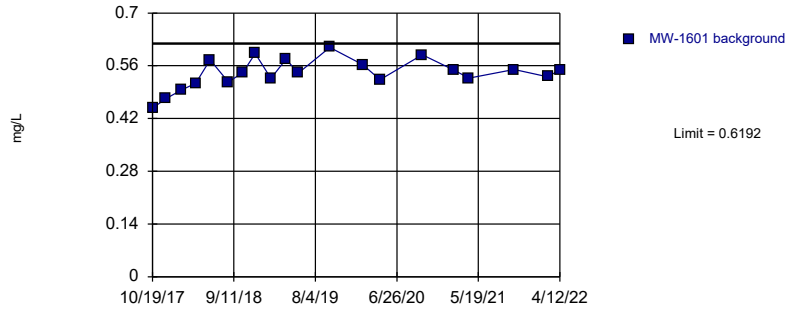
Intrawell Prediction Limits - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/27/2023, 12:50 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron total (mg/L)	MW-1601	0.6192	n/a	n/a	1 future	n/a	20	0.5396	0.04003	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1602	0.6766	n/a	n/a	1 future	n/a	20	0.6142	0.03137	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1603	0.4552	n/a	n/a	1 future	n/a	20	0.2826	0.08685	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1604	0.49	n/a	n/a	1 future	n/a	20	0.417	0.03672	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1605	0.699	n/a	n/a	1 future	n/a	20	n/a	n/a	0	n/a	n/a	0.004291	NP Intra (normality) 1 of 2
Boron total (mg/L)	MW-1608	0.385	n/a	n/a	1 future	n/a	20	0.3483	0.01848	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1612	0.5546	n/a	n/a	1 future	n/a	19	0.427	0.0635	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1601	2.548	n/a	n/a	1 future	n/a	20	2.156	0.1973	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1602	1.797	n/a	n/a	1 future	n/a	20	1.633	0.08284	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1603	0.1807	n/a	n/a	1 future	n/a	20	0.3532	0.03613	0	None	sqrt(x)	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1604	0.3514	n/a	n/a	1 future	n/a	20	0.2605	0.04571	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1605	0.4202	n/a	n/a	1 future	n/a	20	0.354	0.03331	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1608	0.4749	n/a	n/a	1 future	n/a	20	0.4265	0.02434	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1612	0.2376	n/a	n/a	1 future	n/a	19	0.1663	0.03547	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1601	334.9	n/a	n/a	1 future	n/a	20	218.6	58.5	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1602	37.84	n/a	n/a	1 future	n/a	20	24.44	6.741	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1603	3.106	n/a	n/a	1 future	n/a	8	1.31	0.6867	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1604	1.668	n/a	n/a	1 future	n/a	8	0.6525	0.3882	12.5	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1605	11.2	n/a	n/a	1 future	n/a	8	n/a	n/a	75	n/a	n/a	0.02144	NP Intra (NDs) 1 of 2
Sulfate total (mg/L)	MW-1608	184.1	n/a	n/a	1 future	n/a	20	170.8	6.703	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1612	1.403	n/a	n/a	1 future	n/a	8	0.526	0.2517	50	Kaplan-Meier	sqrt(x)	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1601	1663	n/a	n/a	1 future	n/a	20	1424	120.4	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1602	563	n/a	n/a	1 future	n/a	20	525.3	18.97	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1603	785.4	n/a	n/a	1 future	n/a	20	520.9	133.1	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1604	426.9	n/a	n/a	1 future	n/a	20	395.4	15.89	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1605	731.6	n/a	n/a	1 future	n/a	8	673.4	22.27	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1608	480.6	n/a	n/a	1 future	n/a	20	442.7	19.08	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1612	560.3	n/a	n/a	1 future	n/a	18	528.6	15.62	0	None	No	0.00188	Param Intra 1 of 2

Prediction Limit

Intrawell Parametric, MW-1601 (bg)

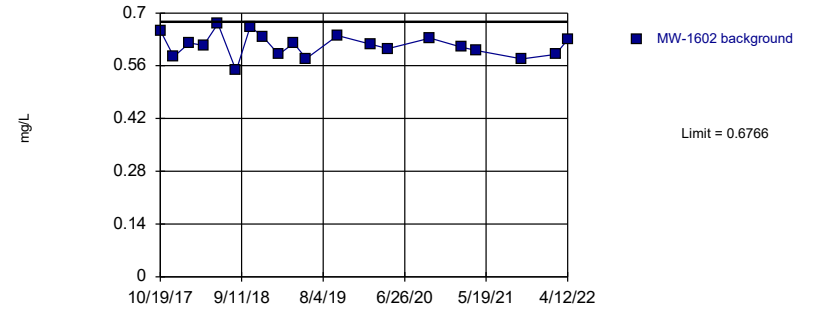


Background Data Summary: Mean=0.5396, Std. Dev.=0.04003, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9748, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/27/2023 12:48 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1602 (bg)

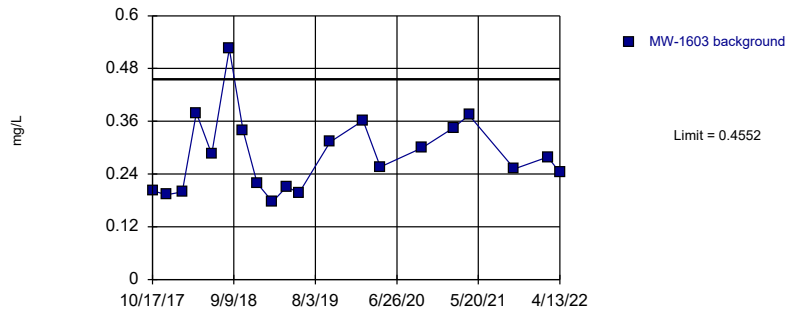


Background Data Summary: Mean=0.6142, Std. Dev.=0.03137, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9875, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/27/2023 12:48 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1603

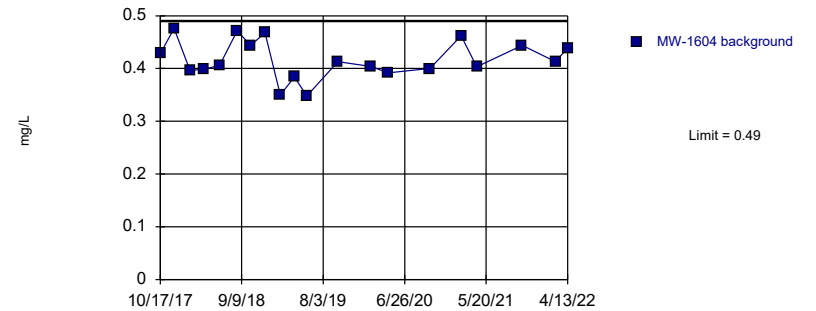


Background Data Summary: Mean=0.2826, Std. Dev.=0.08685, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9055, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/27/2023 12:48 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

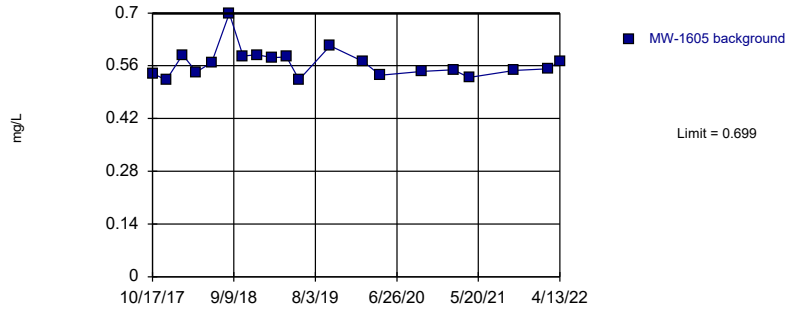
Intrawell Parametric, MW-1604



Background Data Summary: Mean=0.417, Std. Dev.=0.03672, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9485, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/27/2023 12:48 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

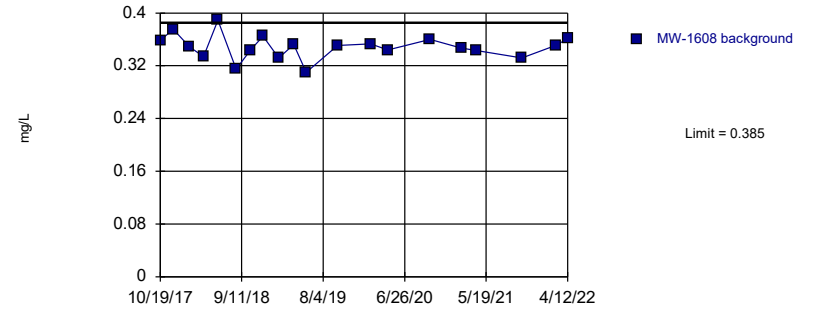
Prediction Limit
Intrawell Non-parametric, MW-1605



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 20 background values. Well-constituent pair annual alpha = 0.008564. Individual comparison alpha = 0.004291 (1 of 2). Assumes 1 future value.

Constituent: Boron total Analysis Run 1/27/2023 12:48 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

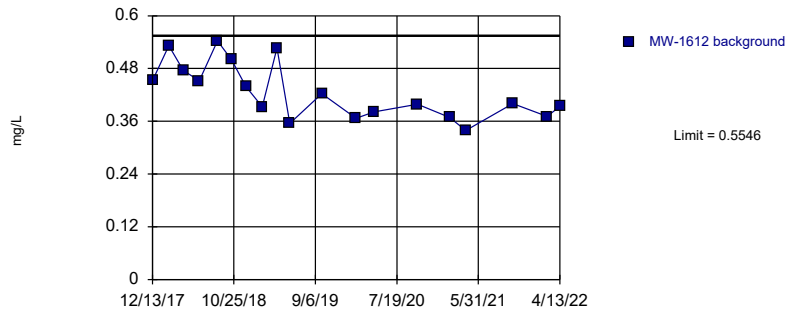
Prediction Limit
Intrawell Parametric, MW-1608 (bg)



Background Data Summary: Mean=0.3483, Std. Dev.=0.01848, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9707, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

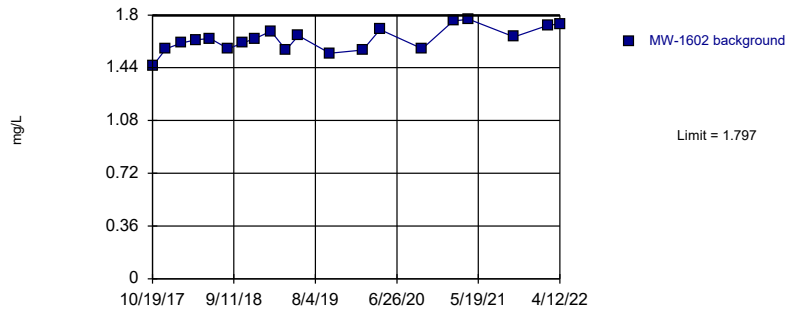
Constituent: Boron total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit
Intrawell Parametric, MW-1612



Prediction Limit

Intrawell Parametric, MW-1602 (bg)

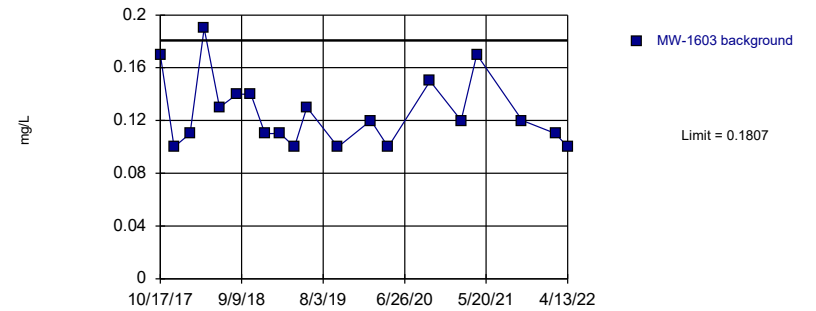


Background Data Summary: Mean=1.633, Std. Dev.=0.08284, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9668, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1603

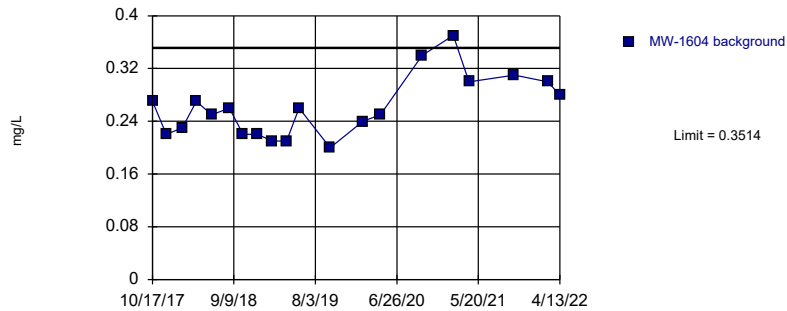


Background Data Summary (based on square root transformation): Mean=0.3532, Std. Dev.=0.03613, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8831, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1604

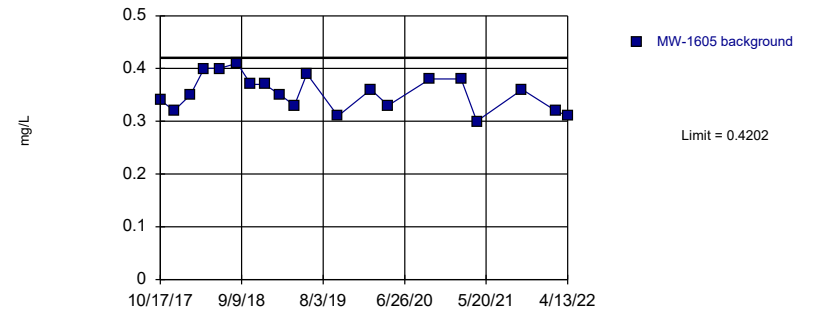


Background Data Summary: Mean=0.2605, Std. Dev.=0.04571, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9363, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1605

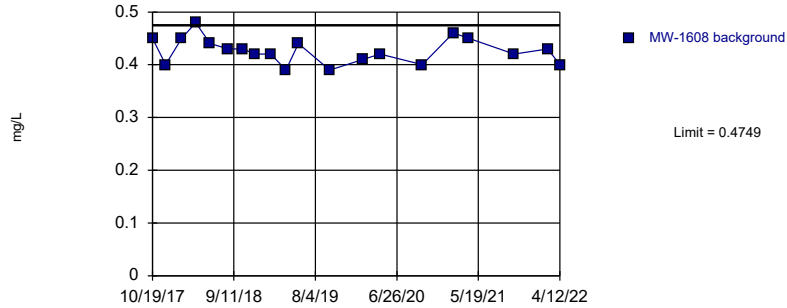


Background Data Summary: Mean=0.354, Std. Dev.=0.03331, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9591, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1608 (bg)

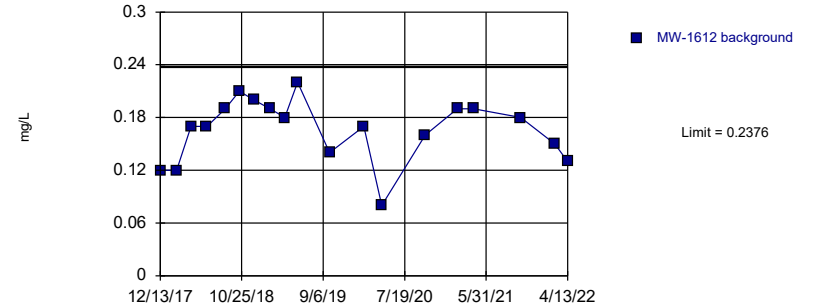


Background Data Summary: Mean=0.4265, Std. Dev.=0.02434, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9622, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1612

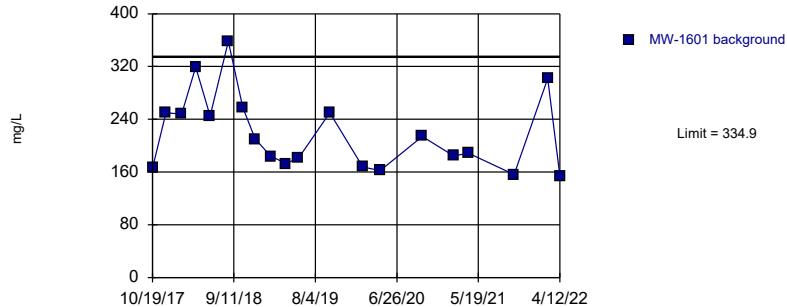


Background Data Summary: Mean=0.1663, Std. Dev.=0.03547, n=19. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9446, critical = 0.901. Kappa = 2.01 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1601 (bg)

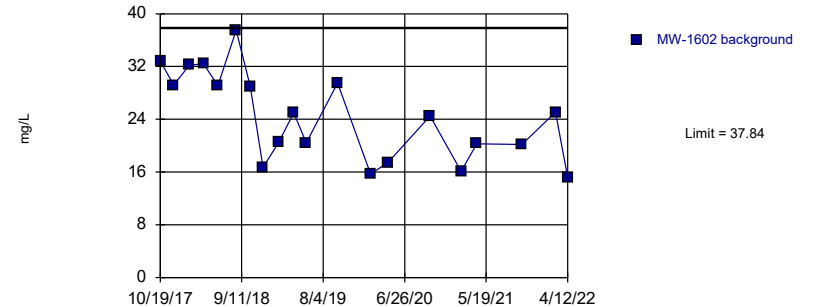


Background Data Summary: Mean=218.6, Std. Dev.=58.5, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8914, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1602 (bg)

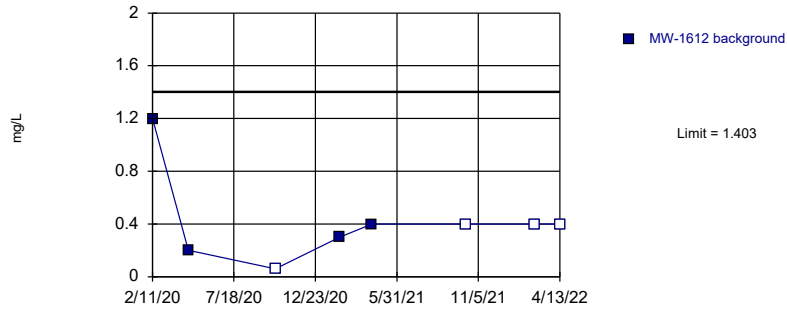


Background Data Summary: Mean=24.44, Std. Dev.=6.741, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9346, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1612

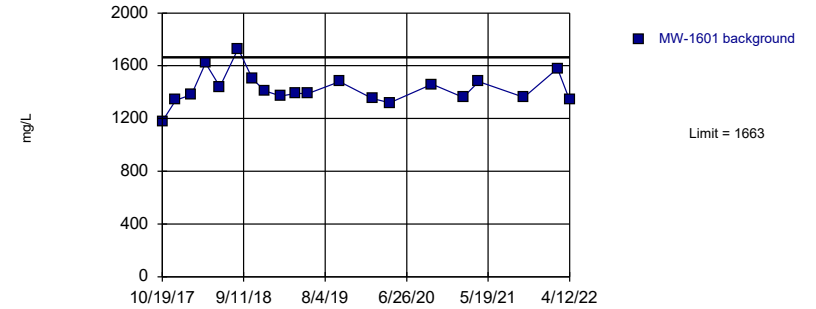


Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.526, Std. Dev.=0.2517, n=8, 50% NDs. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.8619, critical = 0.851. Kappa = 2.616 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1601 (bg)

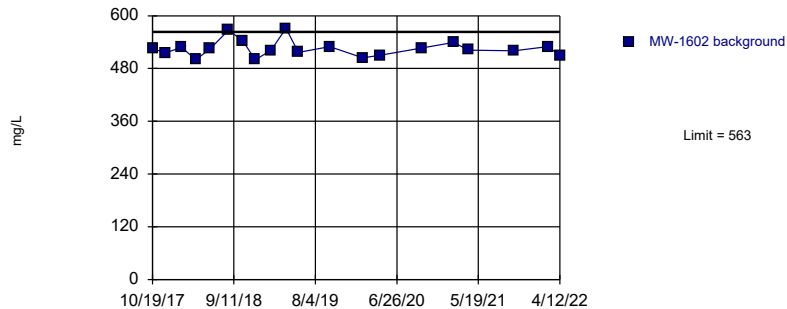


Background Data Summary: Mean=1424, Std. Dev.=120.4, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9291, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 I Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1602 (bg)

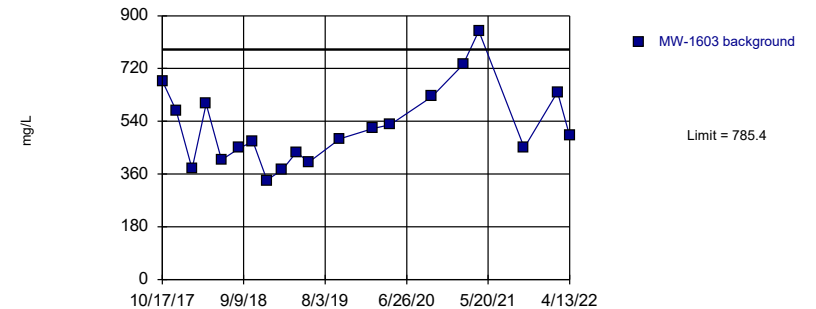


Background Data Summary: Mean=525.3, Std. Dev.=18.97, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9015, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 I Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1603

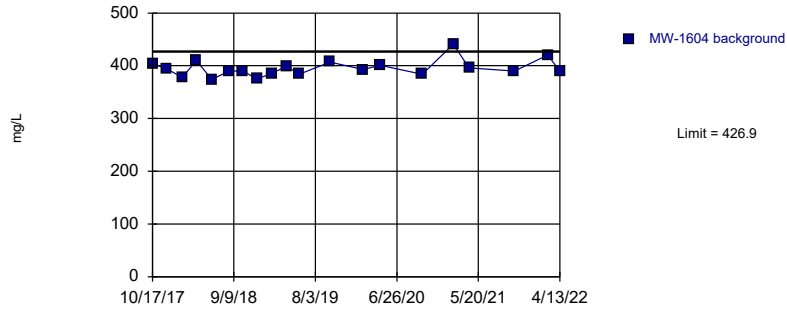


Background Data Summary: Mean=520.9, Std. Dev.=133.1, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9401, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 I Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1604

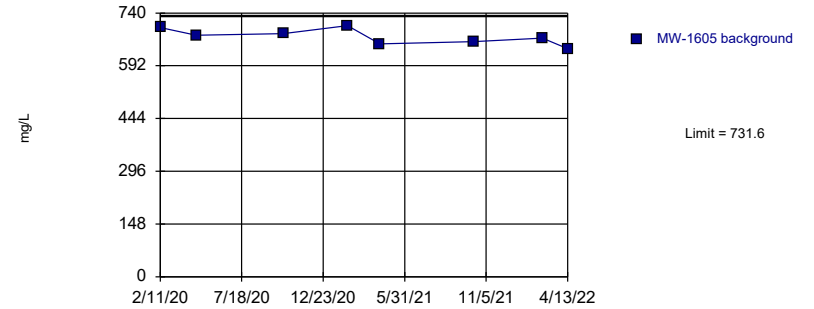


Background Data Summary: Mean=395.4, Std. Dev.=15.89, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9115, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 I
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1605

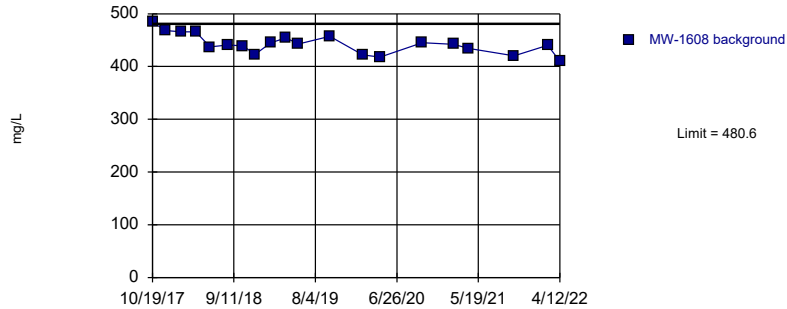


Background Data Summary: Mean=673.4, Std. Dev.=22.27, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.9748, critical = 0.851. Kappa = 2.616 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 I
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1608 (bg)

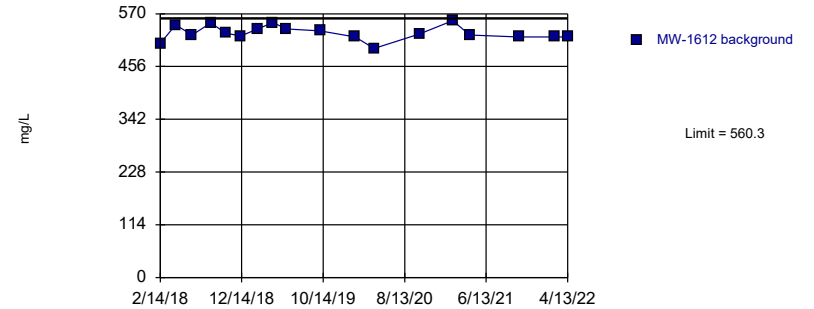


Background Data Summary: Mean=442.7, Std. Dev.=19.08, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9681, critical = 0.868. Kappa = 1.988 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 I
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1612



Background Data Summary: Mean=528.6, Std. Dev.=15.62, n=18. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9497, critical = 0.897. Kappa = 2.032 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:49 PM View: Chattanooga Shale - Pond 1 I
Clinch River LF Client: AEP Data: Clinch River

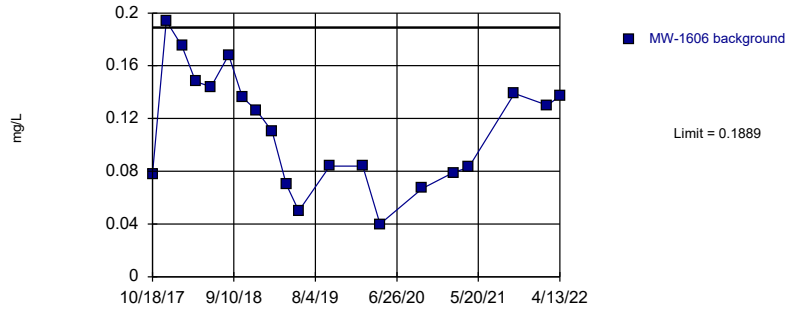
Intrawell Prediction Limits - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:49 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg. N	Bg. Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron total (mg/L)	MW-1606	0.1889	n/a	n/a	1 future	n/a	20	0.1121	0.04357	0	None	No	0.003756	Param Intra 1 of 2
Boron total (mg/L)	MW-1607	0.212	n/a	n/a	1 future	n/a	20	n/a	n/a	0	n/a	n/a	0.004291	NP Intra (normality) 1 of 2
Boron total (mg/L)	MW-1609	0.117	n/a	n/a	1 future	n/a	20	n/a	n/a	55	n/a	n/a	0.004291	NP Intra (NDs) 1 of 2
Calcium total (mg/L)	MW-1606	64.04	n/a	n/a	1 future	n/a	20	56.93	4.034	0	None	No	0.003756	Param Intra 1 of 2
Calcium total (mg/L)	MW-1607	52.2	n/a	n/a	1 future	n/a	20	46.65	3.148	0	None	No	0.003756	Param Intra 1 of 2
Calcium total (mg/L)	MW-1609	78.27	n/a	n/a	1 future	n/a	20	69.07	5.222	0	None	No	0.003756	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1606	0.2713	n/a	n/a	1 future	n/a	20	0.204	0.03817	0	None	No	0.003756	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1607	0.2683	n/a	n/a	1 future	n/a	20	0.225	0.0246	0	None	No	0.003756	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1609	0.3178	n/a	n/a	1 future	n/a	20	0.255	0.03561	0	None	No	0.003756	Param Intra 1 of 2
pH [field] (std.units)	MW-1606	7.422	6.745	n/a	1 future	n/a	20	7.084	0.1923	0	None	No	0.001878	Param Intra 1 of 2
pH [field] (std.units)	MW-1607	8.303	7.231	n/a	1 future	n/a	20	60.61	4.727	0	None	x^2	0.001878	Param Intra 1 of 2
pH [field] (std.units)	MW-1609	7.91	6.76	n/a	1 future	n/a	20	54.14	4.788	0	None	x^2	0.001878	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1606	376.7	n/a	n/a	1 future	n/a	20	337.3	22.4	0	None	No	0.003756	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1607	312.9	n/a	n/a	1 future	n/a	18	286.3	14.78	0	None	No	0.003756	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1609	337.8	n/a	n/a	1 future	n/a	20	294.5	24.57	0	None	No	0.003756	Param Intra 1 of 2

Prediction Limit

Intrawell Parametric, MW-1606

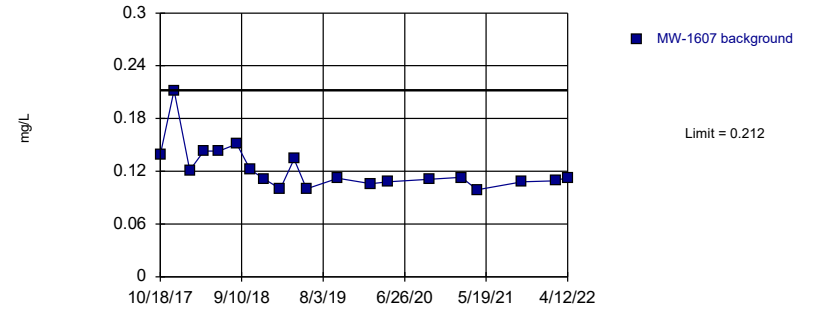


Background Data Summary: Mean=0.1121, Std. Dev.=0.04357, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9557, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Non-parametric, MW-1607

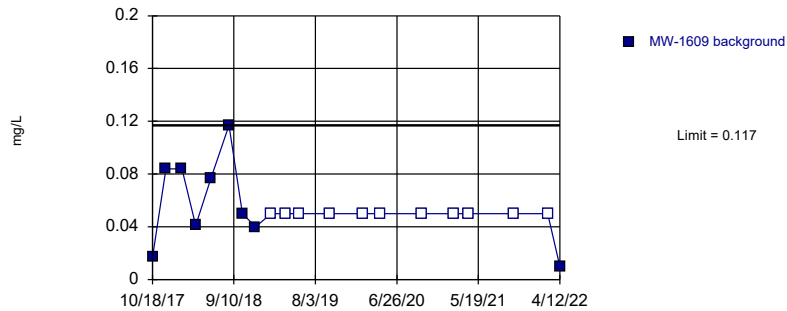


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 20 background values. Well-constituent pair annual alpha = 0.008564. Individual comparison alpha = 0.004291 (1 of 2). Assumes 1 future value.

Constituent: Boron total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Non-parametric, MW-1609 (bg)

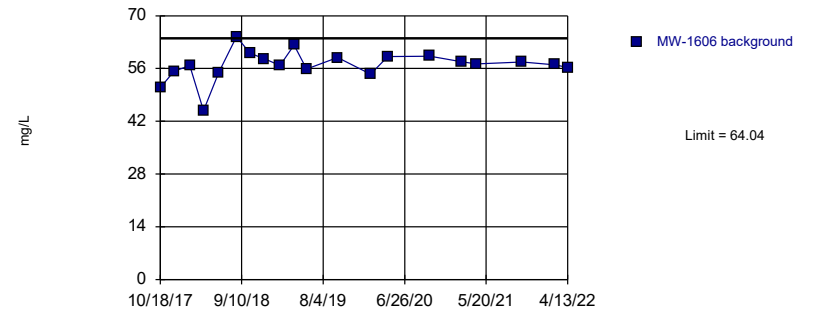


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 20 background values. 55% NDs. Well-constituent pair annual alpha = 0.008564. Individual comparison alpha = 0.004291 (1 of 2). Assumes 1 future value.

Constituent: Boron total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1606

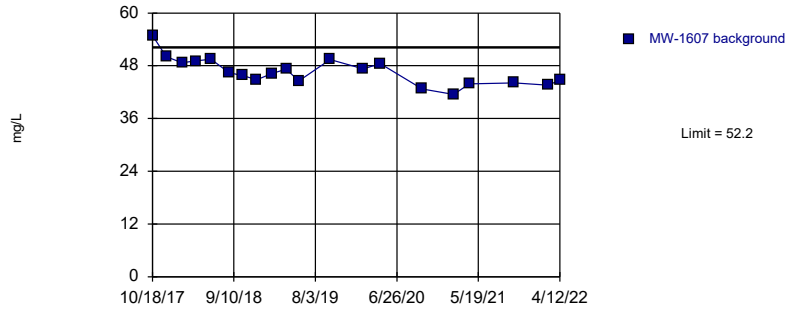


Background Data Summary: Mean=56.93, Std. Dev.=4.034, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8932, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1607

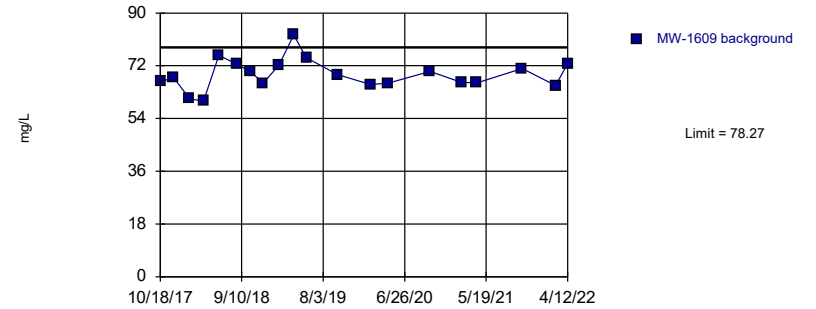


Background Data Summary: Mean=46.65, Std. Dev.=3.148, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9547, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1609 (bg)

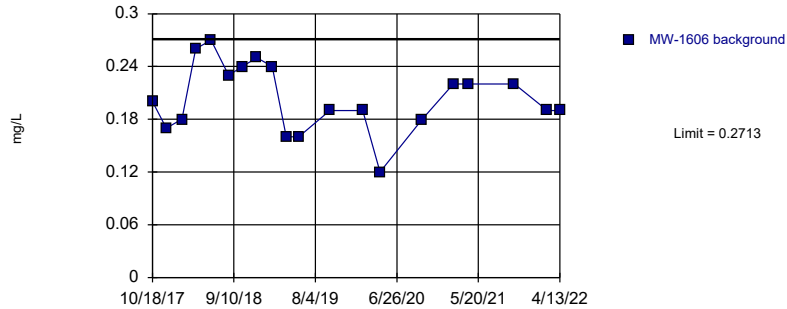


Background Data Summary: Mean=69.07, Std. Dev.=5.222, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9534, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1606

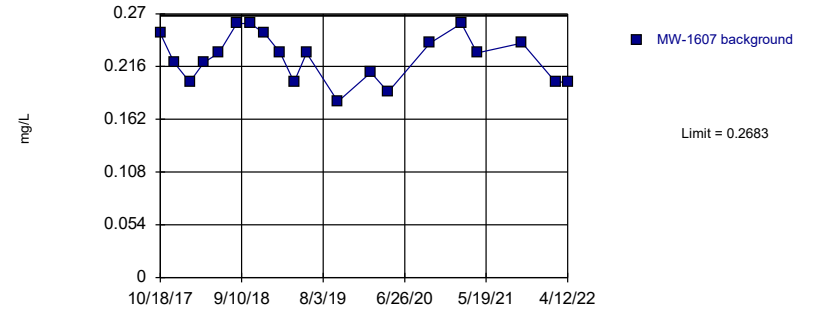


Background Data Summary: Mean=0.204, Std. Dev.=0.03817, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9736, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1607

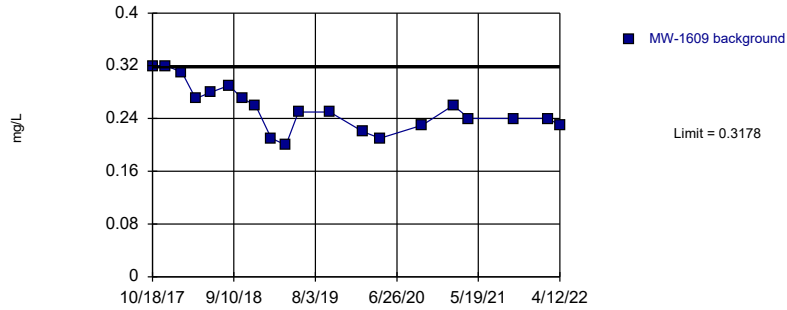


Background Data Summary: Mean=0.225, Std. Dev.=0.0246, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9424, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1609 (bg)

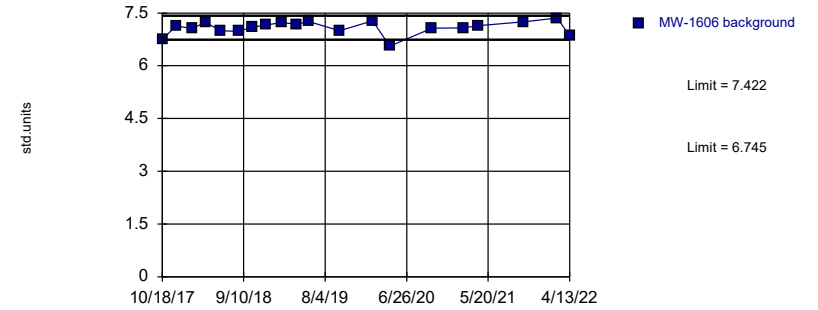


Background Data Summary: Mean=0.255, Std. Dev.=0.03561, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9517, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1606

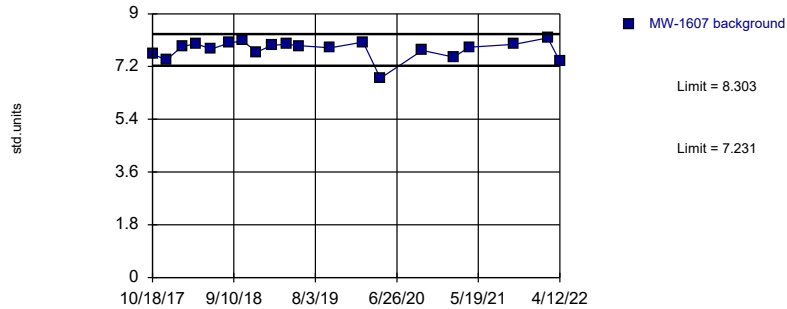


Background Data Summary: Mean=7.084, Std. Dev.=0.1923, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9136, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1607

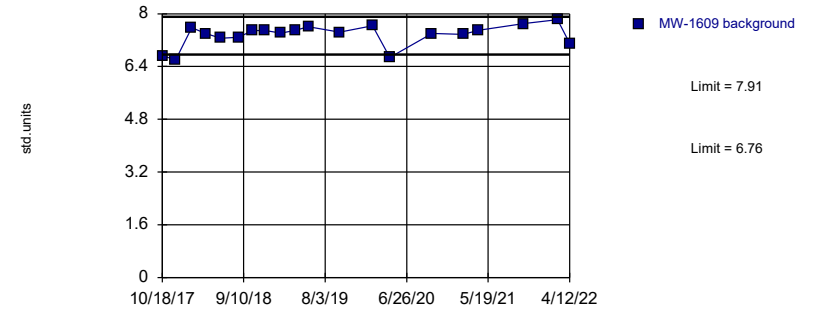


Background Data Summary (based on square transformation): Mean=60.61, Std. Dev.=4.727, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8706, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1609 (bg)

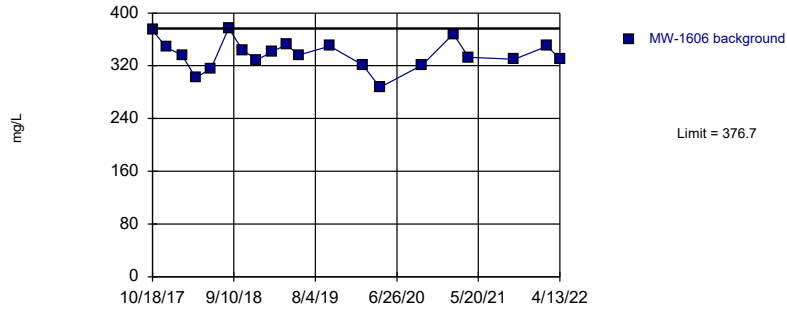


Background Data Summary (based on square transformation): Mean=54.14, Std. Dev.=4.788, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8726, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1606

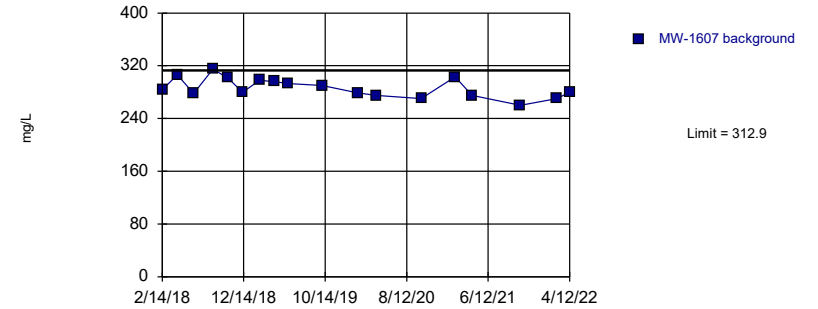


Background Data Summary: Mean=337.3, Std. Dev.=22.4, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.974, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intr Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1607

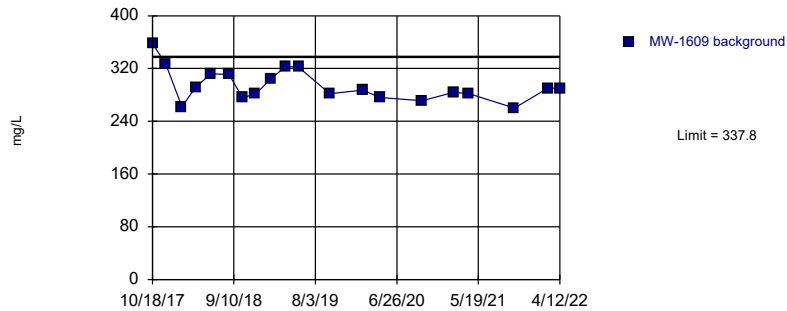


Background Data Summary: Mean=286.3, Std. Dev.=14.78, n=18. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9705, critical = 0.897. Kappa = 1.796 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intr Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1609 (bg)



Background Data Summary: Mean=294.5, Std. Dev.=24.57, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9297, critical = 0.868. Kappa = 1.762 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/24/2023 2:48 PM View: Rome Limestone - Pond 1 Intr Clinch River LF Client: AEP Data: Clinch River

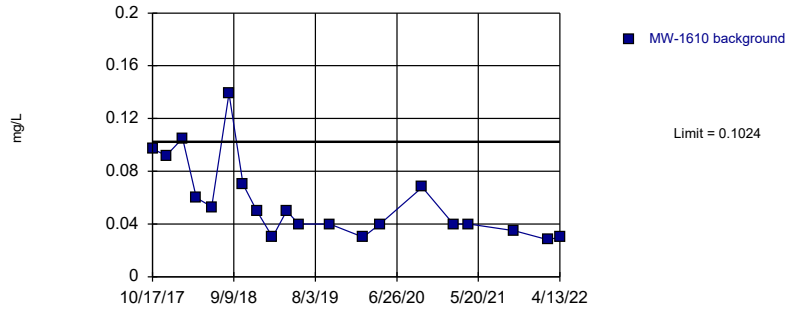
Intrawell Prediction Limits - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/27/2023, 12:47 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron total (mg/L)	MW-1610	0.1024	n/a	n/a	1 future	n/a	20	0.2317	0.05785	0	None	sqrt(x)	0.007498	Param Intra 1 of 2
Boron total (mg/L)	MW-1611	0.6889	n/a	n/a	1 future	n/a	20	0.5876	0.06643	0	None	No	0.007498	Param Intra 1 of 2
Calcium total (mg/L)	MW-1610	39.47	n/a	n/a	1 future	n/a	20	42064	12738	0	None	x^3	0.007498	Param Intra 1 of 2
Calcium total (mg/L)	MW-1611	27.47	n/a	n/a	1 future	n/a	8	22.89	2.436	0	None	No	0.007498	Param Intra 1 of 2
Chloride total (mg/L)	MW-1610	12.21	n/a	n/a	1 future	n/a	20	10.81	0.9226	0	None	No	0.007498	Param Intra 1 of 2
Chloride total (mg/L)	MW-1611	18.31	n/a	n/a	1 future	n/a	8	15.11	1.702	0	None	No	0.007498	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1610	0.35	n/a	n/a	1 future	n/a	20	n/a	n/a	0	n/a	n/a	0.004291	NP Intra (normality) 1 of 2
Fluoride total (mg/L)	MW-1611	1.217	n/a	n/a	1 future	n/a	20	0.9485	0.1762	0	None	No	0.007498	Param Intra 1 of 2
pH [field] (std.units)	MW-1610	8.095	7.105	n/a	1 future	n/a	20	7.6	0.3241	0	None	No	0.003749	Param Intra 1 of 2
pH [field] (std.units)	MW-1611	8.153	7.343	n/a	1 future	n/a	20	7.748	0.2652	0	None	No	0.003749	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1610	52.8	n/a	n/a	1 future	n/a	20	1651	745	0	None	x^2	0.007498	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1611	150.8	n/a	n/a	1 future	n/a	8	81.64	36.81	0	None	No	0.007498	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1610	267.9	n/a	n/a	1 future	n/a	20	246.1	14.32	0	None	No	0.007498	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1611	713	n/a	n/a	1 future	n/a	8	600	60.12	0	None	No	0.007498	Param Intra 1 of 2

Prediction Limit

Intrawell Parametric, MW-1610

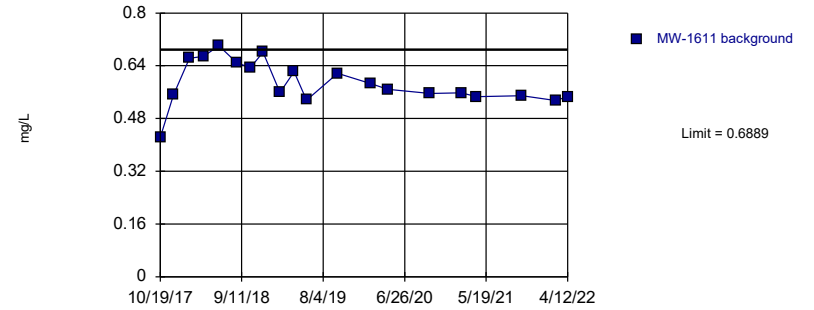


Background Data Summary (based on square root transformation): Mean=0.2317, Std. Dev.=0.05785, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.887, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1611 (bg)

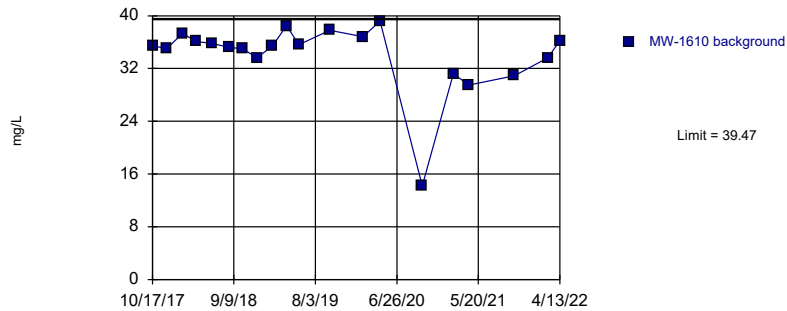


Background Data Summary: Mean=0.5876, Std. Dev.=0.06643, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9265, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1610

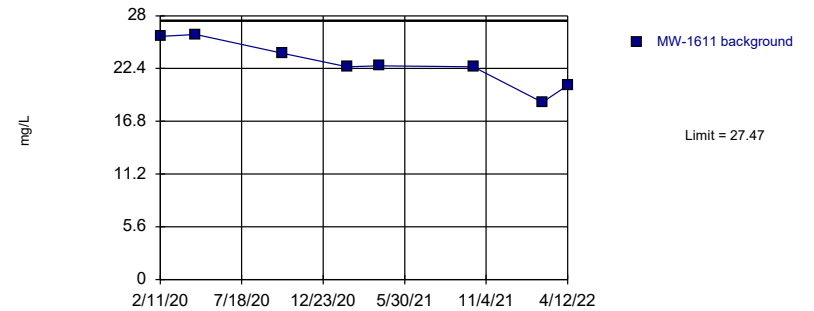


Background Data Summary (based on cube transformation): Mean=42064, Std. Dev.=12738, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8769, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1611 (bg)

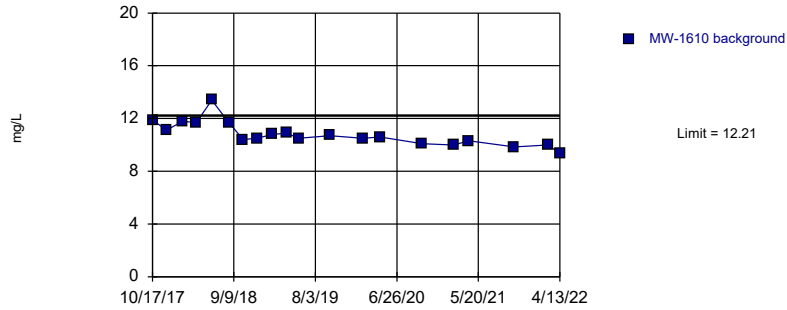


Background Data Summary: Mean=22.89, Std. Dev.=2.436, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.9409, critical = 0.851. Kappa = 1.88 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1610

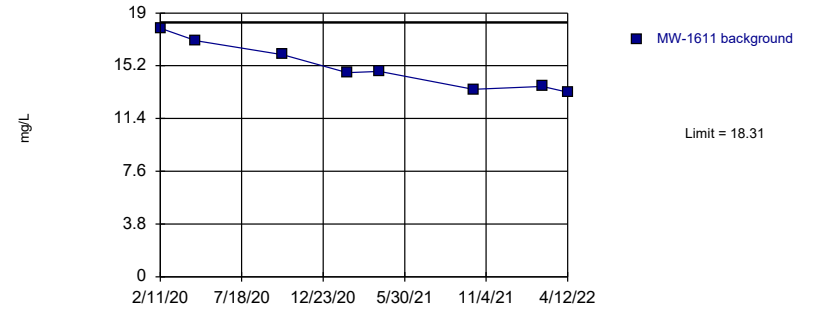


Background Data Summary: Mean=10.81, Std. Dev.=0.9226, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9148, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Chloride total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLS
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1611 (bg)

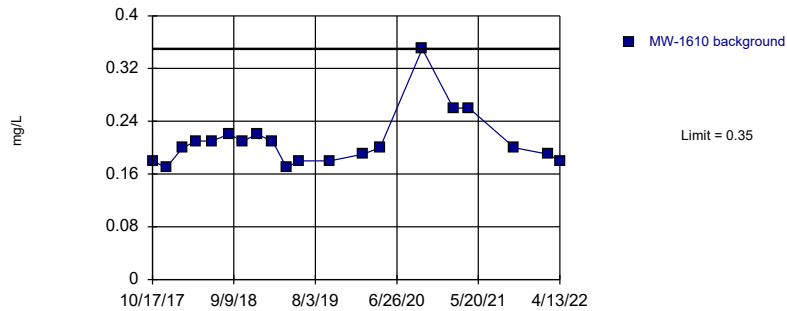


Background Data Summary: Mean=15.11, Std. Dev.=1.702, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.9113, critical = 0.851. Kappa = 1.88 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Chloride total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLS
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Non-parametric, MW-1610

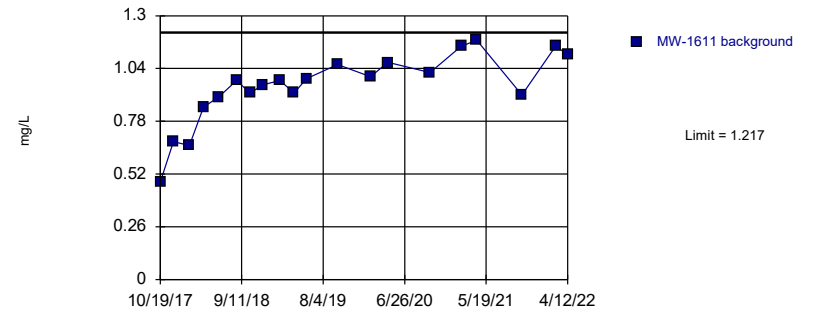


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 20 background values. Well-constituent pair annual alpha = 0.008564. Individual comparison alpha = 0.004291 (1 of 2). Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLS
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1611 (bg)

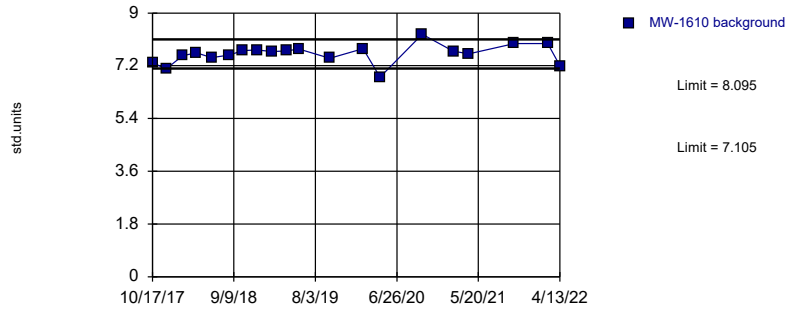


Background Data Summary: Mean=0.9485, Std. Dev.=0.1762, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9019, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLS
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1610

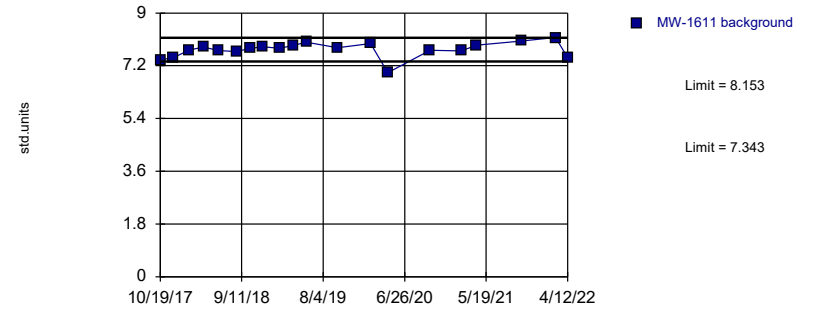


Background Data Summary: Mean=7.6, Std. Dev.=0.3241, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9565, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1611 (bg)

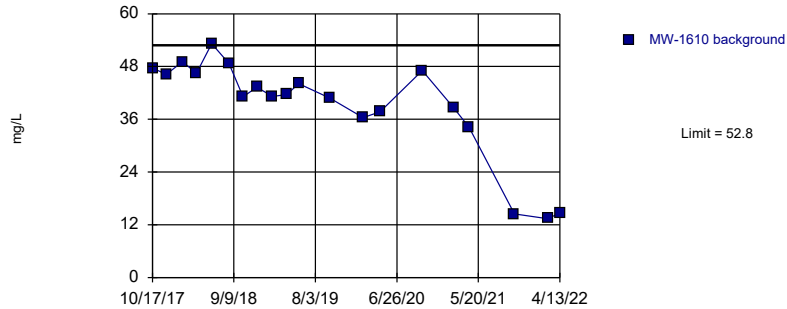


Background Data Summary: Mean=7.748, Std. Dev.=0.2652, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9008, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1610

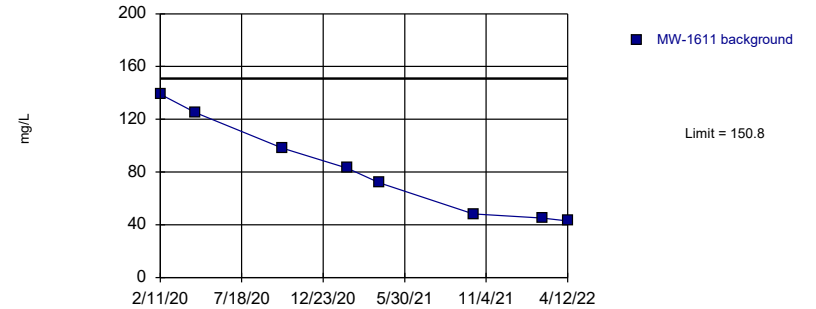


Background Data Summary (based on square transformation): Mean=1651, Std. Dev.=745, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.903, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1611 (bg)

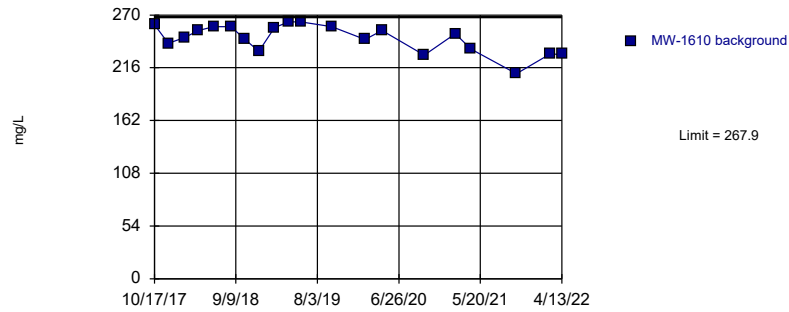


Background Data Summary: Mean=81.64, Std. Dev.=36.81, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.9066, critical = 0.851. Kappa = 1.88 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1610

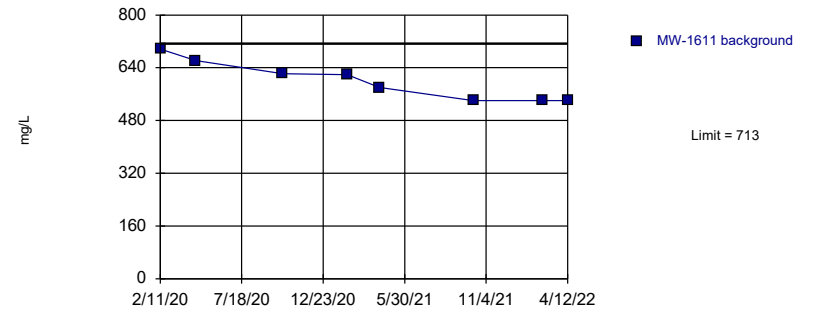


Background Data Summary: Mean=246.1, Std. Dev.=14.32, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9096, critical = 0.868. Kappa = 1.526 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit

Intrawell Parametric, MW-1611 (bg)



Background Data Summary: Mean=600, Std. Dev.=60.12, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.8906, critical = 0.851. Kappa = 1.88 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Total Dissolved Solids Analysis Run 1/27/2023 12:46 PM View: Dumps Fault - Pond 1 PLs
Clinch River LF Client: AEP Data: Clinch River

FIGURE F.

Upgradient Trend Tests - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:52 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Calcium total (mg/L)	MW-1602 (bg)	0.2932	99	87	Yes	21	0	n/a	n/a	0.01	NP
Calcium total (mg/L)	MW-1608 (bg)	-0.1611	-105	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride total (mg/L)	MW-1601 (bg)	-3.112	-105	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride total (mg/L)	MW-1608 (bg)	-0.5443	-138	-87	Yes	21	0	n/a	n/a	0.01	NP

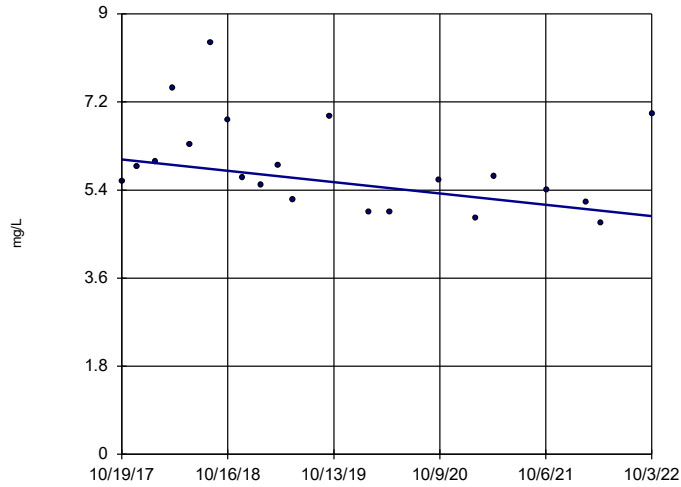
Upgradient Trend Tests - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 12:52 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Calcium total (mg/L)	MW-1601 (bg)	-0.2327	-68	-87	No	21	0	n/a	n/a	0.01	NP
Calcium total (mg/L)	MW-1602 (bg)	0.2932	99	87	Yes	21	0	n/a	n/a	0.01	NP
Calcium total (mg/L)	MW-1608 (bg)	-0.1611	-105	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride total (mg/L)	MW-1601 (bg)	-3.112	-105	-87	Yes	21	0	n/a	n/a	0.01	NP
Chloride total (mg/L)	MW-1602 (bg)	-0.09489	-23	-87	No	21	0	n/a	n/a	0.01	NP
Chloride total (mg/L)	MW-1608 (bg)	-0.5443	-138	-87	Yes	21	0	n/a	n/a	0.01	NP
pH [field] (std.units)	MW-1601 (bg)	0.04357	28	87	No	21	0	n/a	n/a	0.01	NP
pH [field] (std.units)	MW-1602 (bg)	-0.03408	-31	-87	No	21	0	n/a	n/a	0.01	NP
pH [field] (std.units)	MW-1608 (bg)	-0.03644	-58	-87	No	21	0	n/a	n/a	0.01	NP

Sen's Slope Estimator

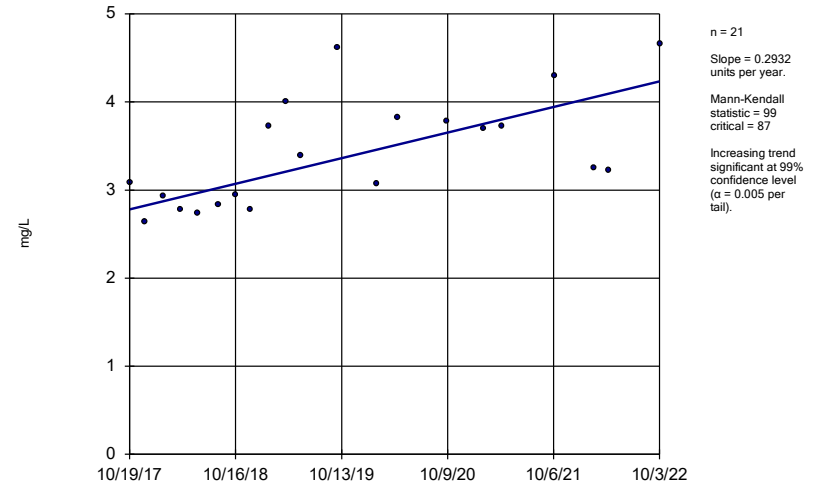
MW-1601 (bg)



Constituent: Calcium total Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradie Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

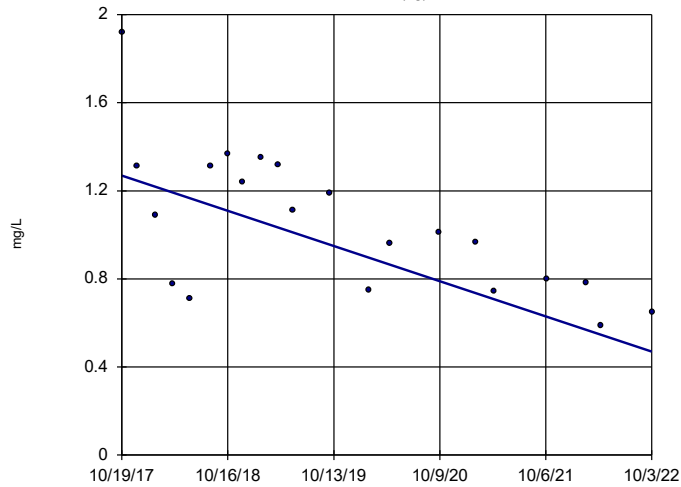
MW-1602 (bg)



Constituent: Calcium total Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradie Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

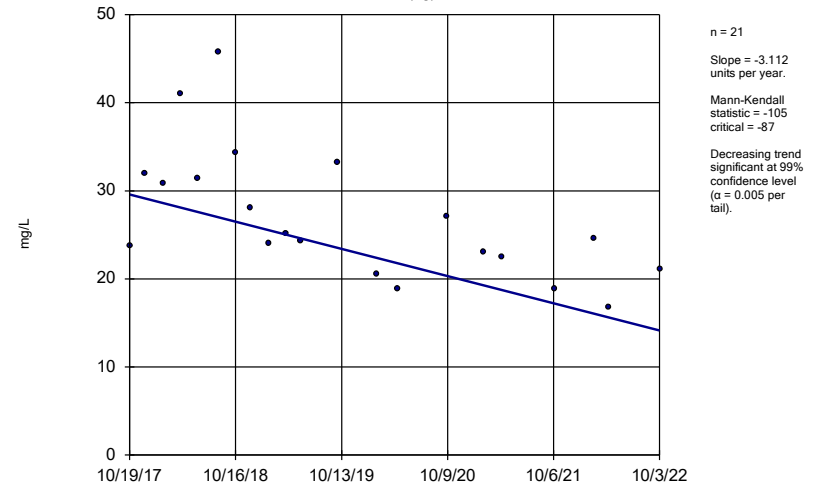
MW-1608 (bg)



Constituent: Calcium total Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradie Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

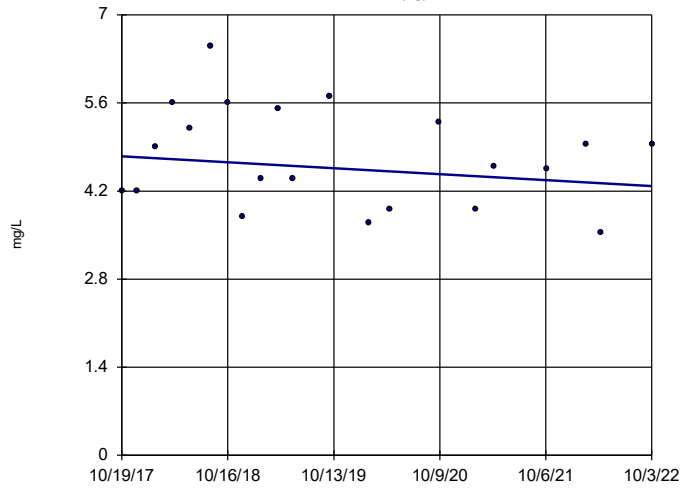
MW-1601 (bg)



Constituent: Chloride total Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradie Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1602 (bg)

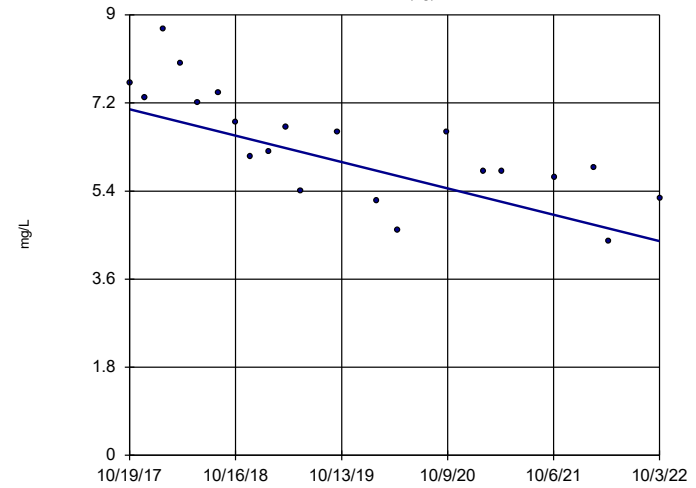


n = 21
 Slope = -0.09489
 units per year.
 Mann-Kendall
 statistic = -23
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: Chloride total Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradie
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1608 (bg)

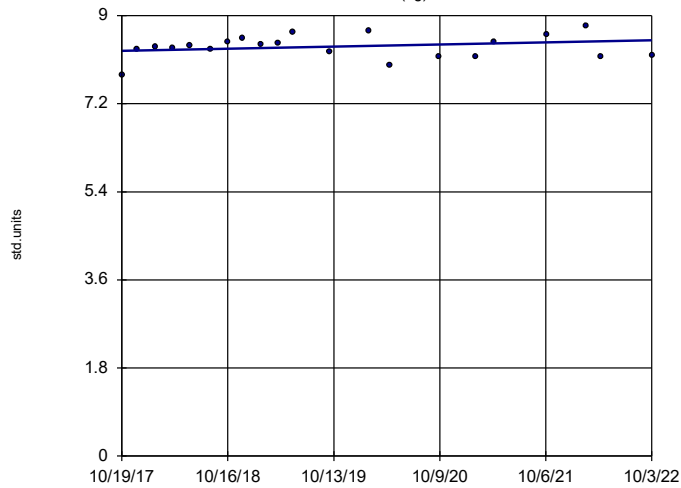


n = 21
 Slope = -0.5443
 units per year.
 Mann-Kendall
 statistic = -138
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: Chloride total Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradie
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1601 (bg)

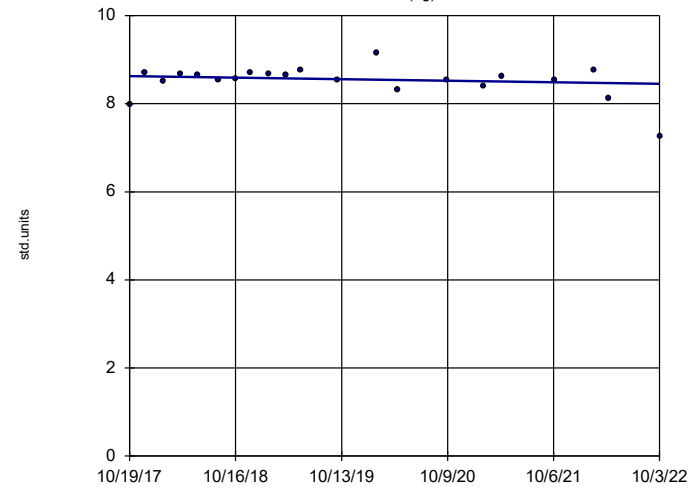


n = 21
 Slope = 0.04357
 units per year.
 Mann-Kendall
 statistic = 28
 critical = 87
 Trend not sig-
 nificant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: pH [field] Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradient Tr
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1602 (bg)

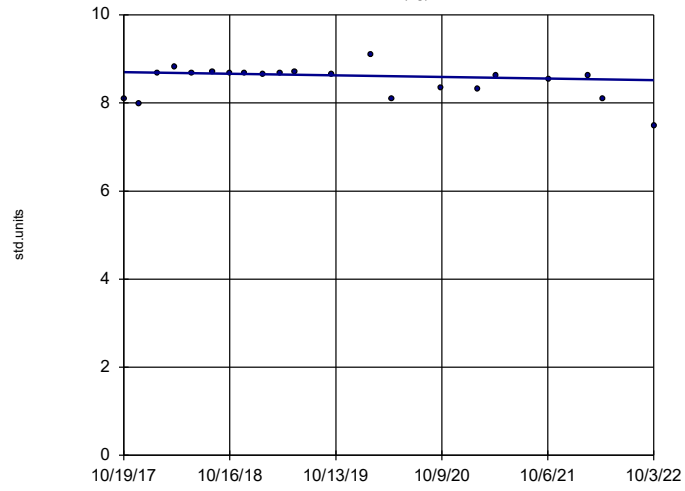


n = 21
 Slope = -0.03408
 units per year.
 Mann-Kendall
 statistic = -31
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: pH [field] Analysis Run 1/24/2023 12:52 PM View: Chattanooga Shale - Pond 1 Upgradient Tr
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1608 (bg)



Upgradient Trend Tests - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:53 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Chloride total (mg/L)	MW-1609 (bg)	-0.2404	-130	-87	Yes	21	0	n/a	n/a	0.01	NP

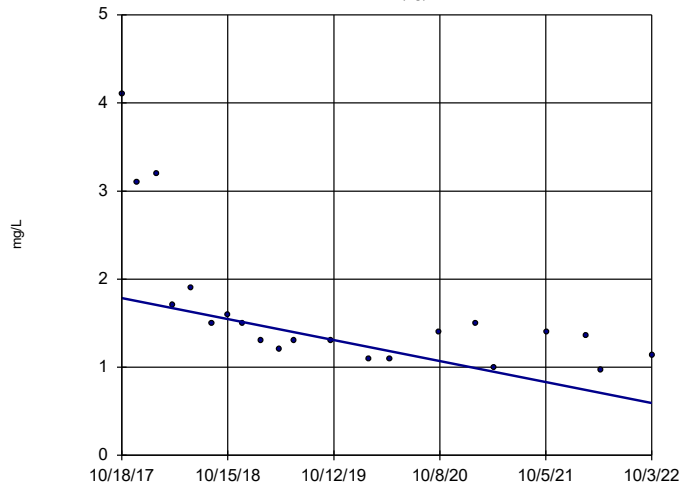
Upgradient Trend Tests - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 2:53 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Chloride total (mg/L)	MW-1609 (bg)	-0.2404	-130	-87	Yes	21	0	n/a	n/a	0.01	NP
Sulfate total (mg/L)	MW-1609 (bg)	-0.2669	-22	-87	No	21	0	n/a	n/a	0.01	NP

Sen's Slope Estimator

MW-1609 (bg)

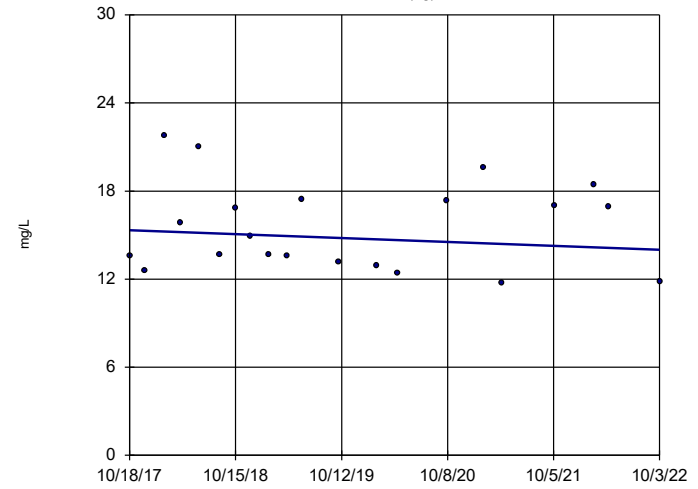


n = 21
 Slope = -0.2404
 units per year.
 Mann-Kendall
 statistic = -130
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: Chloride total Analysis Run 1/24/2023 2:52 PM View: Rome Limestone - Pond 1 Upgradient T
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1609 (bg)



n = 21
 Slope = -0.2669
 units per year.
 Mann-Kendall
 statistic = -22
 critical = -87
 Trend not sig-
 nificant at 99

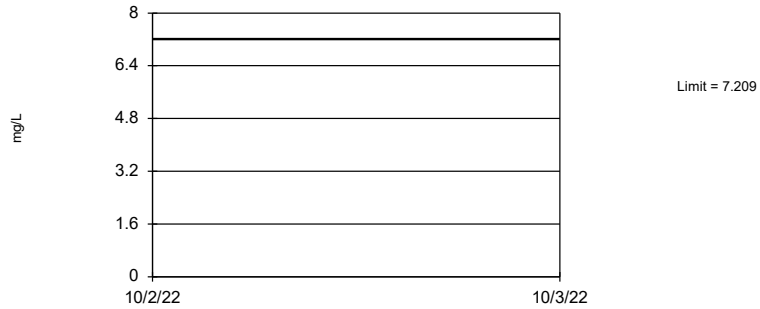
FIGURE G.

Interwell Prediction Limits - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 1:14 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg. N	Bg. Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium total (mg/L)	n/a	7.209	n/a	n/a	4 future	n/a	63	3.458	2.108	0	None	No	0.00188	Param Inter 1 of 2
Chloride total (mg/L)	n/a	45.8	n/a	n/a	4 future	n/a	63	n/a	n/a	0	n/a	n/a	0.0004837	NP Inter (normality) 1 of 2
pH [field] (std.units)	n/a	9.14	7.25	n/a	4 future	n/a	63	n/a	n/a	0	n/a	n/a	0.0009673	NP Inter (normality) 1 of 2

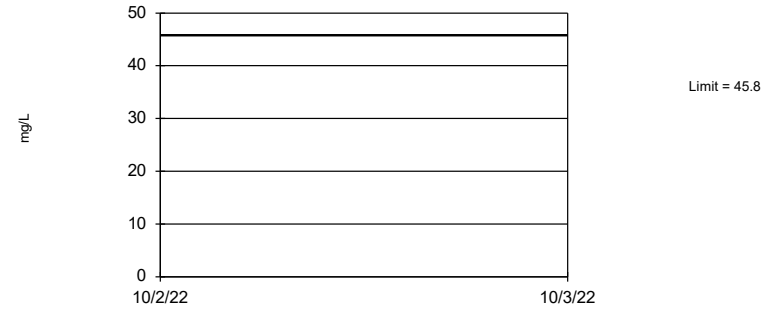
Prediction Limit
Interwell Parametric



Background Data Summary: Mean=3.458, Std. Dev.=2.108, n=63. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9503, critical = 0.947. Kappa = 1.779 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.00188. Assumes 4 future values.

Constituent: Calcium total Analysis Run 1/24/2023 1:12 PM View: Chattanooga Shale - Pond 1 Interwell Clinch River LF Client: AEP Data: Clinch River

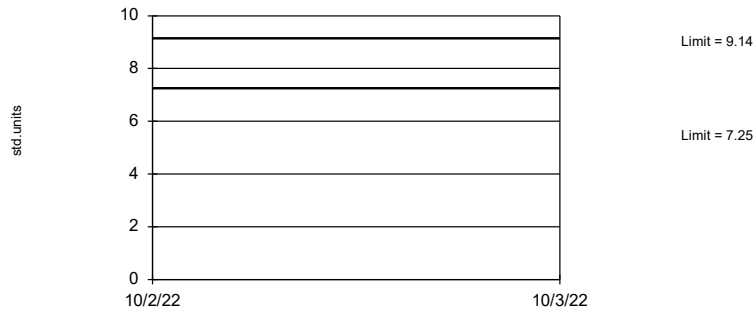
Prediction Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 63 background values. Annual per-constituent alpha = 0.003863. Individual comparison alpha = 0.0004837 (1 of 2). Assumes 4 future values.

Constituent: Chloride total Analysis Run 1/24/2023 1:12 PM View: Chattanooga Shale - Pond 1 Interwell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 63 background values. Annual per-constituent alpha = 0.007725. Individual comparison alpha = 0.0009673 (1 of 2). Assumes 4 future values.

Constituent: pH [field] Analysis Run 1/24/2023 1:12 PM View: Chattanooga Shale - Pond 1 Interwell Clinch River LF Client: AEP Data: Clinch River

Interwell Prediction Limits - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 3:24 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg.	N Bg	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Chloride total (mg/L)	n/a	4.1	n/a	n/a	2 future	n/a	21	n/a	n/a	n/a	0	n/a	n/a	0.003935	NP Inter (normality) 1 of 2
Sulfate total (mg/L)	n/a	20.76	n/a	n/a	2 future	n/a	21	15.53	3.002	0	None	No	0.003756	Param Inter 1 of 2	

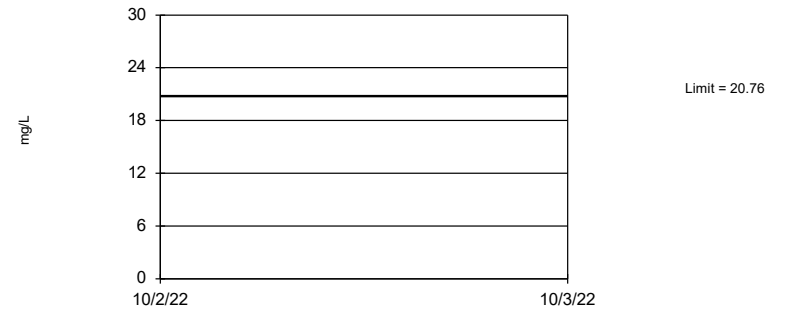
Prediction Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 21 background values. Annual per-constituent alpha = 0.01565. Individual comparison alpha = 0.003935 (1 of 2). Assumes 2 future values.

Constituent: Chloride total Analysis Run 1/24/2023 3:24 PM View: Rome Limestone - Pond 1 Interwell
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit Interwell Parametric



Background Data Summary: Mean=15.53, Std. Dev.=3.002, n=21. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9255, critical = 0.873. Kappa = 1.743 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.003756. Assumes 2 future values.

Constituent: Sulfate total Analysis Run 1/24/2023 3:24 PM View: Rome Limestone - Pond 1 Interwell
Clinch River LF Client: AEP Data: Clinch River

FIGURE H.

Tolerance Limits Summary Table - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/12/2023, 4:14 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	0.0003757	n/a	n/a	n/a	n/a 63	-9.538	0.8229	3.175	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	0.0258	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Barium total (mg/L)	0.306	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Beryllium total (mg/L)	0.000066	n/a	n/a	n/a	n/a 63	n/a	n/a	65.08	n/a	n/a	0.0395	NP Inter(NDs)
Cadmium total (mg/L)	0.00003	n/a	n/a	n/a	n/a 63	n/a	n/a	85.71	n/a	n/a	0.0395	NP Inter(NDs)
Chromium total (mg/L)	0.001118	n/a	n/a	n/a	n/a 63	-8.217	0.708	1.587	None	ln(x)	0.05	Inter
Cobalt total (mg/L)	0.0003833	n/a	n/a	n/a	n/a 63	0.04558	0.01349	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	2.621	n/a	n/a	n/a	n/a 63	0.8998	0.2387	0	None	x^(1/3)	0.05	Inter
Fluoride total (mg/L)	2.42	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Lead total (mg/L)	0.0004926	n/a	n/a	n/a	n/a 63	0.0452	0.01683	25.4	Kaplan-Meier	x^(1/3)	0.05	Inter
Lithium total (mg/L)	0.118	n/a	n/a	n/a	n/a 63	n/a	n/a	1.587	n/a	n/a	0.0395	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 63	n/a	n/a	88.89	n/a	n/a	0.0395	NP Inter(NDs)
Molybdenum total (mg/L)	0.0257	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Selenium total (mg/L)	0.0005	n/a	n/a	n/a	n/a 63	n/a	n/a	49.21	n/a	n/a	0.0395	NP Inter(normality)
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 63	n/a	n/a	77.78	n/a	n/a	0.0395	NP Inter(NDs)

Tolerance Limits Summary Table - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/13/2023, 4:32 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	0.0001053	n/a	n/a	n/a	n/a 21	0.005718	0.001917	9.524	None	sqrt(x)	0.05	Inter
Arsenic total (mg/L)	0.00097	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Barium total (mg/L)	0.5118	n/a	n/a	n/a	n/a 21	0.3951	0.04923	0	None	No	0.05	Inter
Beryllium total (mg/L)	0.00005	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Cadmium total (mg/L)	0.00004	n/a	n/a	n/a	n/a 21	n/a	n/a	19.05	n/a	n/a	0.3406	NP Inter(normality)
Chromium total (mg/L)	0.0003212	n/a	n/a	n/a	n/a 21	0.0001565	0.00006946	9.524	None	No	0.05	Inter
Cobalt total (mg/L)	0.00125	n/a	n/a	n/a	n/a 21	0.01377	0.009102	14.29	None	sqrt(x)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	4.999	n/a	n/a	n/a	n/a 21	1.407	0.3494	0	None	sqrt(x)	0.05	Inter
Fluoride total (mg/L)	0.337	n/a	n/a	n/a	n/a 21	0.2543	0.03487	0	None	No	0.05	Inter
Lead total (mg/L)	0.001186	n/a	n/a	n/a	n/a 21	0.01924	0.006408	0	None	sqrt(x)	0.05	Inter
Lithium total (mg/L)	0.01	n/a	n/a	n/a	n/a 21	n/a	n/a	28.57	n/a	n/a	0.3406	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Molybdenum total (mg/L)	0.00222	n/a	n/a	n/a	n/a 21	n/a	n/a	23.81	n/a	n/a	0.3406	NP Inter(normality)
Selenium total (mg/L)	0.0003912	n/a	n/a	n/a	n/a 21	0.008041	0.00495	28.57	Kaplan-Meier	sqrt(x)	0.05	Inter
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 21	n/a	n/a	76.19	n/a	n/a	0.3406	NP Inter(NDs)

Tolerance Limits Summary Table - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/13/2023, 4:11 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig. Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony total (mg/L)	0.0008018	n/a	n/a	n/a	n/a 21	-9.577	1.033	14.29	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	0.0395	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Barium total (mg/L)	0.2823	n/a	n/a	n/a	n/a 21	0.3274	0.08602	0	None	sqrt(x)	0.05	Inter
Beryllium total (mg/L)	0.00005	n/a	n/a	n/a	n/a 21	n/a	n/a	76.19	n/a	n/a	0.3406	NP Inter(NDs)
Cadmium total (mg/L)	0.00002	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Chromium total (mg/L)	0.0009231	n/a	n/a	n/a	n/a 21	0.0003836	0.0002275	0	None	No	0.05	Inter
Cobalt total (mg/L)	0.0001361	n/a	n/a	n/a	n/a 20	0.0000498	0.000036	0	None	No	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	1.698	n/a	n/a	n/a	n/a 21	0.648	0.443	0	None	No	0.05	Inter
Fluoride total (mg/L)	1.375	n/a	n/a	n/a	n/a 21	0.9571	0.1762	0	None	No	0.05	Inter
Lead total (mg/L)	0.0002	n/a	n/a	n/a	n/a 20	n/a	n/a	40	n/a	n/a	0.3585	NP Inter(normality)
Lithium total (mg/L)	0.161	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Molybdenum total (mg/L)	0.005519	n/a	n/a	n/a	n/a 20	-6.138	0.3916	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	0.0005	n/a	n/a	n/a	n/a 21	n/a	n/a	23.81	n/a	n/a	0.3406	NP Inter(normality)
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 21	n/a	n/a	85.71	n/a	n/a	0.3406	NP Inter(NDs)

FIGURE I.

CLINCH RIVER GWPS - CHATTANOOGA SHALE				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00038	0.006
Arsenic, Total (mg/L)	0.01		0.026	0.026
Barium, Total (mg/L)	2		0.31	2
Beryllium, Total (mg/L)	0.004		0.000066	0.004
Cadmium, Total (mg/L)	0.005		0.00003	0.005
Chromium, Total (mg/L)	0.1		0.00112	0.1
Cobalt, Total (mg/L)		0.006	0.00038	0.006
Combined Radium, Total (pCi/L)	5		2.62	5
Fluoride, Total (mg/L)	4		2.42	4
Lead, Total (mg/L)		0.015	0.00049	0.015
Lithium, Total (mg/L)		0.04	0.118	0.118
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.026	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**Grey cell indicates background is higher than MCL or CCR Rule*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - ROME LIMESTONE				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00011	0.006
Arsenic, Total (mg/L)	0.01		0.00097	0.01
Barium, Total (mg/L)	2		0.51	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00004	0.005
Chromium, Total (mg/L)	0.1		0.00032	0.1
Cobalt, Total (mg/L)		0.006	0.0013	0.006
Combined Radium, Total (pCi/L)	5		5	5
Fluoride, Total (mg/L)	4		0.34	4
Lead, Total (mg/L)		0.015	0.0012	0.015
Lithium, Total (mg/L)		0.04	0.01	0.04
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0022	0.1
Selenium, Total (mg/L)	0.05		0.00039	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - DUMPS FAULT				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.0008	0.006
Arsenic, Total (mg/L)	0.01		0.04	0.04
Barium, Total (mg/L)	2		0.28	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00002	0.005
Chromium, Total (mg/L)	0.1		0.00092	0.1
Cobalt, Total (mg/L)		0.006	0.00014	0.006
Combined Radium, Total (pCi/L)	5		1.7	5
Fluoride, Total (mg/L)	4		1.38	4
Lead, Total (mg/L)		0.015	0.0002	0.015
Lithium, Total (mg/L)		0.04	0.161	0.161
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0055	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**Grey cell indicates background is higher than MCL or CCR Rule*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

FIGURE J.

Confidence Interval - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/12/2023, 4:22 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium total (mg/L)	MW-1603	2.792	2.174	2	Yes	21	2.483	0.5603	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.262	3.102	2	Yes	21	3.182	0.1447	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.353	2.049	2	Yes	20	2.201	0.2685	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2021	0.1885	0.118	Yes	21	0.1953	0.01232	0	None	No	0.01	Param.

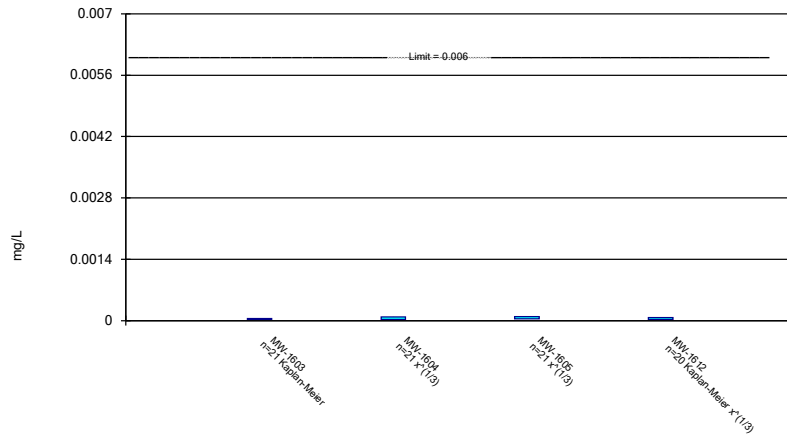
Confidence Interval - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/12/2023, 4:22 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1603	0.000477	0.00002309	0.006	No	21	0.0000481	0.00002542	19.05	Kaplan-Meier	No	0.01	Param.
Antimony total (mg/L)	MW-1604	0.00008769	0.00002882	0.006	No	21	0.0000719	0.00009003	14.29	None	x^(1/3)	0.01	Param.
Antimony total (mg/L)	MW-1605	0.00009333	0.00004108	0.006	No	21	0.00007571	0.00006493	9.524	None	x^(1/3)	0.01	Param.
Antimony total (mg/L)	MW-1612	0.00006831	0.00002333	0.006	No	20	0.000073	0.00006554	20	Kaplan-Meier	x^(1/3)	0.01	Param.
Arsenic total (mg/L)	MW-1603	0.002782	0.002102	0.026	No	21	0.002442	0.0006161	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1604	0.002907	0.001821	0.026	No	21	0.002364	0.0009847	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1605	0.004189	0.002304	0.026	No	21	0.003246	0.001708	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1612	0.00131	0.0005222	0.026	No	20	0.001047	0.0009375	0	None	x^(1/3)	0.01	Param.
Barium total (mg/L)	MW-1603	2.792	2.174	2	Yes	21	2.483	0.5603	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.262	3.102	2	Yes	21	3.182	0.1447	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1605	1.899	1.358	2	No	21	1.628	0.4904	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.353	2.049	2	Yes	20	2.201	0.2685	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1603	0.00005	0.00001	0.004	No	21	0.00004214	0.00001661	80.95	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1604	0.00005	0.000007	0.004	No	21	0.00004581	0.00001324	90.48	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1605	0.00005	0.00001	0.004	No	21	0.00004376	0.00001569	85.71	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1612	0.00005	0.000045	0.004	No	20	0.0000433	0.00001571	80	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1605	0.00002	0.00001	0.005	No	21	0.00001952	0.000002182	90.48	None	No	0.01	NP (NDs)
Chromium total (mg/L)	MW-1603	0.0002512	0.0001589	0.1	No	21	0.0002106	0.00009108	0	None	sqrt(x)	0.01	Param.
Chromium total (mg/L)	MW-1604	0.000276	0.0001204	0.1	No	21	0.0002569	0.0003417	0	None	ln(x)	0.01	Param.
Chromium total (mg/L)	MW-1605	0.0002718	0.0001723	0.1	No	21	0.000222	0.00009022	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1612	0.0002454	0.0001537	0.1	No	20	0.0002048	0.00008624	0	None	sqrt(x)	0.01	Param.
Cobalt total (mg/L)	MW-1603	0.0005262	0.0002821	0.006	No	21	0.0004041	0.0002213	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1604	0.0006698	0.0003814	0.006	No	21	0.0005256	0.0002614	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1605	0.000321	0.00004	0.006	No	21	0.0001912	0.00014	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1612	0.0002124	0.0001257	0.006	No	20	0.0001746	0.00008179	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1603	1.63	0.8663	5	No	21	1.248	0.6919	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1604	1.537	0.9902	5	No	21	1.264	0.496	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1605	2.122	0.868	5	No	21	1.642	1.363	0	None	No	0.01	NP (normality)
Combined Radium 226 and 228 (pCi/L)	MW-1612	2.258	1.377	5	No	20	1.817	0.7759	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1603	0.1382	0.1106	4	No	21	0.1252	0.0262	0	None	sqrt(x)	0.01	Param.
Fluoride total (mg/L)	MW-1604	0.2874	0.2373	4	No	21	0.2624	0.04538	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1605	0.3705	0.3324	4	No	21	0.3514	0.03454	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1612	0.1856	0.1464	4	No	20	0.166	0.03455	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1603	0.0002	0.000021	0.015	No	21	0.0001479	0.0000846	71.43	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1604	0.0002	0.000047	0.015	No	21	0.0001445	0.00008149	66.67	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1605	0.0002	0.00005	0.015	No	21	0.000128	0.0000783	52.38	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1612	0.0002	0.00007	0.015	No	20	0.0001603	0.00008309	65	None	No	0.01	NP (NDs)
Lithium total (mg/L)	MW-1603	0.07944	0.05923	0.118	No	21	0.06934	0.01832	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1604	0.08262	0.07461	0.118	No	21	0.07861	0.007261	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2021	0.1885	0.118	Yes	21	0.1953	0.01232	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1612	0.1295	0.1098	0.118	No	20	0.1183	0.02096	5	None	x^2	0.01	Param.
Mercury total (mg/L)	MW-1603	0.001	0.00006	0.002	No	21	0.0009552	0.0002051	95.24	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1604	0.001	0.00006	0.002	No	21	0.0009552	0.0002051	95.24	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1612	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1603	0.00151	0.0004	0.1	No	21	0.001053	0.001045	0	None	No	0.01	NP (normality)
Molybdenum total (mg/L)	MW-1604	0.0006551	0.0002688	0.1	No	21	0.0008967	0.0007042	19.05	Kaplan-Meier	x^(1/3)	0.01	Param.
Molybdenum total (mg/L)	MW-1605	0.003366	0.001074	0.1	No	21	0.00256	0.002439	0	None	sqrt(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1612	0.00121	0.0004323	0.1	No	20	0.0009165	0.0008346	5	None	sqrt(x)	0.01	Param.
Selenium total (mg/L)	MW-1603	0.00011	0.00007	0.05	No	21	0.0001595	0.0001703	19.05	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1604	0.0005	0.00005	0.05	No	21	0.0002429	0.0002284	42.86	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1605	0.0005	0.00005	0.05	No	21	0.00031	0.000225	57.14	None	No	0.01	NP (NDs)
Selenium total (mg/L)	MW-1612	0.0005	0.00004	0.05	No	20	0.0002955	0.0002324	55	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1603	0.0002	0.00002	0.002	No	21	0.0001552	0.00008207	76.19	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1604	0.0002	0.00002	0.002	No	21	0.0001643	0.00007547	80.95	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1605	0.0002	0.00002	0.002	No	21	0.0001648	0.00007447	80.95	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1612	0.0002	0.00003	0.002	No	20	0.000163	0.00007603	80	None	No	0.01	NP (NDs)

Parametric Confidence Interval

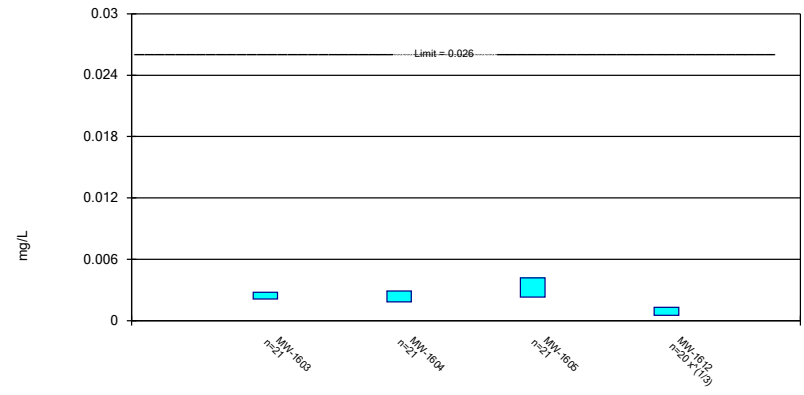
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Constituent: Antimony total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

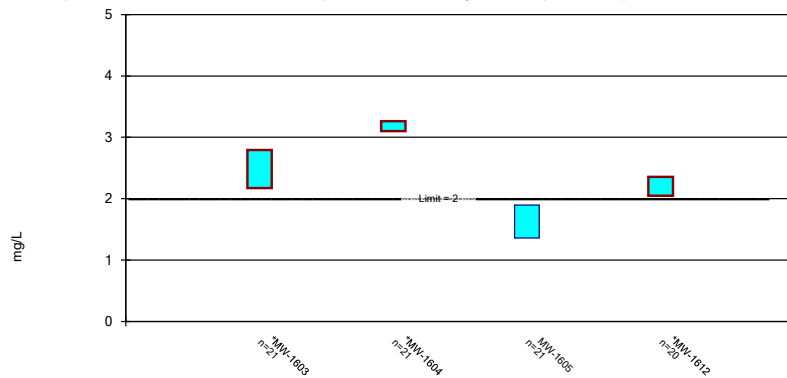
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

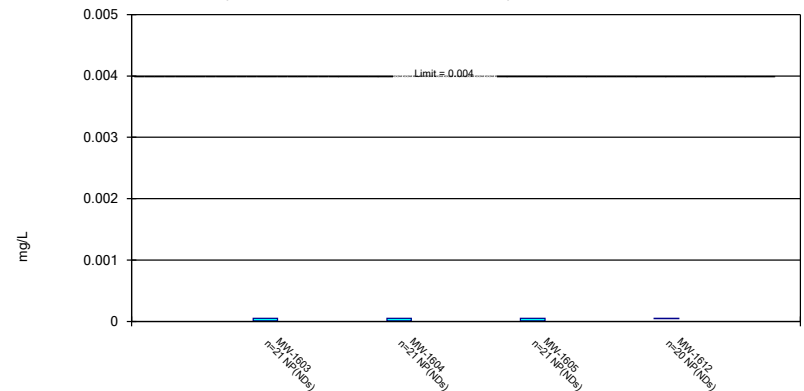
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Constituent: Barium total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

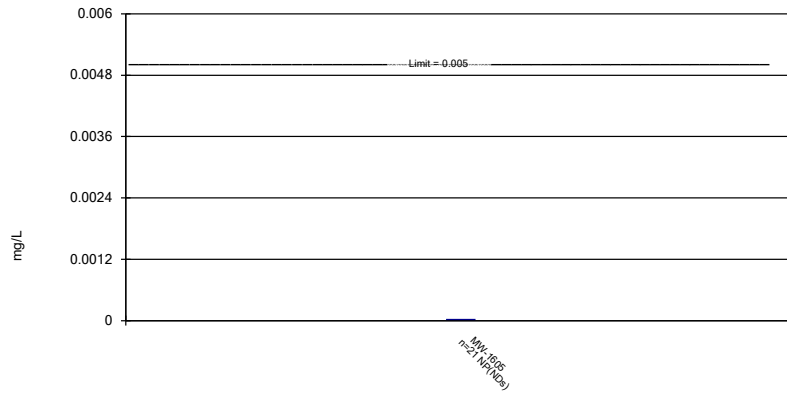
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

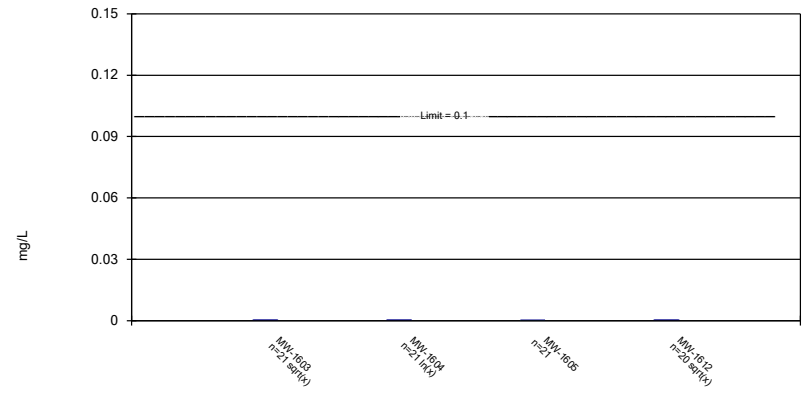
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

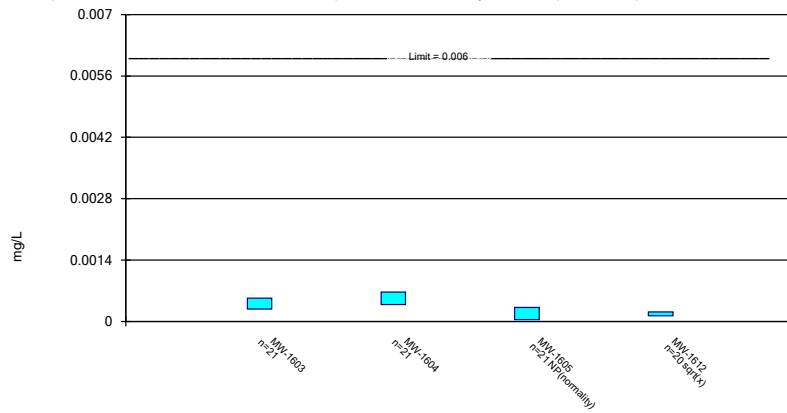
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River LF Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

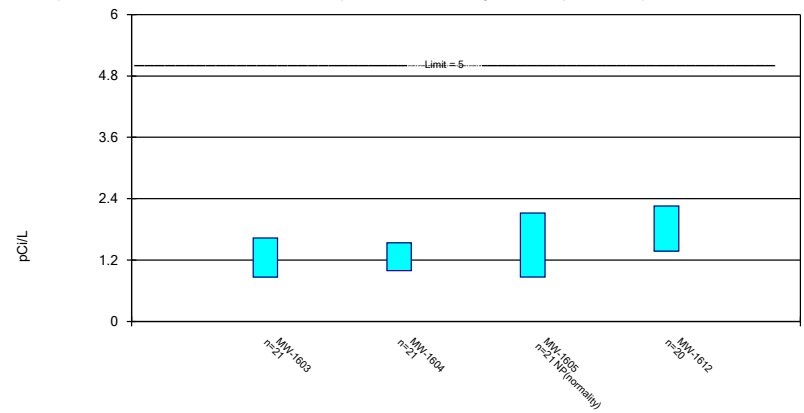
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River LF Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

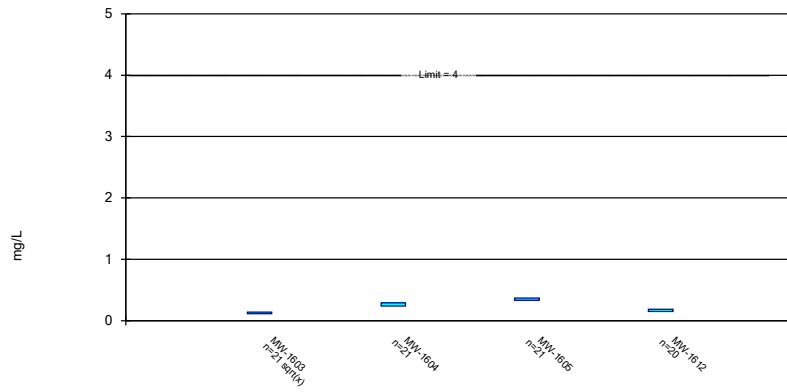
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

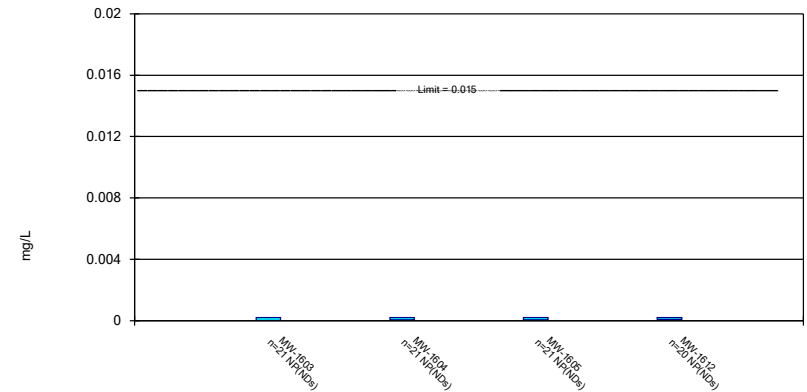
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

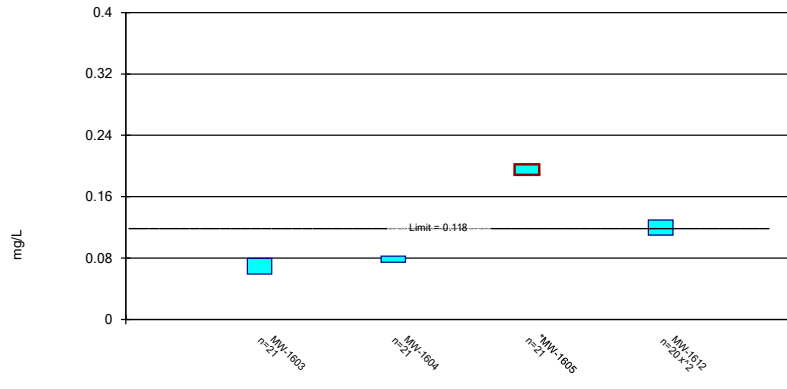
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence In
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

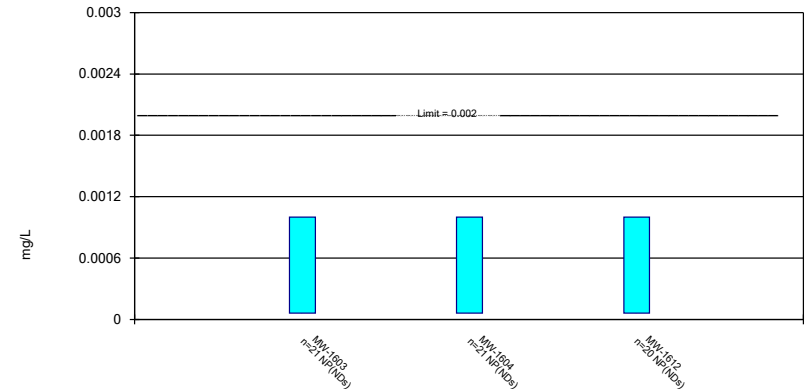
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

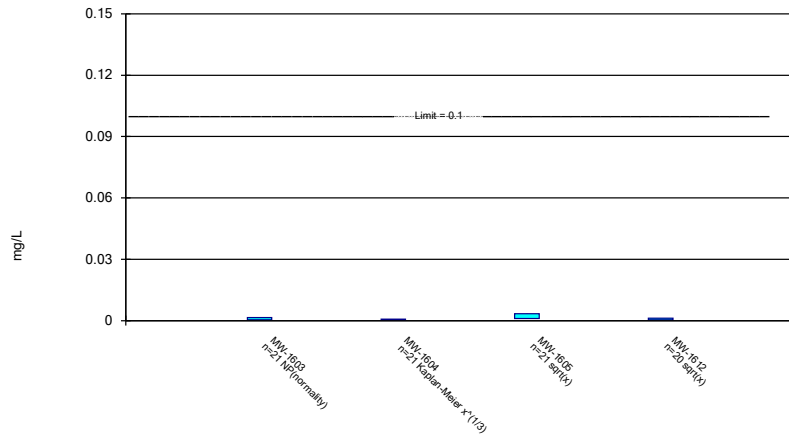
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidence
Clinch River LF Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

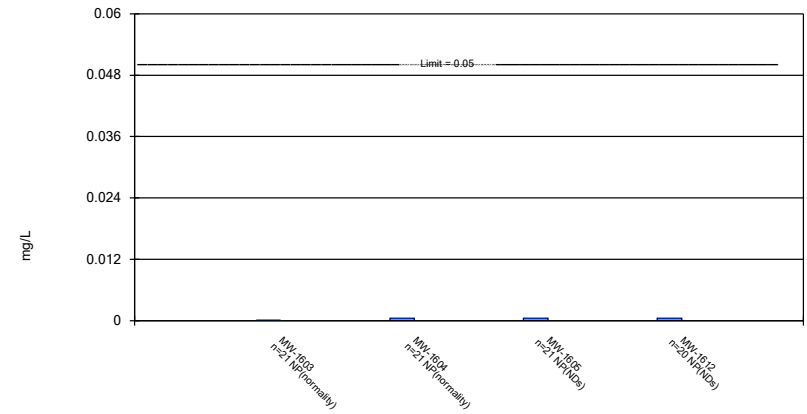
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Conf
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

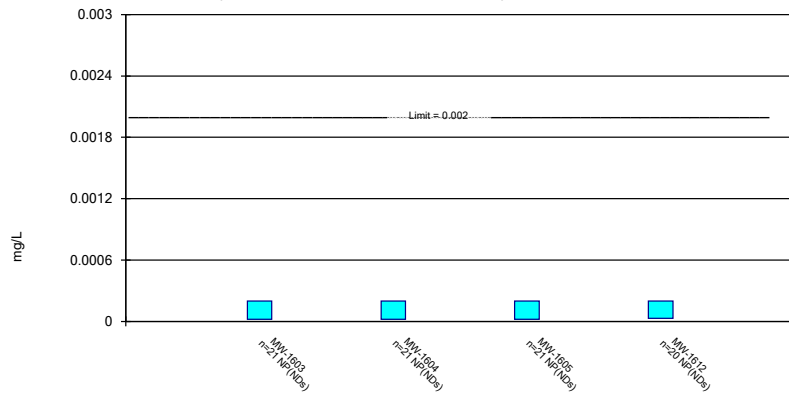
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confiden
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium total Analysis Run 1/12/2023 4:19 PM View: Chattanooga Shale - Pond 1 Confidenc
Clinch River LF Client: AEP Data: Clinch River

Confidence Interval - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/13/2023, 4:42 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt total (mg/L)	MW-1607	0.01062	0.008359	0.006	Yes	21	0.00949	0.00205	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.08654	0.05978	0.04	Yes	21	0.07316	0.02426	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.129	0.1189	0.04	Yes	21	0.124	0.009091	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1523	0.1308	0.1	Yes	21	0.1416	0.01943	0	None	No	0.01	Param.

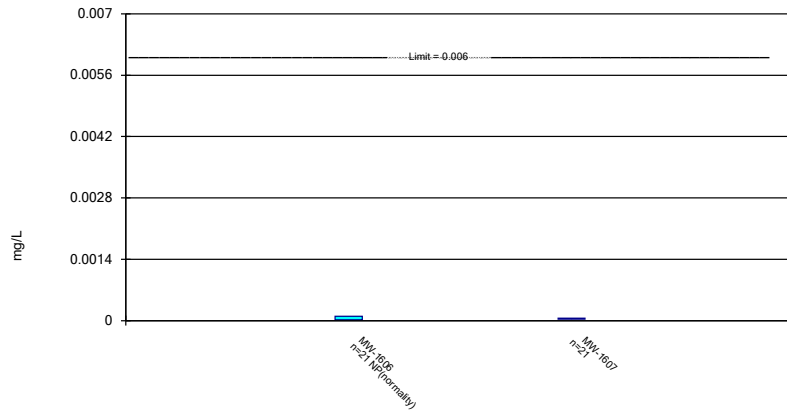
Confidence Interval - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/13/2023, 4:42 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1606	0.0001	0.00002	0.006	No	21	0.00005905	0.00003687	42.86	None	No	0.01	NP (normality)
Antimony total (mg/L)	MW-1607	0.00005381	0.00003095	0.006	No	21	0.00004238	0.00002071	4.762	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1606	0.00837	0.00689	0.01	No	21	0.008074	0.002399	0	None	No	0.01	NP (normality)
Arsenic total (mg/L)	MW-1607	0.0015	0.00098	0.01	No	21	0.001522	0.001133	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1606	0.1178	0.1074	2	No	21	0.1126	0.009405	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1607	0.0747	0.0679	2	No	21	0.0747	0.01636	0	None	No	0.01	NP (normality)
Beryllium total (mg/L)	MW-1606	0.00005	0.000007	0.004	No	21	0.00003219	0.00002125	57.14	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1607	0.00005	0.000005	0.004	No	21	0.00004786	0.00000982	95.24	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1606	0.00002	0.000009	0.005	No	21	0.00001438	0.000008576	38.1	None	No	0.01	NP (normality)
Cadmium total (mg/L)	MW-1607	0.0001584	0.00009805	0.005	No	21	0.0001282	0.00005472	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1606	0.0002705	0.0001727	0.1	No	21	0.0002357	0.0001142	0	None	ln(x)	0.01	Param.
Chromium total (mg/L)	MW-1607	0.000216	0.0001	0.1	No	21	0.0002092	0.0001588	9.524	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1606	0.005396	0.004277	0.006	No	21	0.004836	0.001014	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1607	0.01062	0.008359	0.006	Yes	21	0.00949	0.00205	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1606	2.345	1.325	5	No	21	1.948	1.173	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1607	1.343	0.7433	5	No	21	1.043	0.5438	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1606	0.2243	0.1833	4	No	21	0.2038	0.03721	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1607	0.2374	0.2102	4	No	21	0.2238	0.02459	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1606	0.0006344	0.0003995	0.015	No	21	0.000517	0.0002128	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1607	0.0005806	0.0004047	0.015	No	21	0.0004926	0.0001594	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.08654	0.05978	0.04	Yes	21	0.07316	0.02426	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.129	0.1189	0.04	Yes	21	0.124	0.009091	0	None	No	0.01	Param.
Mercury total (mg/L)	MW-1606	0.001	0.00006	0.002	No	21	0.0009552	0.0002051	95.24	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1607	0.001	0.00008	0.002	No	21	0.0009562	0.0002008	95.24	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1606	0.07424	0.05449	0.1	No	21	0.06437	0.0179	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1523	0.1308	0.1	Yes	21	0.1416	0.01943	0	None	No	0.01	Param.
Selenium total (mg/L)	MW-1606	0.0002	0.00007	0.05	No	21	0.0001686	0.000168	19.05	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1607	0.000249	0.0001191	0.05	No	21	0.0001967	0.0001434	9.524	None	sqrt(x)	0.01	Param.
Thallium total (mg/L)	MW-1606	0.0002	0.00005	0.002	No	21	0.0001505	0.00007277	66.67	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1607	0.0002	0.00005	0.002	No	21	0.0001467	0.00007914	66.67	None	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

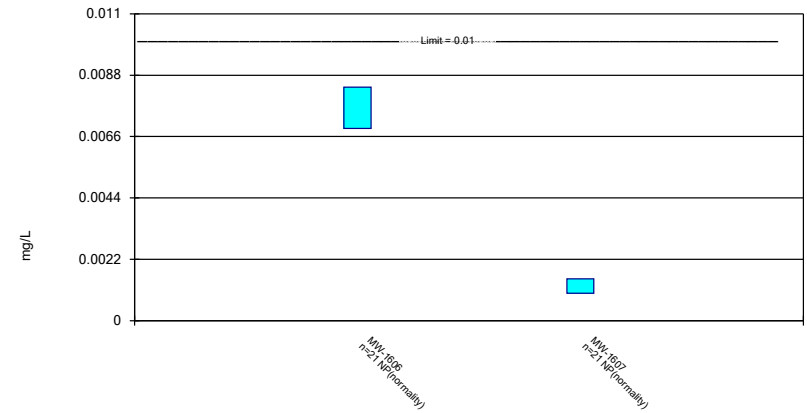
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

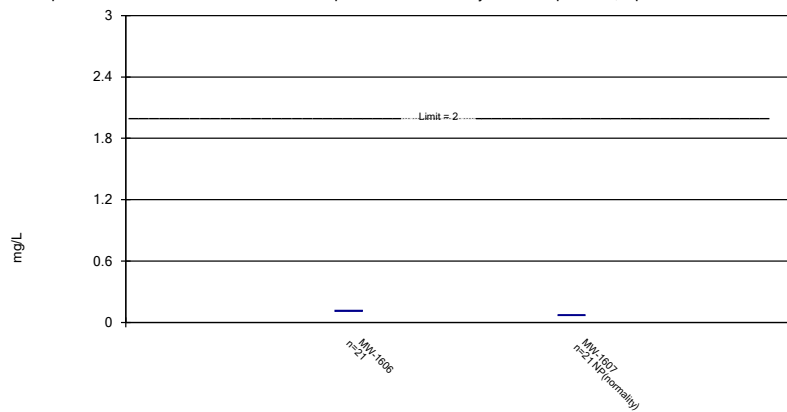
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

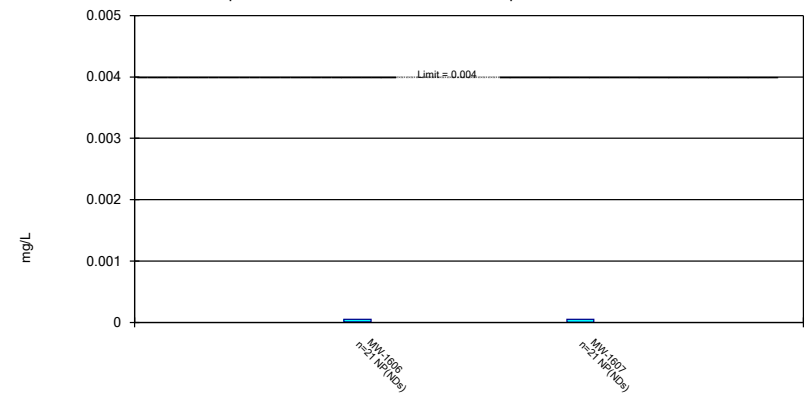
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

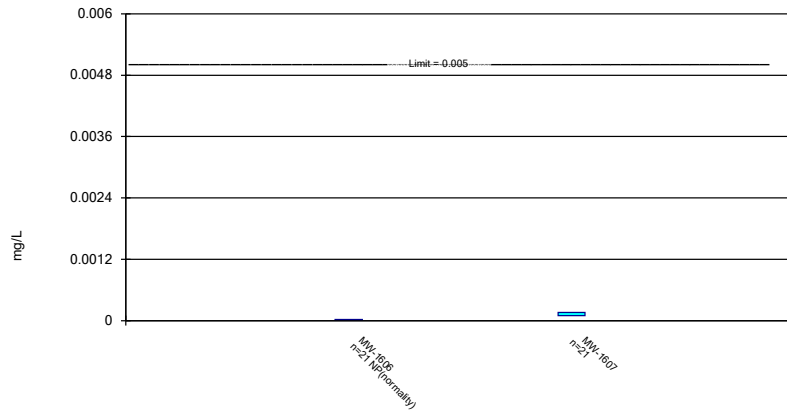
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

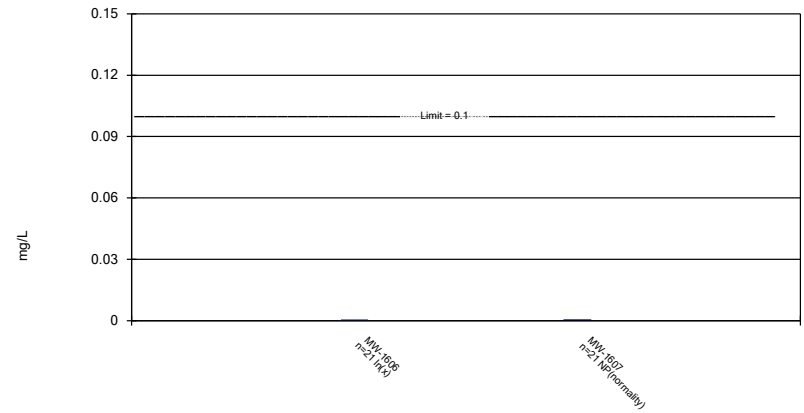
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence
Clinch River LF Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

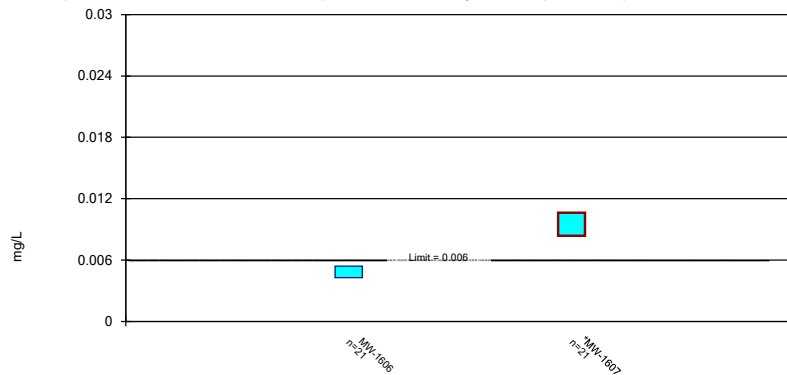
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

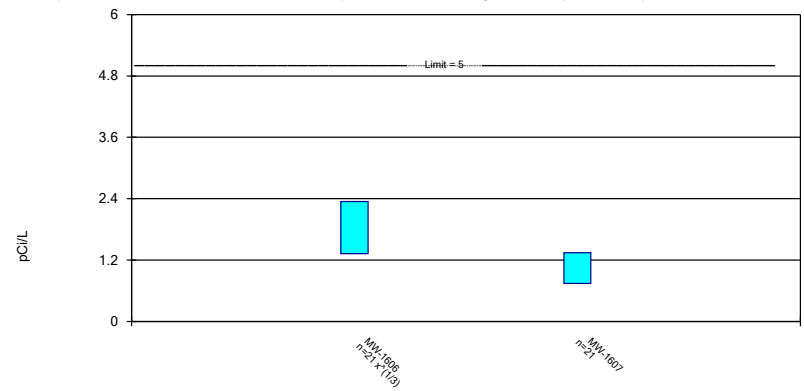
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence Int
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

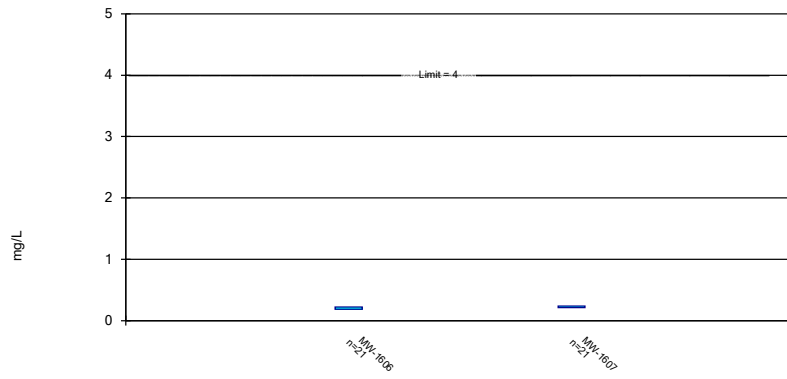
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - P
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

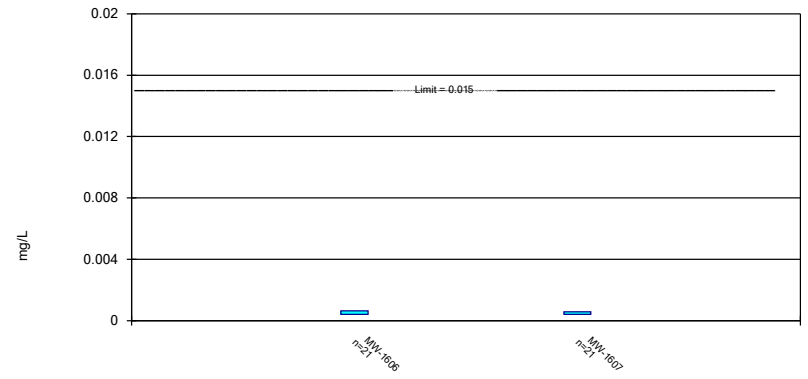
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence I
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

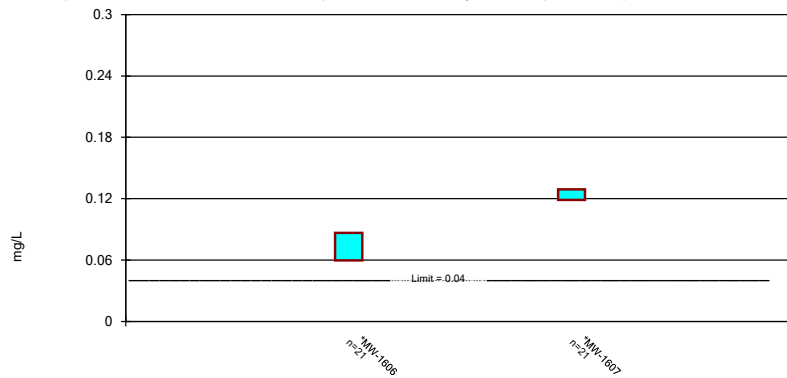
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence Inter
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

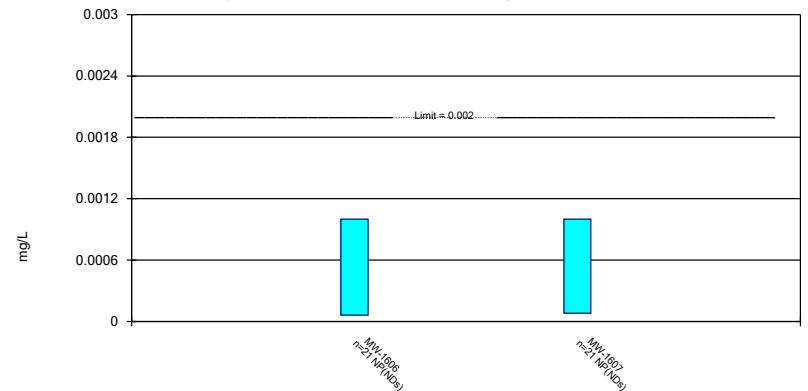
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence In
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

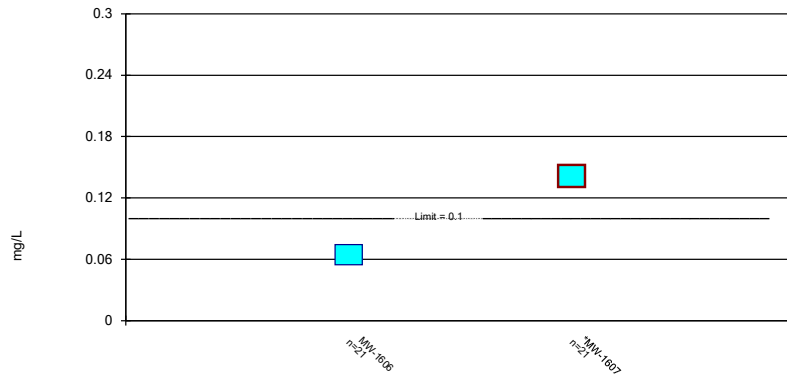
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence I
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

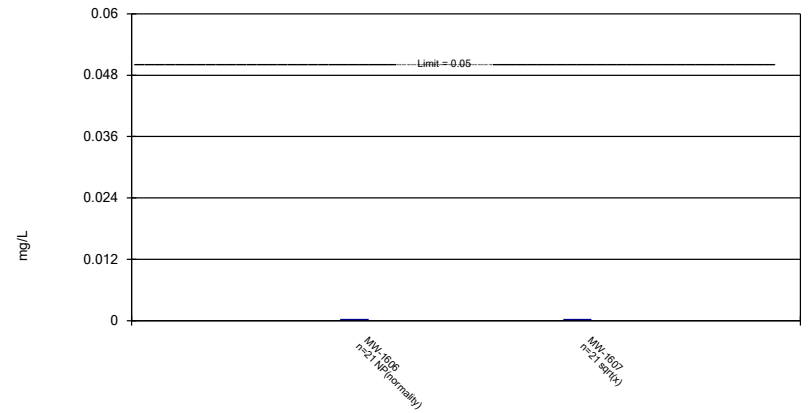
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

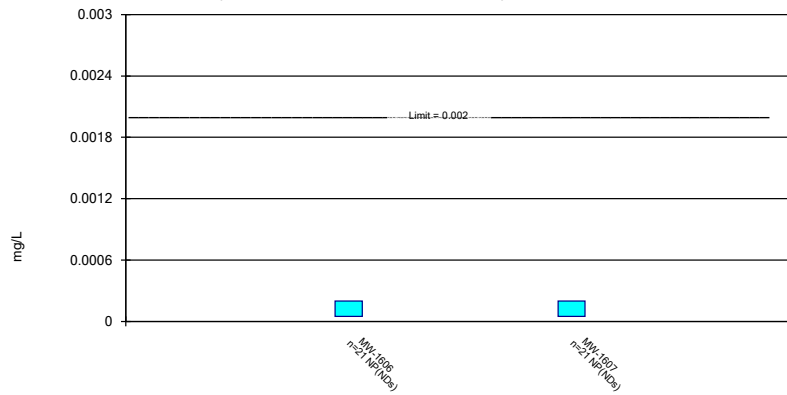
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium total Analysis Run 1/13/2023 4:39 PM View: Rome Limestone - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

Confidence Interval - Dumps Fault - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/13/2023, 4:16 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt total (mg/L)	MW-1610	0.008951	0.006331	0.006	Yes	21	0.007641	0.002375	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1610	0.2066	0.1641	0.161	Yes	21	0.1883	0.0449	0	None	ln(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1610	0.1758	0.1222	0.1	Yes	21	0.1526	0.05434	0	None	x^(1/3)	0.01	Param.

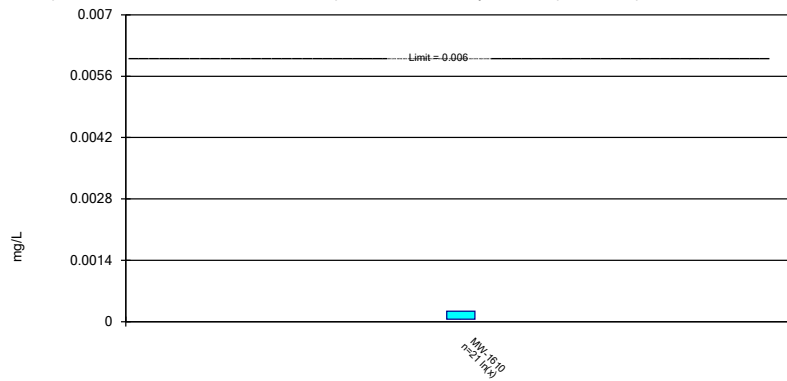
Confidence Interval - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/13/2023, 4:16 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1610	0.0002355	0.00005619	0.006	No	21	0.0002719	0.0004255	4.762	None	In(x)	0.01	Param.
Arsenic total (mg/L)	MW-1610	0.00167	0.00118	0.04	No	21	0.001637	0.001024	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1610	0.2689	0.2162	2	No	21	0.2426	0.0478	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1610	0.00005	0.000007	0.004	No	21	0.00004138	0.00001822	80.95	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1610	0.00003	0.00001	0.005	No	21	0.00001914	0.00001399	33.33	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1610	0.000262	0.000174	0.1	No	21	0.0002485	0.0001465	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1610	0.008951	0.006331	0.006	Yes	21	0.007641	0.002375	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1610	1.352	0.7824	5	No	21	1.067	0.5161	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1610	0.22	0.18	4	No	21	0.2086	0.04066	0	None	No	0.01	NP (normality)
Lead total (mg/L)	MW-1610	0.008401	0.003299	0.015	No	21	0.00585	0.004624	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1610	0.2066	0.1641	0.161	Yes	21	0.1883	0.0449	0	None	In(x)	0.01	Param.
Mercury total (mg/L)	MW-1610	0.001	0.00006	0.002	No	21	0.0009552	0.0002051	95.24	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1610	0.1758	0.1222	0.1	Yes	21	0.1526	0.05434	0	None	x^(1/3)	0.01	Param.
Selenium total (mg/L)	MW-1610	0.0003491	0.0002042	0.05	No	21	0.0002767	0.0001313	4.762	None	No	0.01	Param.
Thallium total (mg/L)	MW-1610	0.0002	0.00003	0.002	No	21	0.0001486	0.00008338	71.43	None	No	0.01	NP (NDs)

Parametric Confidence Interval

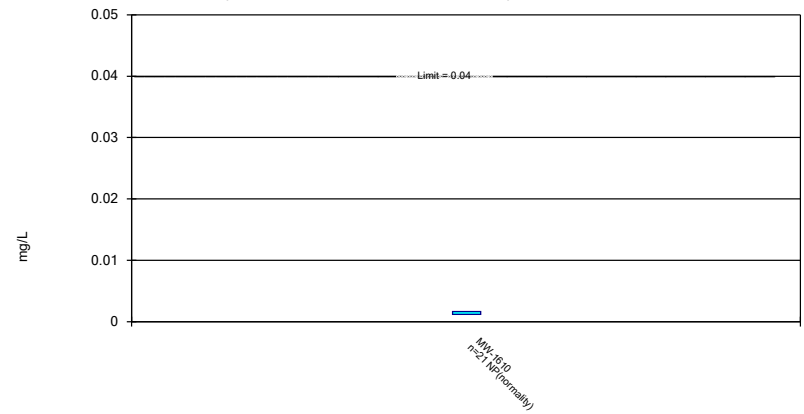
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Inte
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

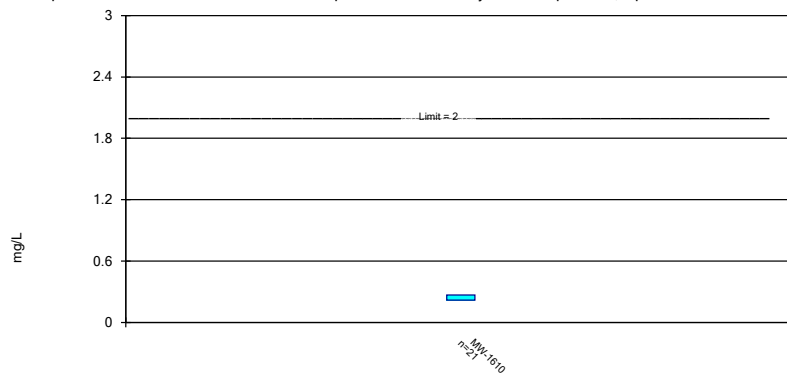
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

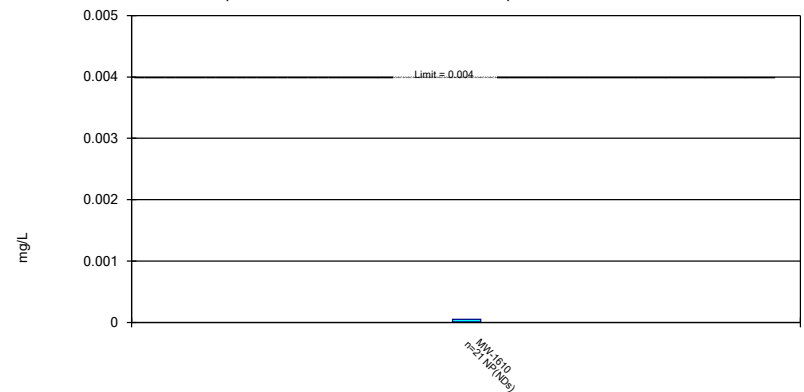
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

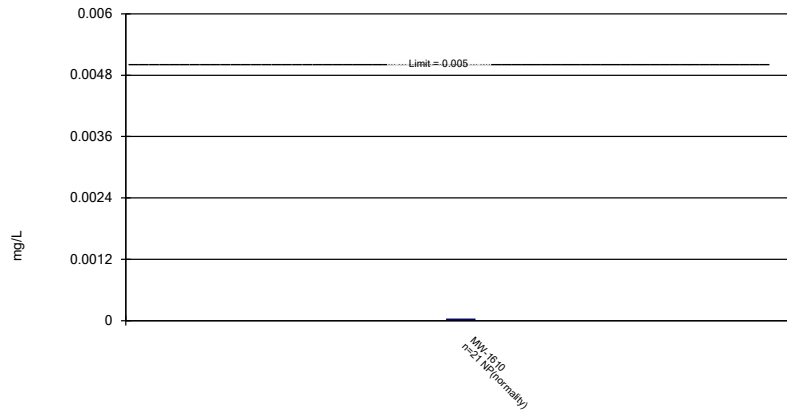
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Inte
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

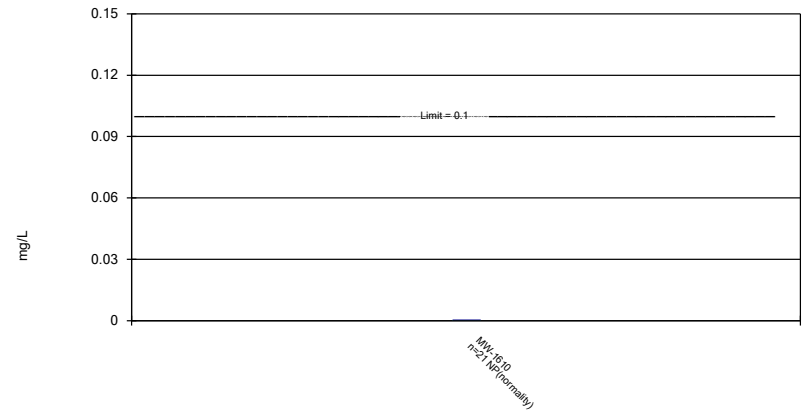
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Int
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

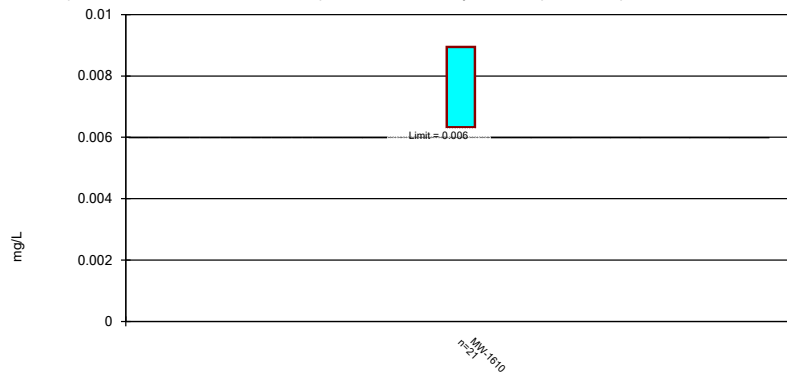
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Chromium total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Int
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

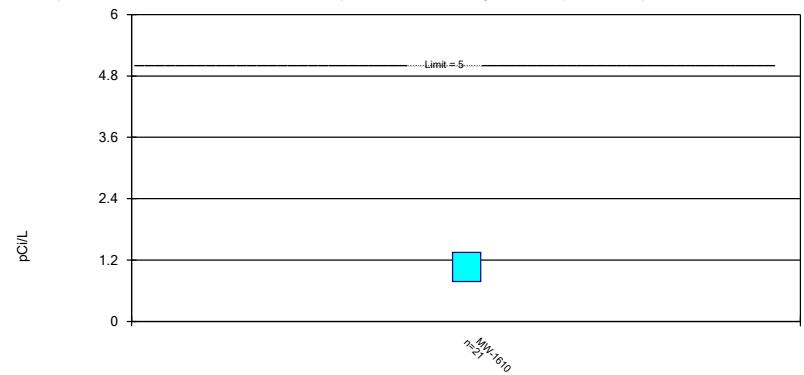
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Interva
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

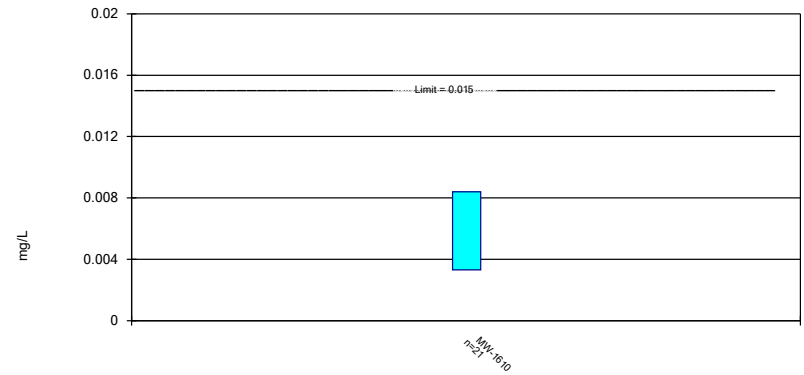
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

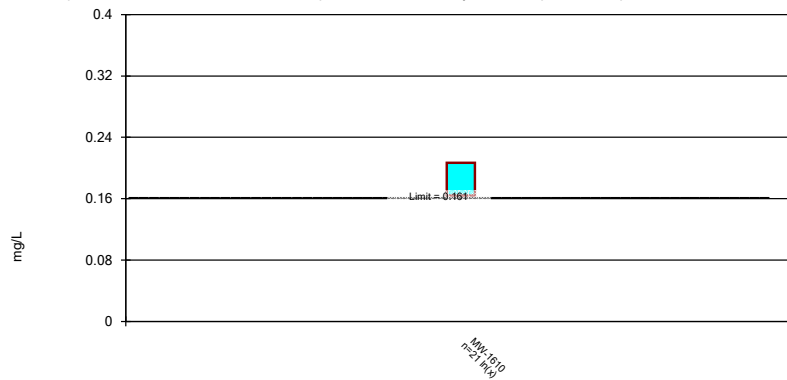
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Intervals
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

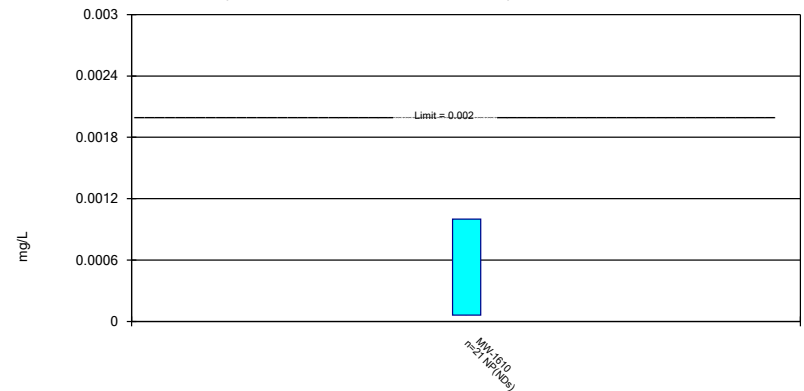
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

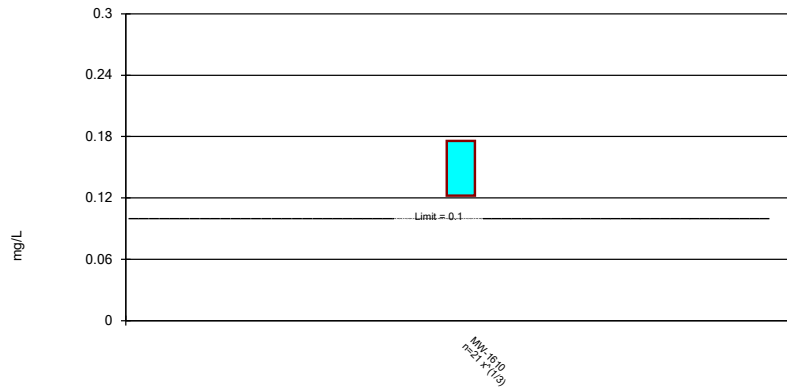
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

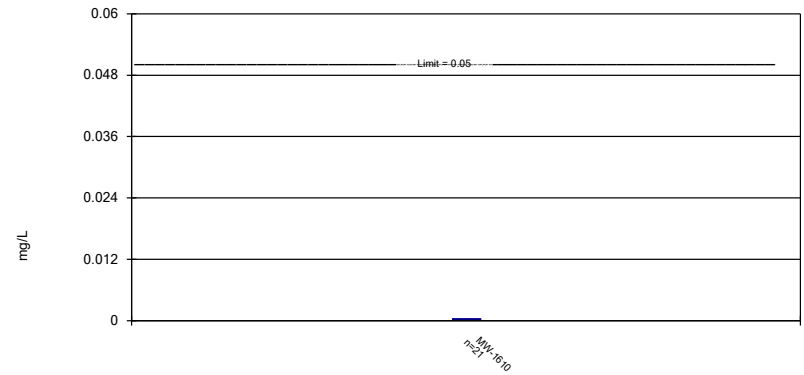
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence I
Clinch River LF Client: AEP Data: Clinch River

Parametric Confidence Interval

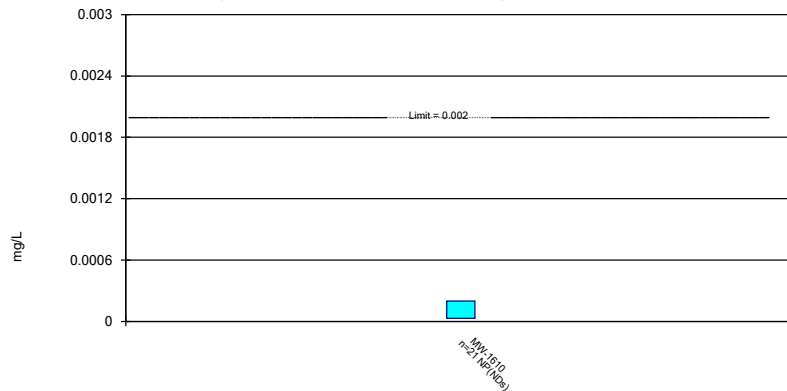
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Inte
Clinch River LF Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium total Analysis Run 1/13/2023 4:14 PM View: Dumps Fault - Pond 1 Confidence Inter
Clinch River LF Client: AEP Data: Clinch River

FIGURE K.

Appendix IV Trend Tests - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 4:40 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Barium total (mg/L)	MW-1601 (bg)	-0.02839	-134	-87	Yes	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1602 (bg)	-0.0026	-119	-87	Yes	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1603	0.2438	112	87	Yes	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1608 (bg)	-0.003738	-166	-87	Yes	21	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1608 (bg)	-0.00116	-93	-87	Yes	21	4.762	n/a	n/a	0.01	NP

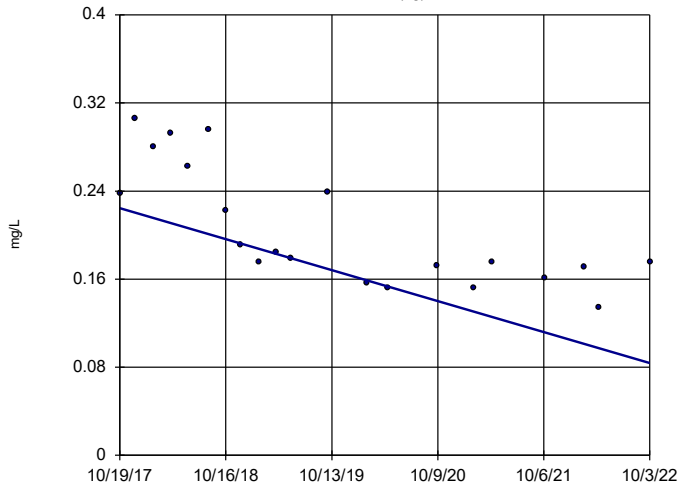
Appendix IV Trend Tests - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 4:40 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Barium total (mg/L)	MW-1601 (bg)	-0.02839	-134	-87	Yes	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1602 (bg)	-0.0026	-119	-87	Yes	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1603	0.2438	112	87	Yes	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1604	-0.006553	-13	-87	No	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1608 (bg)	-0.003738	-166	-87	Yes	21	0	n/a	n/a	0.01	NP
Barium total (mg/L)	MW-1612	0.09986	56	81	No	20	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1601 (bg)	-0.0007367	-39	-87	No	21	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1602 (bg)	-0.001463	-62	-87	No	21	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1605	-0.0008625	-15	-87	No	21	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1608 (bg)	-0.00116	-93	-87	Yes	21	4.762	n/a	n/a	0.01	NP

Sen's Slope Estimator

MW-1601 (bg)

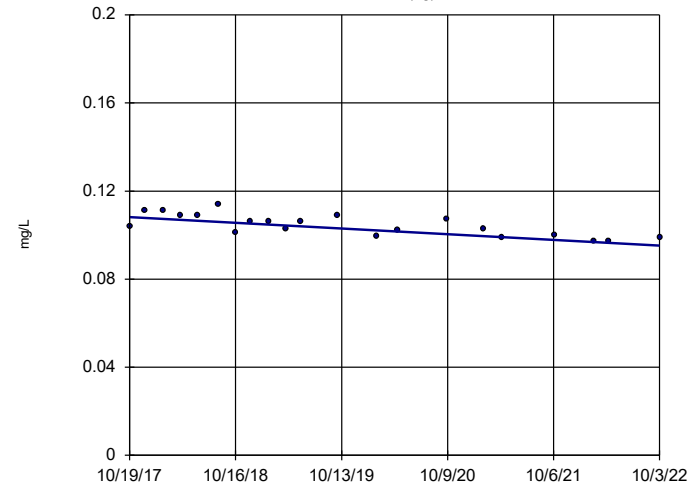


n = 21
 Slope = -0.02839
 units per year.
 Mann-Kendall
 statistic = -134
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Barium total Analysis Run 1/24/2023 4:38 PM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1602 (bg)

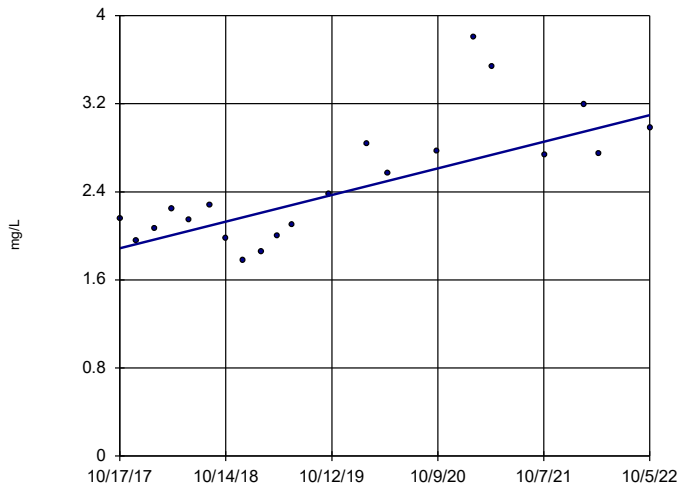


n = 21
 Slope = -0.0026
 units per year.
 Mann-Kendall
 statistic = -119
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Barium total Analysis Run 1/24/2023 4:38 PM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1603

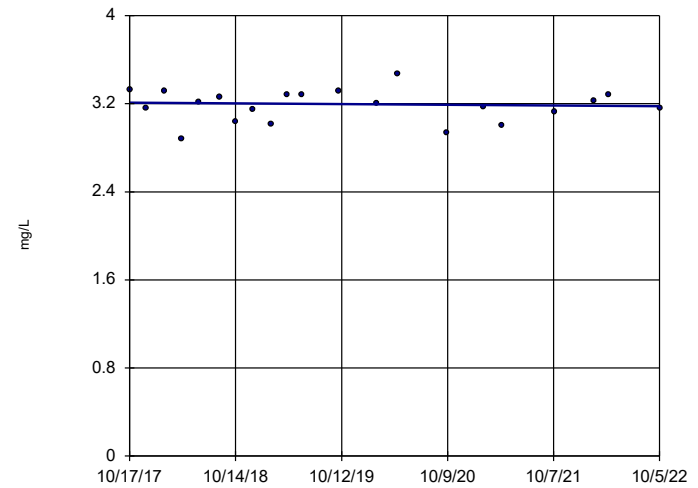


n = 21
 Slope = 0.2438
 units per year.
 Mann-Kendall
 statistic = 112
 critical = 87
 Increasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Barium total Analysis Run 1/24/2023 4:38 PM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1604

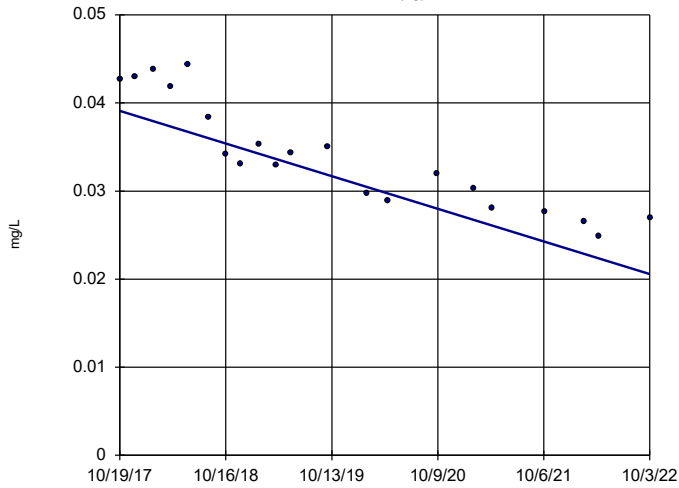


n = 21
 Slope = -0.006553
 units per year.
 Mann-Kendall
 statistic = -13
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Barium total Analysis Run 1/24/2023 4:38 PM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River LF Client: AEP Data: Clinch River

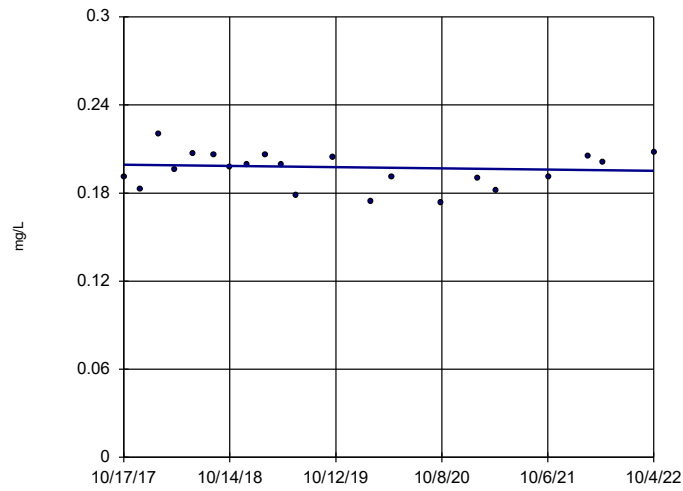
Sen's Slope Estimator

MW-1608 (bg)



Sen's Slope Estimator

MW-1605



Appendix IV Trend Tests - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 4:44 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Lithium total (mg/L)	MW-1609 (bg)	-0.001343	-98	-87	Yes	21	28.57	n/a	n/a	0.01	NP

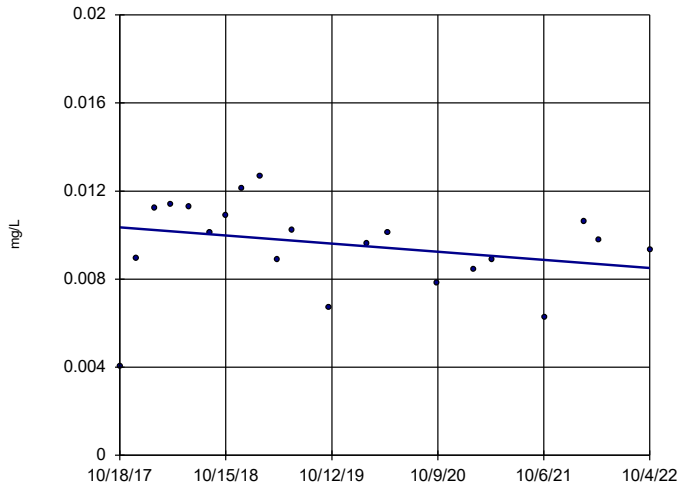
Appendix IV Trend Tests - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 4:44 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1607	-0.0003718	-42	-87	No	21	0	n/a	n/a	0.01	NP
Cobalt total (mg/L)	MW-1609 (bg)	-0.000039	-50	-87	No	21	14.29	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1606	-0.002243	-27	-87	No	21	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1607	0.000616	24	87	No	21	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1609 (bg)	-0.001343	-98	-87	Yes	21	28.57	n/a	n/a	0.01	NP
Molybdenum total (mg/L)	MW-1607	-0.005059	-53	-87	No	21	0	n/a	n/a	0.01	NP
Molybdenum total (mg/L)	MW-1609 (bg)	-0.0001343	-81	-87	No	21	23.81	n/a	n/a	0.01	NP

Sen's Slope Estimator

MW-1607



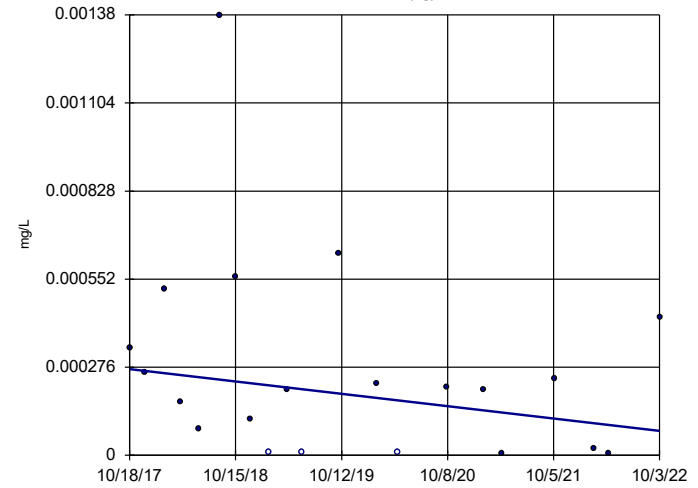
n = 21
 Slope = -0.0003718
 units per year.
 Mann-Kendall
 statistic = -42
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: Cobalt total Analysis Run 1/24/2023 4:43 PM View: Rome Limestone - Pond 1 Appendix IV Tr
 Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1609 (bg)

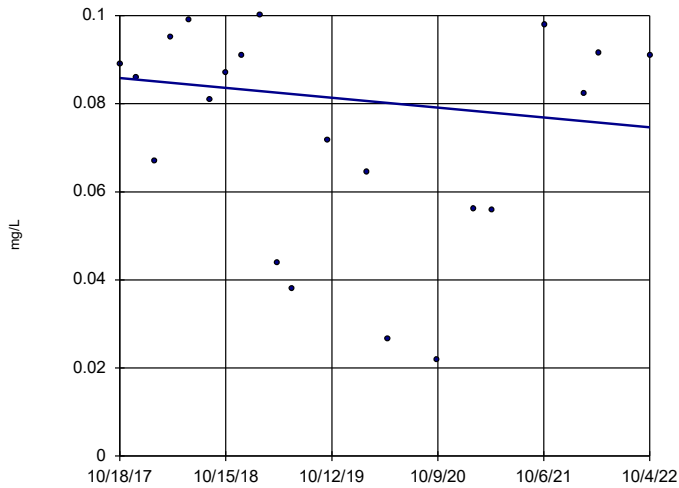


n = 21
 Slope = -0.000039
 units per year.
 Mann-Kendall
 statistic = -50
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: Cobalt total Analysis Run 1/24/2023 4:43 PM View: Rome Limestone - Pond 1 Appendix IV Tr
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1606

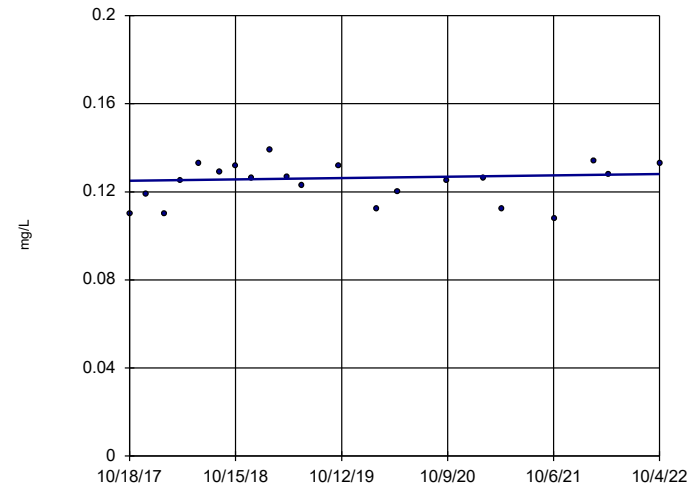


n = 21
 Slope = -0.002243
 units per year.
 Mann-Kendall
 statistic = -27
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: Lithium total Analysis Run 1/24/2023 4:43 PM View: Rome Limestone - Pond 1 Appendix IV T
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1607

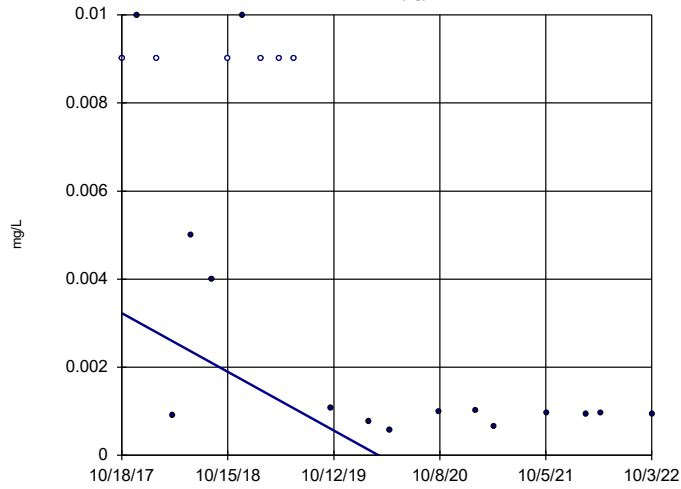


n = 21
 Slope = 0.000616
 units per year.
 Mann-Kendall
 statistic = 24
 critical = 87
 Trend not sig-
 nificant at 99%
 confidence level
 (α = 0.005 per
 tail).

Constituent: Lithium total Analysis Run 1/24/2023 4:43 PM View: Rome Limestone - Pond 1 Appendix IV T
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1609 (bg)

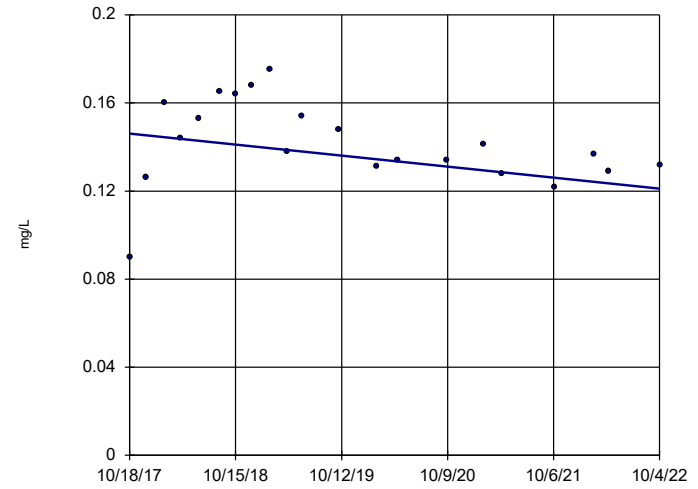


n = 21
 Slope = -0.001343
 units per year.
 Mann-Kendall
 statistic = -98
 critical = -87
 Decreasing trend
 significant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Lithium total Analysis Run 1/24/2023 4:43 PM View: Rome Limestone - Pond 1 Appendix IV T
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1607

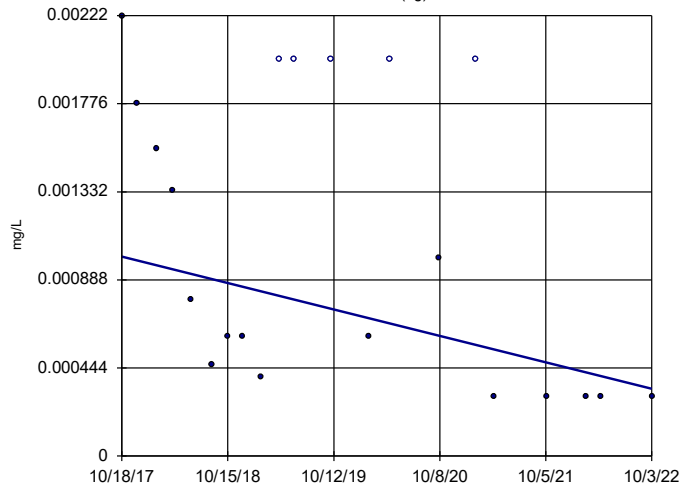


n = 21
 Slope = -0.005059
 units per year.
 Mann-Kendall
 statistic = -53
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Molybdenum total Analysis Run 1/24/2023 4:43 PM View: Rome Limestone - Pond 1 Appendi
 Clinch River LF Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1609 (bg)



n = 21
 Slope = -0.0001343
 units per year.
 Mann-Kendall
 statistic = -81
 critical = -87
 Trend not sig-
 nificant at 99%
 confidence level
 ($\alpha = 0.005$ per
 tail).

Constituent: Molybdenum total Analysis Run 1/24/2023 4:43 PM View: Rome Limestone - Pond 1 Appendi
 Clinch River LF Client: AEP Data: Clinch River

Appendix IV Trend Tests - Dumps Fault - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 4:29 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt total (mg/L)	MW-1610	-0.001425	-153	-87	Yes	21	0	n/a	n/a	0.01	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.00001829	-162	-81	Yes	20	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1611 (bg)	-0.01104	-151	-87	Yes	21	0	n/a	n/a	0.01	NP

Appendix IV Trend Tests - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 4:29 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1610	-0.001425	-153	-87	Yes	21	0	n/a	n/a	0.01	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.00001829	-162	-81	Yes	20	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1610	0.001065	6	87	No	21	0	n/a	n/a	0.01	NP
Lithium total (mg/L)	MW-1611 (bg)	-0.01104	-151	-87	Yes	21	0	n/a	n/a	0.01	NP
Molybdenum total (mg/L)	MW-1610	-0.007379	-25	-87	No	21	0	n/a	n/a	0.01	NP
Molybdenum total (mg/L)	MW-1611 (bg)	-0.0002106	-80	-81	No	20	0	n/a	n/a	0.01	NP

Sen's Slope Estimator

MW-1610

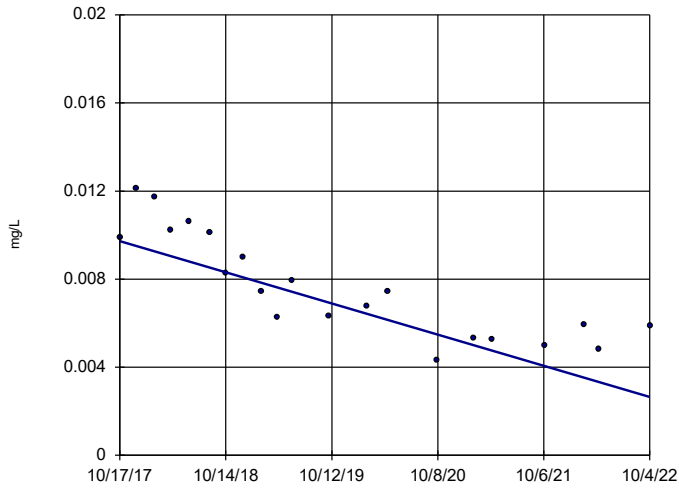


FIGURE L.

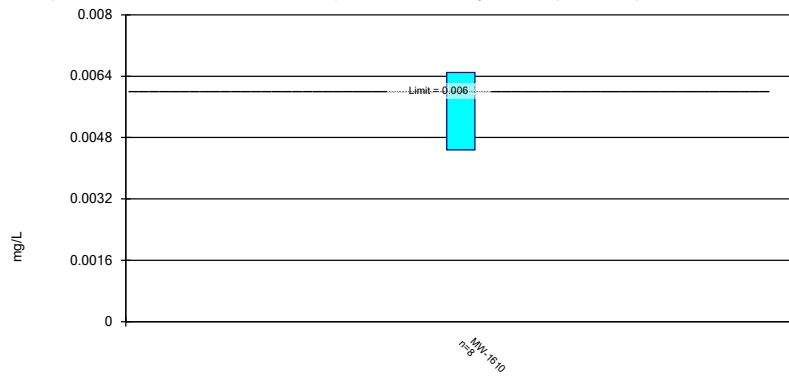
Confidence Interval (Most Recent 8) - Dumps Fault - All Results (No Significant)

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2023, 4:32 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt total (mg/L)	MW-1610	0.006495	0.004477	0.006	No	8	0.005486	0.000952	0	None	No	0.01	Param.

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 1/24/2023 4:31 PM View: Dumps Fault - Pond 1 Confidence Interva
Clinch River LF Client: AEP Data: Clinch River

STATISTICAL ANALYSIS SUMMARY, ASH POND 1

Clinch River Plant Carbo, Virginia

Prepared for

American Electric Power

1 Riverside Plaza

Columbus, Ohio 43215-2372

Prepared by

Geosyntec Consultants, Inc.

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Project Number: CHA8500B

September 7, 2023

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LIST OF ATTACHMENTS

Attachment A:	Certification by Qualified Professional Engineer
Attachment B:	Statistical Analysis Output

ACRONYMS AND ABBREVIATIONS

CCR	coal combustion residuals
CFR	Code of Federal Regulations
GWPS	groundwater protection standards
LCL	lower confidence limit
LPL	lower prediction limit
mg/L	milligrams per liter
pCi/L	picocuries per liter
QA/QC	quality assurance and quality control
SSI	statistically significant increase
SSL	statistically significant level
SU	standard units
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

In accordance with United States Environmental Protection Agency (USEPA) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (Code of Federal Regulations [CFR] Title 40, Section 257, Subpart D), groundwater monitoring has been conducted at Ash Pond 1, an existing CCR unit at the Clinch River Plant in Carbo, Virginia. Recent groundwater monitoring results were used to identify concentrations of Appendix IV constituents that are above the site-specific groundwater protection standards (GWPSs).

Eight monitoring events were completed from December 2017 to December 2018 to establish background concentrations for Appendix III and Appendix IV parameters under the CCR rule. Data collected through April 2019 were compared to the background concentrations to evaluate for any statistically significant increases (SSIs) or statistically significant levels (SSLs) of Appendix III or Appendix IV constituents.

SSLs and SSIs were identified for several constituents in groundwater. Because an alternative source of these constituents was not identified, an assessment of corrective measures was initiated for Ash Pond 1 in accordance with 40 CFR 257.96. The assessment of corrective measures has been conducted and the selection of a remedy is ongoing. Ash Pond 1 continues to undergo assessment monitoring in the interim.

An annual sampling event at Ash Pond 1 for Appendix III and Appendix IV parameters required by 40 CFR 257.95(b) was completed in February 2023, and a semiannual sampling event for Appendix III and Appendix IV parameters required by 40 CFR 257.95(d)(1) was completed in April 2023. The results of these annual and semiannual assessment monitoring events are documented in this report.

Monitoring data from the February and April 2023 events underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues that would impact data usability were identified.

Groundwater data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. The statistics were completed in three separate groups that correspond to differences in the underlying geology at the monitoring locations. Confidence intervals were calculated for Appendix IV parameters at the compliance wells to assess whether any were present at concentrations above the GWPSs. SSLs were identified for barium, cobalt, lithium, and molybdenum. Therefore, selection of the remedy will continue, and groundwater monitoring will continue in accordance with the assessment monitoring program as required by 40 CFR 275.96(b). Certification of the selected statistical methods by a qualified professional engineer is documented in Attachment A.

2. ASH POND 1 EVALUATION

2.1 Data Validation and QA/QC

During the assessment monitoring program, two sets of samples were collected for analysis from each upgradient and downgradient well throughout the three geologically distinct monitoring well networks to meet the requirements of 40 CFR 257.95b (February 2023) and 40 CFR 257.95(d)(1) (April 2023). The three geological units are the Chattanooga Shale, the Rome Limestone, and the Dumps Fault water-bearing units. A summary of data collected during these assessment monitoring events may be found in Table 1.

Chemical analysis was completed by a National Environmental Laboratory Accreditation Program-certified analytical laboratory. The laboratory completed analysis of quality assurance and quality control (QA/QC) samples such as laboratory reagent blanks, continuing calibration verification samples, and laboratory fortified blanks (LFBs).

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location information and analyte identification. Where necessary, unit conversions were applied to standardize reported units across all sampling events. Exported data files were created for use with the Sanitas™ v.9.6.36 statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues that would impact data usability were noted.

2.2 Statistical Analysis

Statistical analyses for Ash Pond 1 were conducted in accordance with the October 2020 Statistical Analysis Plan (Geosyntec Consultants, Inc. [Geosyntec] 2020). Time series plots and results for all completed statistical tests are provided in Attachment B.

The data obtained in February and April 2023 were screened for potential outliers. The February 2023 combined radium 226 and 228 value of 15.74 picocuries per liter (pCi/L) at MW-1602 (which is screened in the Chattanooga Shale formation) was identified as an outlier.

2.2.1 Evaluation of Potential Appendix IV SSLs

A confidence interval was constructed for each Appendix IV parameter at each compliance well. Confidence limits were generally calculated parametrically ($\alpha = 0.01$); however, nonparametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the nondetect frequency was too high). An SSL was concluded if the lower confidence limit (LCL) exceeded the GWPS (i.e., if the entire confidence interval exceeded the GWPS). The calculated confidence limits (Attachment B) were compared to the GWPSs (Table 2). The GWPSs were established during a previous statistical analysis as either (a) the background concentration or (b) the maximum contaminant level and risk-based level specified in 40 CFR 257.95(h)(2), whichever was greater. (Geosyntec 2023).

The following SSLs were identified at Clinch River Ash Pond 1 (Table 3):

- Chattanooga Shale

- LCLs for barium at MW-1603 (2.21 milligrams per liter [mg/L]), MW-1604 (3.10 mg/L), MW-1605 (2.17 mg/L) and MW-1612 (2.09 mg/L) were above the GWPS of 2.00 mg/L. The LCL for barium at MW-1605 was calculated using the most recent eight data points, as an increasing trend was observed.
- The LCL for lithium at MW-1605 (0.188 mg/L) was above the GWPS of 0.118 mg/L in the Chattanooga Shale formation.
- Rome Limestone
 - LCLs for lithium at MW-1606 (0.0618 mg/L) and MW-1607 (0.120 mg/L) were above the GWPS of 0.0400 mg/L.
 - The LCL for cobalt at MW-1607 (0.00845 mg/L) was above the GWPS of 0.00600 mg/L.
 - The LCL for molybdenum at MW-1607 (0.131 mg/L) was above the GWPS of 0.100 mg/L.
- Dumps Fault¹
 - The LCL for molybdenum at MW-1610 (0.120 mg/L) was above the GWPS of 0.100 mg/L.

While the LCL for cobalt at MW-1610 (0.00638 mg/L) was above the GWPS of 0.00600 mg/L when using the entire dataset, a statistically significant decreasing trend was observed. Therefore, the confidence interval for cobalt at MW-1610 was generated using only the most recent eight data points to better represent groundwater quality at present. The LCL for cobalt at MW-1610, when calculated using only the eight most recent data points, was 0.00479 mg/L, and an SSL was not identified.

As a result of the identified SSLs, the selection of a remedy will continue as required under 40 CFR 257.97, and the groundwater monitoring network will continue to be evaluated in accordance with the assessment monitoring program per 40 CFR 257.96(b).

2.2.2 Evaluation of Potential Appendix III SSIs

While SSLs were identified, a review of the Appendix III results was also completed to assess whether concentrations of Appendix III parameters at the compliance wells were above background concentrations. Data collected during the April 2023 assessment monitoring event from downgradient compliance wells were compared to previously calculated prediction limits to evaluate results above background values (Tables 4A through 4C). The following SSIs above the upper prediction limits (UPLs) were noted:

¹ An SSL was identified for lithium at MW-1610 based on the Sanitas output, which reported the LCL to four decimal places (0.1613 mg/L). However, a review of the analytical data found that use of three significant figures was more appropriate based on historical data reporting accuracy. When truncated to three significant figures, the LCL for lithium at MW-1610 (0.161 mg/L) is equal to the GWPS of 0.161 mg/L and an SSL is not identified.

- Calcium concentrations were above the Chattanooga Shale interwell UPL of 7.21 mg/L at MW-1603 (23.2 mg/L), MW-1604 (26.1 mg/L), MW-1605 (44.1 mg/L), and MW-1612 (52.3 mg/L).
- Chloride concentrations were above the Chattanooga Shale interwell UPL of 45.8 mg/L at MW-1603 (106 mg/L) and MW-1605 (146 mg/L). Chloride concentrations were above the Rome Limestone interwell UPL of 4.10 mg/L at MW-1606 (12.4 mg/L) and MW-1607 (6.14 mg/L).
- Sulfate concentrations were above the Rome Limestone interwell UPL of 20.8 mg/L at MW-1606 (45.7 mg/L) and MW-1607 (135 mg/L).

Additionally, the following statistically significant decreases below the lower prediction limits (LPLs) for pH were noted:

- pH values were below the Chattanooga Shale interwell LPL of 7.3 standard units (SU) for MW-1603 (6.7 SU) and MW-1612 (6.9 SU).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the initial (April 2023) sample was above the UPL or below the LPL.

2.3 Conclusions

Annual and semiannual assessment monitoring events were conducted in accordance with the CCR Rule. The laboratory and field data were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. A review of outliers identified one combined radium 226 and 228 result as an outlier (with a value of 15.74 pCi/L) in the February 2023 dataset. No other outliers were identified for the February or April 2023 events. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval was above the GWPS. SSLs were identified for barium, cobalt, molybdenum, and lithium.

Appendix III parameters were compared to previously calculated prediction limits. Calcium, chloride, and sulfate results were above background levels, and pH results were lower than background levels.

Based on this evaluation, the selection of a remedy for the Clinch River Ash Pond 1 CCR unit will continue, and the groundwater monitoring will continue in accordance with the assessment monitoring program per 40 CFR 257.96(b).

3. REFERENCES

Geosyntec. 2020. *Statistical Analysis Plan*. Geosyntec Consultants, Inc. October.

Geosyntec. 2023. *Statistical Analysis Summary – Ash Pond 1. Clinch River Plant, Carbo, Virginia*. Geosyntec Consultants, Inc. March.

TABLES

**Table 1: Groundwater Data Summary
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Parameter	Unit	MW-1601		MW-1602		MW-1603		MW-1604		MW-1605		MW-1606	
		2/13/2023	4/3/2023	2/13/2023	4/3/2023	2/14/2023	4/4/2023	2/14/2023	4/4/2023	2/14/2023	4/4/2023	2/14/2023	4/4/2023
Antimony	µg/L	0.03 J1	0.023 J1	0.06 J1	0.058 J1	0.07 J1	0.123	0.05 J1	0.023 J1	0.1 U1	0.012 J1	0.02 J1	0.1 U1
Arsenic	µg/L	4.47	4.08	1.66	1.47	2.74	2.34	3.89	2.36	1.00	0.74	8.06	6.87
Barium	µg/L	139	127	98.4	93.5	2,850	2,320	3,480	2,990	2,560	2,200	113	102
Beryllium	µg/L	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.008 J1	0.01 J1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.011 J1	0.25 U1
Boron	mg/L	0.534	0.538	0.597	0.591	0.233	0.199	0.432	0.436	0.558	0.535	0.142	0.136
Cadmium	µg/L	0.004 J1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.02 U1	0.026	0.02 U1
Calcium	mg/L	5.11	5.20	3.53	3.24	27.1	23.2	28.6	26.1	47.5	44.1	58.8	51.1
Chloride	mg/L	23.7	17.0	4.09	3.94	137	106	18.5	17.1	156	146	13.2	12.4
Chromium	µg/L	0.22	0.18 J1	0.18 J1	0.15 J1	0.21	0.18 J1	0.19 J1	0.16 J1	0.14 J1	0.16 J1	0.25	0.24 J1
Cobalt	µg/L	0.077	0.057	0.019 J1	0.021	0.219	0.199	0.154	0.144	0.046	0.039	4.65	3.55
Combined Radium	pCi/L	1.62	2.47	15.74	2.05	1.66	1.7	0.78	2.11	2.46	2.25	2.55	2.38
Fluoride	mg/L	2.32	2.39	1.76	1.76	0.10	0.09	0.29	0.28	0.31	0.28	0.19	0.20
Lead	µg/L	0.09 J1	0.06 J1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.86	0.32
Lithium	mg/L	0.0846	0.106 M1	0.0347	0.0362	0.0557	0.0522	0.0701	0.0781	0.177	0.189	0.0703	0.10
Mercury	µg/L	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1
Molybdenum	µg/L	0.8	0.8	0.7	0.7	1.9	0.3 J1	0.3 J1	0.2 J1	0.6	0.2 J1	55.0	62.1
Selenium	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.09 J1	0.09 J1	0.5 U1	0.04 J1	0.5 U1	0.5 U1	0.5 U1	0.06 J1
Sulfate	mg/L	270	168	17.1	15.2	0.41	0.3 J1	0.4 U1	0.6 U1	0.4 U1	0.6 U1	50.7	45.7
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.04 J1	0.02 J1
Total Dissolved Solids	mg/L	1,560	1,360	510	510	510	440	410	360	650	630	350	320
pH	SU	8.18	6.65	8.48	7.2	6.8	6.68	7.2	7.28	7.67	7.5	7.07	7.11

**Table 1: Groundwater Data Summary
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Parameter	Unit	MW-1607		MW-1608		MW-1609		MW-1610		MW-1611		MW-1612	
		2/14/2023	4/4/2023	2/13/2023	4/3/2023	2/13/2023	4/3/2023	2/13/2023	4/3/2023	2/13/2023	4/3/2023	2/14/2023	4/4/2023
Antimony	µg/L	0.03 J1	0.021 J1	0.1 U1	0.018 J1	0.1 U1	0.017 J1	0.06 J1	0.210	0.1 U1	0.013 J1	0.1 U1	0.023 J1
Arsenic	µg/L	1.56	1.32	1.23	0.77	0.10	0.05 J1	0.95	1.26	5.97	5.76	0.34	0.32
Barium	µg/L	70.2	63.2	26.4	21.6	423	388	292	275	280	287	2,620	2,520
Beryllium	µg/L	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.25 U1	0.05 U1	0.05 U1
Boron	mg/L	0.122	0.114	0.363	0.346	0.013 J1	0.01 J1	0.028 J1	0.026 J1	0.523	0.511	0.388	0.417
Cadmium	µg/L	0.054	0.078	0.005 J1	0.008 J1	0.009 J1	0.012 J1	0.02 U1	0.009 J1	0.02 U1	0.02 U1	0.02 U1	0.02 U1
Calcium	mg/L	42.7	42.0 M1	0.57	0.45	79.1	74.5	34.4	33.5	24.2	24.6	46.0	52.3
Chloride	mg/L	6.97	6.14	6.38	4.04	1.25	0.90	9.58	9.34	12.5	12.0	20.3	13.1
Chromium	µg/L	0.29	0.16 J1	0.27	0.80	0.19 J1	0.22 J1	0.18 J1	0.19 J1	0.15 J1	0.17 J1	0.23	0.21 J1
Cobalt	µg/L	8.54	10.2	0.117	0.093	0.220	0.014 J1	7.60	6.21	0.012 J1	0.012 J1	0.085	0.103
Combined Radium	pCi/L	2.02	1.81	2.05	1.31	2.33	2.39	1.71	2.92	2.13	2.62	1.92	2.23
Fluoride	mg/L	0.22	0.20	0.43	0.42	0.26	0.23	0.19	0.20	1.17	1.15	0.14	0.11
Lead	µg/L	0.33	0.53	0.09 J1	0.09 J1	0.23	0.21	2.53	1.29	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Lithium	mg/L	0.123	0.130	0.0169	0.0179	0.00085	0.0009	0.143	0.144	0.0542	0.063	0.112	0.125
Mercury	µg/L	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1	1 U1
Molybdenum	µg/L	135	131 M1	0.8	0.7	0.3 J1	0.3 J1	107	94.5	1.7	1.7	0.2 J1	0.1 J1
Selenium	µg/L	0.5 U1	0.06 J1	0.5 U1	0.5 U1	0.5 U1	0.32 J1	0.5 U1	0.09 J1	0.5 U1	0.5 U1	0.5 U1	0.5 U1
Sulfate	mg/L	140	135	173	149	15.0	14.7	15.9	13.8	27.4	24.3	0.4 U1	0.6 U1
Thallium	µg/L	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Total Dissolved Solids	mg/L	290	260	450	400	260	300	230	220	500	510	520	500
pH	SU	7.76	8	8.21	7.35	7.43	6.78	7.49	7.26	7.71	7.13	7.08	6.94

Notes:

-: Not sampled

µg/L: micrograms per liter

J: Estimated value. Parameter was detected in concentrations below the reporting limit.

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. For statistical analysis, parameters that were not detected were replaced with the reporting limit.

**Table 2A. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Chattanooga Shale Monitoring Well Network				
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000376	0.00600
Arsenic, Total (mg/L)	0.0100		0.0258	0.0258
Barium, Total (mg/L)	2.00		0.306	2.00
Beryllium, Total (mg/L)	0.00400		0.0000660	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000300	0.00500
Chromium, Total (mg/L)	0.100		0.00112	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.000383	0.00600
Combined Radium, Total (pCi/L)	5.00		2.62	5.00
Fluoride, Total (mg/L)	4.00		2.42	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000493	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.118	0.118
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.0257	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

**Table 2B. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Rome Limestone Monitoring Well Network				
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000105	0.00600
Arsenic, Total (mg/L)	0.0100		0.000970	0.0100
Barium, Total (mg/L)	2.00		0.512	2.00
Beryllium, Total (mg/L)	0.00400		0.0000500	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000400	0.00500
Chromium, Total (mg/L)	0.100		0.000321	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.00125	0.00600
Combined Radium, Total (pCi/L)	5.00		5.00	5.00
Fluoride, Total (mg/L)	4.00		0.337	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00119	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.0100	0.0400
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00222	0.100
Selenium, Total (mg/L)	0.0500		0.000391	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

**Table 2C. Appendix IV Groundwater Protection Standards
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Dumps Fault Monitoring Well Network				
Constituent Name	MCL	CCR Rule-Specified	Calculated UTL	GWPS
Antimony, Total (mg/L)	0.00600		0.000802	0.00600
Arsenic, Total (mg/L)	0.0100		0.0395	0.0395
Barium, Total (mg/L)	2.00		0.282	2.00
Beryllium, Total (mg/L)	0.00400		0.0000500	0.00400
Cadmium, Total (mg/L)	0.00500		0.0000200	0.00500
Chromium, Total (mg/L)	0.100		0.000923	0.100
Cobalt, Total (mg/L)	n/a	0.00600	0.000136	0.00600
Combined Radium, Total (pCi/L)	5.00		1.70	5.00
Fluoride, Total (mg/L)	4.00		1.38	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000200	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.161	0.161
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00552	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

- 1: Calculated UTL (Upper Tolerance Limit) represents site-specific background values
 - 2: Grey cells indicate the GWPS is based on the calculated UTL, which is higher than the MCL or CCR Rule-specified value.
- CCR: Coal Combustion Residuals
 GWPS: Groundwater Protection Standard
 MCL: Maximum Contaminant Level
 mg/L: milligrams per liter
 pCi/L: picocuries per liter

**Table 3. Appendix IV Identified Statistically Significant Levels
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Formation	Well ID	Constituent	GWPS	LCL
Chattanooga Shale	MW-1603	Barium	2.00	2.21
	MW-1604	Barium	2.00	3.10
	MW-1605	Barium	2.00	2.17
		Lithium	0.118	0.188
	MW-1612	Barium	2.000	2.09
Rome Limestone	MW-1606	Lithium	0.0400	0.0618
	MW-1607	Cobalt	0.00600	0.00845
		Lithium	0.0400	0.120
		Molybdenum	0.100	0.131
Dumps Fault	MW-1610	Cobalt	0.00600	0.00638
		Molybdenum	0.100	0.120

Notes:

1: All values are in mg/L

GWPS: Groundwater protection standard

LCL: lower confidence limit

mg/L: milligrams per liter

**Table 4a. Appendix III Data Summary: Chattanooga Shale Formation
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Analyte	Unit	Description	Chattanooga Shale			
			MW-1603	MW-1604	MW-1605	MW-1612
			4/4/2023	4/4/2023	4/4/2023	4/4/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.455	0.490	0.699	0.555
		Analytical Result	0.199	0.436	0.535	0.417
Calcium	mg/L	Interwell Background Value (UPL)	7.21			
		Analytical Result	23.2	26.1	44.1	52.3
Chloride	mg/L	Interwell Background Value (UPL)	45.8			
		Analytical Result	106	17.1	146	13.1
Fluoride	mg/L	Intrawell Background Value (UPL)	0.181	0.351	0.420	0.238
		Analytical Result	0.09	0.28	0.28	0.11
pH	SU	Interwell Background Value (UPL)	9.1			
		Interwell Background Value (LPL)	7.3			
		Analytical Result	6.7	7.3	7.5	6.9
Sulfate	mg/L	Intrawell Background Value (UPL)	3.11	1.67	11.2	1.40
		Analytical Result	0.3	0.1	0.1	0.1
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	785	427	732	560
		Analytical Result	440	360	630	500

**Table 4b. Appendix III Data Summary: Rome Limestone Formation
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Analyte	Unit	Description	Rome Limestone	
			MW-1606	MW-1607
			4/4/2023	4/4/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.189	0.212
		Analytical Result	0.136	0.114
Calcium	mg/L	Intrawell Background Value (UPL)	64.0	52.2
		Analytical Result	51.1	42.0
Chloride	mg/L	Interwell Background Value (UPL)	4.10	
		Analytical Result	12.4	6.14
Fluoride	mg/L	Intrawell Background Value (UPL)	0.271	0.268
		Analytical Result	0.20	0.20
pH	SU	Intrawell Background Value (UPL)	7.4	8.3
		Intrawell Background Value (LPL)	6.7	7.2
		Analytical Result	7.1	8.0
Sulfate	mg/L	Interwell Background Value (UPL)	20.8	
		Analytical Result	45.7	135
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	377	313
		Analytical Result	320	260

**Table 4c. Appendix III Data Summary: Dumps Fault Formation
Statistical Analysis Summary
Clinch River Plant - Ash Pond 1**

Analyte	Unit	Description	Dumps Fault
			MW-1610 4/3/2023
Boron	mg/L	Intrawell Background Value (UPL)	0.102
		Analytical Result	0.026
Calcium	mg/L	Intrawell Background Value (UPL)	39.5
		Analytical Result	33.5
Chloride	mg/L	Intrawell Background Value (UPL)	12.2
		Analytical Result	9.34
Fluoride	mg/L	Intrawell Background Value (UPL)	0.350
		Analytical Result	0.20
pH	SU	Intrawell Background Value (UPL)	8.1
		Intrawell Background Value (LPL)	7.1
		Analytical Result	7.3
Sulfate	mg/L	Intrawell Background Value (UPL)	52.8
		Analytical Result	13.8
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	268
		Analytical Result	220

Notes:

1: Background values are shaded gray.

2: **Bold values exceed the background value.**

LPL: lower prediction limit

mg/L: milligrams per liter

SU: standard units

UPL: upper prediction limit

ATTACHMENT A

Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

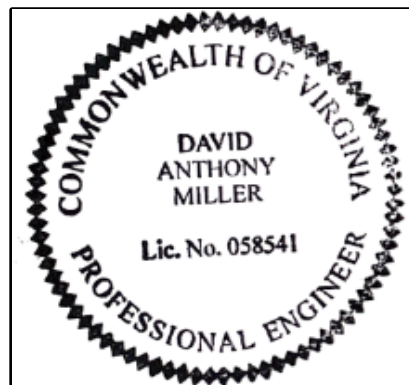
I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Clinch River Ash Pond 1 CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



058541

License Number

Virginia

Licensing State

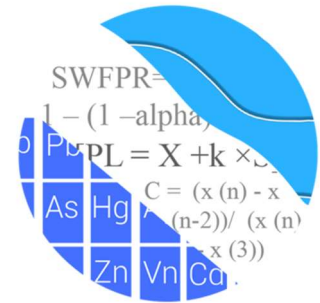
09.10.2023

Date

ATTACHMENT B

Statistical Analysis Output

GROUNDWATER STATS CONSULTING



September 5, 2023

Geosyntec Consultants
Attn: Ms. Allison Kreinberg
941 Chatham Lane, #103
Worthington, OH 43221

RE: Clinch River Pond 1 – Assessment Monitoring Report – February/April 2023

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the statistical evaluation of groundwater data for the February/April 2023 sample event at American Electric Power Company's Clinch River Pond 1. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the Clinch River Pond 1 for the Coal Combustion Residuals (CCR) program in 2017 at each of the groundwater monitoring wells. The monitoring well network, as provided by Geosyntec Consultants, consists of the following three formations:

Chattanooga Shale:

Upgradient Wells: MW-1601, MW-1602, MW-1608

Downgradient Wells: MW-1603, MW-1604, MW-1605, MW-1612

Rome Limestone:

Cross-gradient (background) Well: MW-1609

Downgradient Wells: MW-1606, MW-1607

Dumps Fault:

Upgradient Well: MW-1611

Downgradient Well: MW-1610

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was reviewed by Kristina Rayner, Founder and Senior Statistician for Groundwater Stats Consulting.

The CCR program consists of the following Assessment Monitoring constituents listed below. The terms "constituent" and "parameter" are interchangeable.

- **Appendix IV** (Assessment Monitoring) – antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 + 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium

For all constituents, a substitution of the most recent reporting limit is used for non-detect data. In the time series plots, a single reporting limit substitution is used across all wells for a given parameter since the wells are plotted as a group. Note that when there are no detections present in downgradient wells for a given constituent, statistical analyses are not required. A summary of well/constituent pairs containing 100% non-detects follows this letter.

A separate section is provided for each formation and includes time series plots for Appendix IV parameters at all wells within the same formation for the purpose of screening data (Figure A for each formation). Additionally, box plots are included for all constituents at upgradient and downgradient wells (Figure B for each formation). The time series plots are used to initially screen for suspected outliers and trends, while the box plots provide visual representation of variation within individual wells and between all wells.

Summary of Statistical Methods:

Parametric tolerance limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are non-detects, a nonparametric test is utilized. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. After testing for normality and performing any adjustments as discussed below (USEPA, 2009), data are analyzed using either parametric or non-parametric prediction limits as appropriate. Non-detects are handled as follows:

- No statistical analyses are required on wells and analytes containing 100% non-detects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% non-detects, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for

non-detects is the most recent practical quantification limit (PQL) as reported by the laboratory.

- When data contain between 15-50% non-detects, the Kaplan-Meier non-detect adjustment is applied to the background data. This technique adjusts the mean and standard deviation of the historical concentrations to account for concentrations below the reporting limit.
- Nonparametric tolerance limits are used on data containing greater than 50% non-detects.

Evaluation of Appendix IV Parameters – February & April 2023

Groundwater Protections Standards (GWPS) are updated annually with the last update conducted during the Fall 2022 semi-annual statistical analysis. The GWPS will be updated again during the Fall 2023 semi-annual statistical analysis. The methodology used to create these GWPS is described below.

Outlier Analysis

Background data were originally screened in June 2019 and all data were re-screened during the October 2021 and October 2022 sample events. The results were submitted with each respective report. During this analysis, data at all wells were re-evaluated through April 2023 using time series plots to confirm previously identified outliers as well as identify new outliers and extreme trending patterns that would lead to artificially elevated statistical limits. Note that for the downgradient well data that are evaluated with confidence intervals, a regulatory conservative approach is taken in that values that are marginally high relative to the rest of the data are retained unless there is particular justification for excluding them. A high value for combined radium at upgradient well MW-1602 were flagged during this analysis. Any flagged values, as further discussed below, may be seen on the Outlier Summary table for each formation following this letter.

In January 2023, following the second semi-annual event of 2022, Tukey's outlier test on pooled upgradient well data for Chattanooga Shale and Rome Limestone did not identify any potential outliers, and none were flagged. For Dumps Fault Tukey's test identified a high value of molybdenum for well MW-1611 which was flagged as an outlier in the database. Additionally, high values for cobalt and lead in upgradient well MW-1611 were identified visually and flagged prior to construction of upper tolerance limits. The Maximum Contaminant Levels, however, were used as the Groundwater Protection Standard for these constituents in these cases; therefore, these values had no effect on the upper tolerance limits. Values identified as outliers are flagged with "o" and displayed

in a lighter font and disconnected symbol on the time series graphs. Summaries of all flagged outliers are included in Figure C for each of the three formations.

Interwell Upper Tolerance Limits

Interwell upper tolerance limits were calculated to create background limits for the Appendix IV constituents from all available pooled upgradient well data through October 2022 at each of the formations (Figures D). Parametric limits use a target of 95% confidence and 95% coverage. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. The background limit for lithium was reported to three significant figures where applicable, as requested by Geosyntec Consultants. The upper tolerance limits were last updated in January 2023 and will be updated during the 2023 2nd semi-annual analysis.

Groundwater Protection Standards

Interwell upper tolerance limits were compared to the Maximum Contaminant Levels (MCLs) and CCR-Rule specified levels, as shown in the Groundwater Protection Standards (GWPS) table following this letter (Figures E), to determine the highest limit for use as the GWPS in the Confidence Interval comparisons.

Confidence Intervals

Confidence intervals were then constructed for each Appendix IV constituent and each downgradient well using data through April 2023 (Figures F). These intervals were constructed as either parametric or nonparametric confidence intervals depending on the data distribution and percentage of non-detects. When data followed a normal or transformed-normal distribution, parametric confidence intervals were used for Appendix IV parameters. Nonparametric confidence intervals were constructed when data did not follow a normal or transformed-normal distribution or when there were greater than 50% non-detects. The lower confidence limit, which is constructed with 99% confidence for parametric confidence intervals, is compared to the GWPS prepared as described above. The confidence level associated with nonparametric confidence intervals is dependent upon the number samples available.

Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete results of the confidence interval analysis follow this letter. The following confidence interval exceedances were identified using all available data within each well:

Chattanooga Shale

- Barium: MW-1603, MW-1604, and MW-1612
- Lithium: MW-1605

Rome Limestone

- Cobalt: MW-1607
- Lithium: MW-1606 and MW-1607
- Molybdenum: MW-1607

Dumps Fault

- Cobalt: MW-1610
- Molybdenum: MW-1610

Note that no confidence interval exceedance was identified for barium in well MW-1605 at Chattanooga Shale when evaluating the entire record. However, more recent concentrations of barium at this well are higher than those reported historically. Therefore, an additional confidence interval was constructed using the most recent 8 measurements and the lower confidence interval of 2.17 mg/L was found to exceed the respective GWPS of 2.0 mg/L. (Figure H). Additionally, an SSL was identified for lithium at MW-1610 based on the Sanitas output, which originally reported the LCL to four decimal places (0.1613 mg/L). A review of the analytical data found that use of three significant figures was more appropriate based on historical data reporting accuracy. When truncated to three significant figures, although the Sanitas software identifies a significant result, the LCL for lithium at MW-1610 (0.161 mg/L) is equal to the GWPS of 0.161 mg/L which does not result in an SSL.

Trend Test Evaluation – Appendix IV

Data at wells with confidence interval exceedances are further evaluated using the Sen's Slope/Mann Kendall trend test at the 95% confidence level to determine whether concentrations are statistically increasing, decreasing, or stable (Figures G). Previously, trend analyses were performed for the Appendix IV constituents at the 99% confidence level (i.e., 1% false positive rate). In order to identify whether statistically significant trends are present for these constituents, the 95% confidence level is used instead of the 99% confidence level and is more sensitive to detecting significant trends due to the increased false positive rate.

Upgradient wells are included in the trend analyses to identify whether similar patterns exist upgradient of the site for the same constituents. When trends are present in upgradient trends, it is an indication of natural variability in groundwater quality unrelated

to practices at the site. A summary of the Appendix IV trend test results follows this letter. Statistically significant trends were identified for the following well/constituent pairs:

Increasing

Chattanooga Shale

- Barium: MW-1603, MW-1605, and MW-1612

Rome Limestone

- None

Dumps Fault

- None

Decreasing

Chattanooga Shale

- Barium: MW-1601 MW-1602, and MW-1608 (all upgradient)
- Lithium: MW-1602 and MW-1608 (both upgradient)

Rome Limestone

- Lithium: MW-1609 (upgradient)
- Molybdenum: MW-1609 (upgradient)

Dumps Fault

- Cobalt: MW-1611 (upgradient) and MW-1610
- Molybdenum: MW-1611 (upgradient)

Note that the decreasing trends for lithium and molybdenum at Rome Limestone are a byproduct of reporting limits earlier in the record compared to trace values later in the record.

Confidence Intervals – Most Recent 8 Measurements

Downgradient well/constituent pairs that meet both of the following criteria are further evaluated with confidence intervals using only the most recent 8 measurements through April 2023 to determine present-day groundwater quality conditions relative to the respective GWPSs:

- Exceedance of the respective GWPS when using the entire record of data
- Statistically significant decreasing trends

This includes cobalt in downgradient well MW-1610 at Dumps Fault, which was the only downgradient well/constituent pair to meet these criteria. The confidence interval was

compared against the same respective GWPS to assess compliance. Only when the entire confidence interval is above a GWPS is the well/constituent pair considered to exceed its respective standard. Complete results of the confidence interval analysis follow this letter and no exceedance was identified for cobalt at well MW-1610.

Thank you for the opportunity to assist you in the statistical analysis of groundwater quality for the Clinch River Pond 1. If you have any questions or comments, please feel free to contact us.

For Groundwater Stats Consulting,



Andrew T. Collins
Project Manager



Kristina L. Rayner
Senior Statistician

100% Non-Detects: Appendix IV Downgradient Chattanooga Shale

Analysis Run 6/14/2023 10:59 AM View: Chattanooga Shale - Pond 1 Confidence Intervals
Clinch River LF Client: AEP Data: Clinch River

Cadmium total (mg/L)
MW-1603, MW-1604, MW-1612

Mercury total (mg/L)
MW-1605

Tolerance Limits Summary Table - Chattanooga Shale - All Results

Clinch River Client: AEP Data: Clinch River Printed 1/12/2023, 4:14 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig. Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony total (mg/L)	0.0003757	n/a	n/a	n/a	n/a 63	-9.538	0.8229	3.175	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	0.0258	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Barium total (mg/L)	0.306	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Beryllium total (mg/L)	0.000066	n/a	n/a	n/a	n/a 63	n/a	n/a	65.08	n/a	n/a	0.0395	NP Inter(NDs)
Cadmium total (mg/L)	0.00003	n/a	n/a	n/a	n/a 63	n/a	n/a	85.71	n/a	n/a	0.0395	NP Inter(NDs)
Chromium total (mg/L)	0.001118	n/a	n/a	n/a	n/a 63	-8.217	0.708	1.587	None	ln(x)	0.05	Inter
Cobalt total (mg/L)	0.0003833	n/a	n/a	n/a	n/a 63	0.04558	0.01349	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	2.621	n/a	n/a	n/a	n/a 63	0.8998	0.2387	0	None	x^(1/3)	0.05	Inter
Fluoride total (mg/L)	2.42	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Lead total (mg/L)	0.0004926	n/a	n/a	n/a	n/a 63	0.0452	0.01683	25.4	Kaplan-Meier	x^(1/3)	0.05	Inter
Lithium total (mg/L)	0.118	n/a	n/a	n/a	n/a 63	n/a	n/a	1.587	n/a	n/a	0.0395	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 63	n/a	n/a	88.89	n/a	n/a	0.0395	NP Inter(NDs)
Molybdenum total (mg/L)	0.0257	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Selenium total (mg/L)	0.0005	n/a	n/a	n/a	n/a 63	n/a	n/a	49.21	n/a	n/a	0.0395	NP Inter(normality)
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 63	n/a	n/a	77.78	n/a	n/a	0.0395	NP Inter(NDs)

Tolerance Limits Summary Table - Rome Limestone - All Results

Clinch River Client: AEP Data: Clinch River Printed 1/13/2023, 4:32 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig. Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony total (mg/L)	0.0001053	n/a	n/a	n/a	n/a 21	0.005718	0.001917	9.524	None	sqrt(x)	0.05	Inter
Arsenic total (mg/L)	0.00097	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Barium total (mg/L)	0.5118	n/a	n/a	n/a	n/a 21	0.3951	0.04923	0	None	No	0.05	Inter
Beryllium total (mg/L)	0.00005	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Cadmium total (mg/L)	0.00004	n/a	n/a	n/a	n/a 21	n/a	n/a	19.05	n/a	n/a	0.3406	NP Inter(normality)
Chromium total (mg/L)	0.0003212	n/a	n/a	n/a	n/a 21	0.0001565	0.00006946	9.524	None	No	0.05	Inter
Cobalt total (mg/L)	0.00125	n/a	n/a	n/a	n/a 21	0.01377	0.009102	14.29	None	sqrt(x)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	4.999	n/a	n/a	n/a	n/a 21	1.407	0.3494	0	None	sqrt(x)	0.05	Inter
Fluoride total (mg/L)	0.337	n/a	n/a	n/a	n/a 21	0.2543	0.03487	0	None	No	0.05	Inter
Lead total (mg/L)	0.001186	n/a	n/a	n/a	n/a 21	0.01924	0.006408	0	None	sqrt(x)	0.05	Inter
Lithium total (mg/L)	0.01	n/a	n/a	n/a	n/a 21	n/a	n/a	28.57	n/a	n/a	0.3406	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Molybdenum total (mg/L)	0.00222	n/a	n/a	n/a	n/a 21	n/a	n/a	23.81	n/a	n/a	0.3406	NP Inter(normality)
Selenium total (mg/L)	0.0003912	n/a	n/a	n/a	n/a 21	0.008041	0.00495	28.57	Kaplan-Meier	sqrt(x)	0.05	Inter
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 21	n/a	n/a	76.19	n/a	n/a	0.3406	NP Inter(NDs)

Tolerance Limits Summary Table - Dumps Fault - All Results

Clinch River Client: AEP Data: Clinch River Printed 1/13/2023, 4:11 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig. Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony total (mg/L)	0.0008018	n/a	n/a	n/a	n/a 21	-9.577	1.033	14.29	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	0.0395	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Barium total (mg/L)	0.2823	n/a	n/a	n/a	n/a 21	0.3274	0.08602	0	None	sqrt(x)	0.05	Inter
Beryllium total (mg/L)	0.00005	n/a	n/a	n/a	n/a 21	n/a	n/a	76.19	n/a	n/a	0.3406	NP Inter(NDs)
Cadmium total (mg/L)	0.00002	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Chromium total (mg/L)	0.0009231	n/a	n/a	n/a	n/a 21	0.0003836	0.0002275	0	None	No	0.05	Inter
Cobalt total (mg/L)	0.0001361	n/a	n/a	n/a	n/a 20	0.0000498	0.000036	0	None	No	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	1.698	n/a	n/a	n/a	n/a 21	0.648	0.443	0	None	No	0.05	Inter
Fluoride total (mg/L)	1.375	n/a	n/a	n/a	n/a 21	0.9571	0.1762	0	None	No	0.05	Inter
Lead total (mg/L)	0.0002	n/a	n/a	n/a	n/a 20	n/a	n/a	40	n/a	n/a	0.3585	NP Inter(normality)
Lithium total (mg/L)	0.161	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Molybdenum total (mg/L)	0.005519	n/a	n/a	n/a	n/a 20	-6.138	0.3916	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	0.0005	n/a	n/a	n/a	n/a 21	n/a	n/a	23.81	n/a	n/a	0.3406	NP Inter(normality)
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 21	n/a	n/a	85.71	n/a	n/a	0.3406	NP Inter(NDs)

CLINCH RIVER GWPS - CHATTANOOGA SHALE				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00038	0.006
Arsenic, Total (mg/L)	0.01		0.026	0.026
Barium, Total (mg/L)	2		0.31	2
Beryllium, Total (mg/L)	0.004		0.000066	0.004
Cadmium, Total (mg/L)	0.005		0.00003	0.005
Chromium, Total (mg/L)	0.1		0.00112	0.1
Cobalt, Total (mg/L)		0.006	0.00038	0.006
Combined Radium, Total (pCi/L)	5		2.62	5
Fluoride, Total (mg/L)	4		2.42	4
Lead, Total (mg/L)		0.015	0.00049	0.015
Lithium, Total (mg/L)		0.04	0.118	0.118
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.026	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**Grey cell indicates background is higher than MCL or CCR Rule*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - ROME LIMESTONE				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00011	0.006
Arsenic, Total (mg/L)	0.01		0.00097	0.01
Barium, Total (mg/L)	2		0.51	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00004	0.005
Chromium, Total (mg/L)	0.1		0.00032	0.1
Cobalt, Total (mg/L)		0.006	0.0013	0.006
Combined Radium, Total (pCi/L)	5		5	5
Fluoride, Total (mg/L)	4		0.34	4
Lead, Total (mg/L)		0.015	0.0012	0.015
Lithium, Total (mg/L)		0.04	0.01	0.04
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0022	0.1
Selenium, Total (mg/L)	0.05		0.00039	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - DUMPS FAULT				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.0008	0.006
Arsenic, Total (mg/L)	0.01		0.04	0.04
Barium, Total (mg/L)	2		0.28	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00002	0.005
Chromium, Total (mg/L)	0.1		0.00092	0.1
Cobalt, Total (mg/L)		0.006	0.00014	0.006
Combined Radium, Total (pCi/L)	5		1.7	5
Fluoride, Total (mg/L)	4		1.38	4
Lead, Total (mg/L)		0.015	0.0002	0.015
Lithium, Total (mg/L)		0.04	0.161	0.161
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0055	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**Grey cell indicates background is higher than MCL or CCR Rule*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

Confidence Interval - Chattanooga Shale - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:39 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium total (mg/L)	MW-1603	2.775	2.209	2	Yes	23	2.492	0.5409	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.269	3.104	2	Yes	23	3.187	0.1572	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.384	2.085	2	Yes	22	2.235	0.2779	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2007	0.1878	0.118	Yes	23	0.1943	0.01241	0	None	No	0.01	Param.

Confidence Interval - Chattanooga Shale - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1603	0.0005348	0.00002417	0.006	No	23	0.0000523	0.00002908	17.39	Kaplan-Meier	No	0.01	Param.
Antimony total (mg/L)	MW-1604	0.00007168	0.00002788	0.006	No	23	0.00006883	0.00008654	13.04	None	ln(x)	0.01	Param.
Antimony total (mg/L)	MW-1605	0.00009106	0.00003906	0.006	No	23	0.00007183	0.00006349	13.04	None	sqrt(x)	0.01	Param.
Antimony total (mg/L)	MW-1612	0.00006353	0.00002359	0.006	No	22	0.00007195	0.00006356	22.73	Kaplan-Meier	x^(1/3)	0.01	Param.
Arsenic total (mg/L)	MW-1603	0.00276	0.002141	0.026	No	23	0.00245	0.0005912	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1604	0.002949	0.001912	0.026	No	23	0.00243	0.0009913	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1605	0.003964	0.002115	0.026	No	23	0.00304	0.001767	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1612	0.001082	0.0004823	0.026	No	22	0.0009818	0.0009163	0	None	ln(x)	0.01	Param.
Barium total (mg/L)	MW-1603	2.775	2.209	2	Yes	23	2.492	0.5409	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.269	3.104	2	Yes	23	3.187	0.1572	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1605	1.964	1.422	2	No	23	1.693	0.5182	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.384	2.085	2	Yes	22	2.235	0.2779	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1603	0.00005	0.00001	0.004	No	23	0.00003926	0.00001849	73.91	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1604	0.00005	0.000007	0.004	No	23	0.00004617	0.00001268	91.3	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1605	0.00005	0.00001	0.004	No	23	0.0000443	0.00001507	86.96	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1612	0.00005	0.000045	0.004	No	22	0.00004391	0.00001507	81.82	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1605	0.00002	0.00001	0.005	No	23	0.00001957	0.000002085	91.3	None	No	0.01	NP (NDs)
Chromium total (mg/L)	MW-1603	0.0002431	0.000161	0.1	No	23	0.0002093	0.00008708	0	None	x^(1/3)	0.01	Param.
Chromium total (mg/L)	MW-1604	0.000248	0.000116	0.1	No	23	0.0002498	0.0003267	0	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1605	0.0002621	0.0001695	0.1	No	23	0.0002158	0.00008854	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1612	0.000218	0.00018	0.1	No	22	0.0002061	0.00008221	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1603	0.0005014	0.000273	0.006	No	23	0.0003872	0.0002184	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1604	0.000635	0.0003506	0.006	No	23	0.0004928	0.0002718	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1605	0.000316	0.00004	0.006	No	23	0.0001783	0.0001402	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1612	0.0001985	0.0001203	0.006	No	22	0.0001672	0.00008137	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1603	1.637	0.9344	5	No	23	1.286	0.6713	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1604	1.55	1.01	5	No	23	1.28	0.5163	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1605	2.159	1.132	5	No	23	1.704	1.316	0	None	No	0.01	NP (normality)
Combined Radium 226 and 228 (pCi/L)	MW-1612	2.24	1.442	5	No	22	1.841	0.7435	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1603	0.1349	0.1085	4	No	23	0.1226	0.02649	0	None	sqrt(x)	0.01	Param.
Fluoride total (mg/L)	MW-1604	0.2872	0.2415	4	No	23	0.2643	0.04378	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1605	0.3659	0.3272	4	No	23	0.3465	0.037	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1612	0.1812	0.1433	4	No	22	0.1623	0.03531	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1603	0.0002	0.000038	0.015	No	23	0.0001524	0.00008205	73.91	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1604	0.0002	0.00006	0.015	No	23	0.0001493	0.00007932	69.57	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1605	0.0002	0.00005	0.015	No	23	0.0001342	0.00007749	56.52	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1612	0.0002	0.000083	0.015	No	22	0.000164	0.00007989	68.18	None	No	0.01	NP (NDs)
Lithium total (mg/L)	MW-1603	0.07743	0.05857	0.118	No	23	0.068	0.01803	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1604	0.08196	0.07448	0.118	No	23	0.07822	0.007147	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2007	0.1878	0.118	Yes	23	0.1943	0.01241	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1612	0.1285	0.1107	0.118	No	22	0.1183	0.02004	4.545	None	x^2	0.01	Param.
Mercury total (mg/L)	MW-1603	0.001	0.00006	0.002	No	23	0.0009591	0.000196	95.65	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1604	0.001	0.00006	0.002	No	23	0.0009591	0.000196	95.65	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1612	0.001	0.00006	0.002	No	22	0.0009573	0.0002004	95.45	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1603	0.001147	0.0005265	0.1	No	23	0.001057	0.001025	0	None	ln(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1604	0.0005407	0.0002505	0.1	No	23	0.0008404	0.000697	17.39	Kaplan-Meier	ln(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1605	0.00305	0.0009631	0.1	No	23	0.002372	0.002408	0	None	sqrt(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1612	0.001098	0.0003837	0.1	No	22	0.0008468	0.0008254	4.545	None	sqrt(x)	0.01	Param.
Selenium total (mg/L)	MW-1603	0.00011	0.00007	0.05	No	23	0.0001535	0.0001636	17.39	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1604	0.0005	0.00005	0.05	No	23	0.0002452	0.0002287	43.48	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1605	0.0005	0.00007	0.05	No	23	0.0003265	0.0002214	60.87	None	No	0.01	NP (NDs)
Selenium total (mg/L)	MW-1612	0.0005	0.00004	0.05	No	22	0.0003141	0.0002291	59.09	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1603	0.0002	0.00002	0.002	No	23	0.0001591	0.00007931	78.26	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1604	0.0002	0.00002	0.002	No	23	0.0001674	0.00007269	82.61	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1605	0.0002	0.00002	0.002	No	23	0.0001678	0.00007173	82.61	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1612	0.0002	0.00003	0.002	No	22	0.0001664	0.00007313	81.82	None	No	0.01	NP (NDs)

Confidence Interval - Rome Limestone - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:56 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt total (mg/L)	MW-1607	0.01051	0.008448	0.006	Yes	23	0.009479	0.001971	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.08666	0.06175	0.04	Yes	23	0.0742	0.02381	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.1288	0.1196	0.04	Yes	23	0.1242	0.008763	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1506	0.131	0.1	Yes	23	0.1408	0.0187	0	None	No	0.01	Param.

Confidence Interval - Rome Limestone - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:56 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1606	0.0001	0.00002	0.006	No	23	0.00005913	0.00003716	43.48	None	No	0.01	NP (normality)
Antimony total (mg/L)	MW-1607	0.00005157	0.00003025	0.006	No	23	0.00004091	0.00002038	4.348	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1606	0.00833	0.00689	0.01	No	23	0.008021	0.002301	0	None	No	0.01	NP (normality)
Arsenic total (mg/L)	MW-1607	0.0015	0.001	0.01	No	23	0.001515	0.001082	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1606	0.117	0.1073	2	No	23	0.1121	0.009236	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1607	0.0742	0.0679	2	No	23	0.074	0.0158	0	None	No	0.01	NP (normality)
Beryllium total (mg/L)	MW-1606	0.00025	0.000008	0.004	No	23	0.0001451	0.0001223	56.52	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1607	0.00005	0.000005	0.004	No	23	0.00004804	0.000009383	95.65	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1606	0.00002	0.00001	0.005	No	23	0.00001861	0.000007762	39.13	None	No	0.01	NP (normality)
Cadmium total (mg/L)	MW-1607	0.0001517	0.00009391	0.005	No	23	0.0001228	0.00005529	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1606	0.0002678	0.0001783	0.1	No	23	0.0002365	0.0001089	0	None	ln(x)	0.01	Param.
Chromium total (mg/L)	MW-1607	0.0002407	0.0001325	0.1	No	23	0.0002106	0.0001527	8.696	None	ln(x)	0.01	Param.
Cobalt total (mg/L)	MW-1606	0.005297	0.004247	0.006	No	23	0.004772	0.001004	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1607	0.01051	0.008448	0.006	Yes	23	0.009479	0.001971	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1606	2.41	1.408	5	No	23	1.993	1.128	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1607	1.421	0.8174	5	No	23	1.119	0.577	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1606	0.2217	0.1844	4	No	23	0.203	0.0356	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1607	0.2351	0.2101	4	No	23	0.2226	0.02397	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1606	0.0006382	0.0004084	0.015	No	23	0.0005233	0.0002197	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1607	0.0005688	0.0004056	0.015	No	23	0.0004872	0.000156	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.08666	0.06175	0.04	Yes	23	0.0742	0.02381	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.1288	0.1196	0.04	Yes	23	0.1242	0.008763	0	None	No	0.01	Param.
Mercury total (mg/L)	MW-1606	0.001	0.00006	0.002	No	23	0.0009591	0.000196	95.65	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1607	0.001	0.00008	0.002	No	23	0.00096	0.0001918	95.65	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1606	0.07285	0.05488	0.1	No	23	0.06386	0.01718	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1506	0.131	0.1	Yes	23	0.1408	0.0187	0	None	No	0.01	Param.
Selenium total (mg/L)	MW-1606	0.0002	0.00007	0.05	No	23	0.0001783	0.0001763	21.74	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1607	0.0002406	0.000119	0.05	No	23	0.000193	0.0001402	13.04	None	sqrt(x)	0.01	Param.
Thallium total (mg/L)	MW-1606	0.0002	0.00005	0.002	No	23	0.00014	0.00007764	60.87	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1607	0.0002	0.00005	0.002	No	23	0.0001513	0.00007701	69.57	None	No	0.01	NP (NDs)

Confidence Intervals - Dumps Fault - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 9/5/2023, 12:09 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Lower Compl.	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha Method
Cobalt total (mg/L)	MW-1610	0.008772	0.006382	0.006	n/a	Yes	23	0.007577	0.002284	0	None	No	0.01 Param.
Molybdenum total (mg/L)	MW-1610	0.1709	0.1196	0.1	n/a	Yes	23	0.1481	0.05395	0	None	sqrt(x)	0.01 Param.
Lithium total (mg/L)	MW-1610	0.201	0.161	0.161	n/a	Yes	23	0.184	0.0447	0	None	ln(x)	0.01 Param.

Confidence Intervals - Dumps Fault - All Results

Clinch River Client: AEP Data: Clinch River Printed 9/5/2023, 12:09 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Lower Compl.	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha Method
Antimony total (mg/L)	MW-1610	0.000221	0.00005961	0.006	n/a	No	23	0.00026	0.0004083	4.348	None	ln(x)	0.01 Param.
Arsenic total (mg/L)	MW-1610	0.00167	0.00118	0.04	n/a	No	23	0.00159	0.0009891	0	None	No	0.01 NP (normality)
Barium total (mg/L)	MW-1610	0.2708	0.2215	2	n/a	No	23	0.2461	0.04715	0	None	No	0.01 Param.
Beryllium total (mg/L)	MW-1610	0.00005	0.000007	0.004	n/a	No	23	0.00004213	0.00001755	82.61	None	No	0.01 NP (NDs)
Cadmium total (mg/L)	MW-1610	0.00001565	0.0000057080	0.005	n/a	No	23	0.00002178	0.00001221	34.78	Kaplan-Meier	sqrt(x)	0.01 Param.
Chromium total (mg/L)	MW-1610	0.000248	0.00018	0.1	n/a	No	23	0.000243	0.0001409	0	None	No	0.01 NP (normality)
Cobalt total (mg/L)	MW-1610	0.008772	0.006382	0.006	n/a	Yes	23	0.007577	0.002284	0	None	No	0.01 Param.
Combined Radium 226 and 228 (pCi/L)	MW-1610	1.508	0.8429	5	n/a	No	23	1.176	0.6362	0	None	No	0.01 Param.
Molybdenum total (mg/L)	MW-1610	0.1709	0.1196	0.1	n/a	Yes	23	0.1481	0.05395	0	None	sqrt(x)	0.01 Param.
Selenium total (mg/L)	MW-1610	0.000336	0.0001988	0.05	n/a	No	23	0.0002674	0.0001312	8.696	None	No	0.01 Param.
Thallium total (mg/L)	MW-1610	0.0002	0.00003	0.002	n/a	No	23	0.000153	0.00008087	73.91	None	No	0.01 NP (NDs)
Fluoride total (mg/L)	MW-1610	0.22	0.18	4	n/a	No	23	0.2074	0.03899	0	None	No	0.01 NP (normality)
Lead total (mg/L)	MW-1610	0.007041	0.002694	0.015	n/a	No	23	0.005507	0.004557	0	None	sqrt(x)	0.01 Param.
Lithium total (mg/L)	MW-1610	0.201	0.161	0.161	n/a	Yes	23	0.184	0.0447	0	None	ln(x)	0.01 Param.
Mercury total (mg/L)	MW-1610	0.001	0.00006	0.002	n/a	No	23	0.0009591	0.000196	95.65	None	No	0.01 NP (NDs)

Appendix IV Trend Tests - Chattanooga Shale - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:44 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Barium total (mg/L)	MW-1601 (bg)	-0.02599	-175	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1602 (bg)	-0.002596	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1603	0.1938	125	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1605	0.2227	111	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1608 (bg)	-0.003546	-207	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1612	0.1014	89	71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1602 (bg)	-0.001427	-91	-76	Yes	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1608 (bg)	-0.001146	-126	-76	Yes	23	4.348	n/a	n/a	0.05	NP

Appendix IV Trend Tests - Chattanooga Shale - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:44 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Barium total (mg/L)	MW-1601 (bg)	-0.02599	-175	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1602 (bg)	-0.002596	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1603	0.1938	125	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1604	-0.005062	-10	-76	No	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1605	0.2227	111	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1608 (bg)	-0.003546	-207	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1612	0.1014	89	71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1601 (bg)	-0.001042	-50	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1602 (bg)	-0.001427	-91	-76	Yes	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1605	-0.001563	-42	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1608 (bg)	-0.001146	-126	-76	Yes	23	4.348	n/a	n/a	0.05	NP

Appendix IV Trend Tests - Rome Limestone - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:35 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Lithium total (mg/L)	MW-1609 (bg)	-0.00105	-126	-76	Yes	23	26.09	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1609 (bg)	-0.0001288	-113	-76	Yes	23	21.74	n/a	n/a	0.05	NP

Appendix IV Trend Tests - Rome Limestone - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:35 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1607	-0.0002417	-46	-76	No	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1609 (bg)	-0.00003149	-59	-76	No	23	13.04	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1606	-0.0008913	-11	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1607	0.0006326	28	76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1609 (bg)	-0.00105	-126	-76	Yes	23	26.09	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1607	-0.004568	-67	-76	No	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1609 (bg)	-0.0001288	-113	-76	Yes	23	21.74	n/a	n/a	0.05	NP

Appendix IV Trend Tests - Dumps Fault - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:52 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1610	-0.001134	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.00001662	-198	-71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1611 (bg)	-0.009376	-181	-76	Yes	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1611 (bg)	-0.0001732	-100	-71	Yes	22	0	n/a	n/a	0.05	NP

Appendix IV Trend Tests - Dumps Fault - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:52 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1610	-0.001134	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.0001662	-198	-71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1610	-0.003519	-27	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1611 (bg)	-0.009376	-181	-76	Yes	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1610	-0.00943	-56	-76	No	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1611 (bg)	-0.0001732	-100	-71	Yes	22	0	n/a	n/a	0.05	NP

Confidence Interval (Most Recent 8) - Chattanooga Shale - Barium MW-1605

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:42 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium total (mg/L)	MW-1605	2.468	2.169	2	Yes	8	2.319	0.1412	0	None	No	0.01	Param.

Confidence Interval (Most Recent 8) - Dumps Fault - All Results (No Significant)

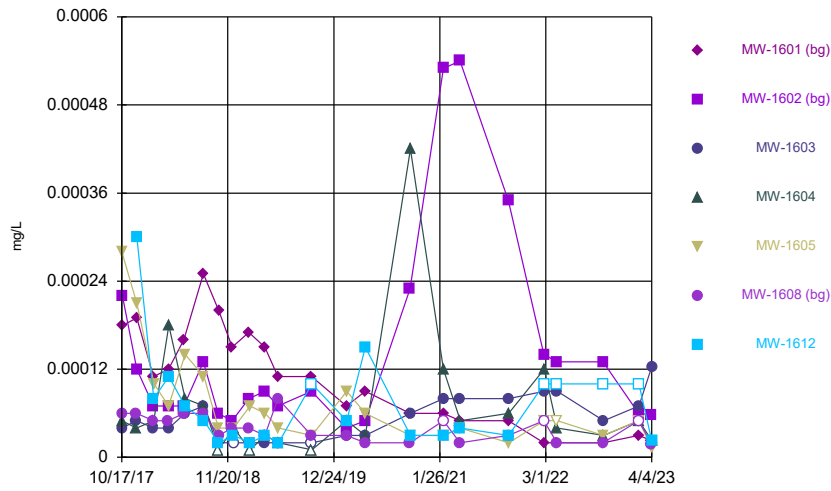
Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:49 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt total (mg/L)	MW-1610	0.006695	0.004797	0.006	No	8	0.005746	0.0008952	0	None	No	0.01	Param.

FIGURE A.

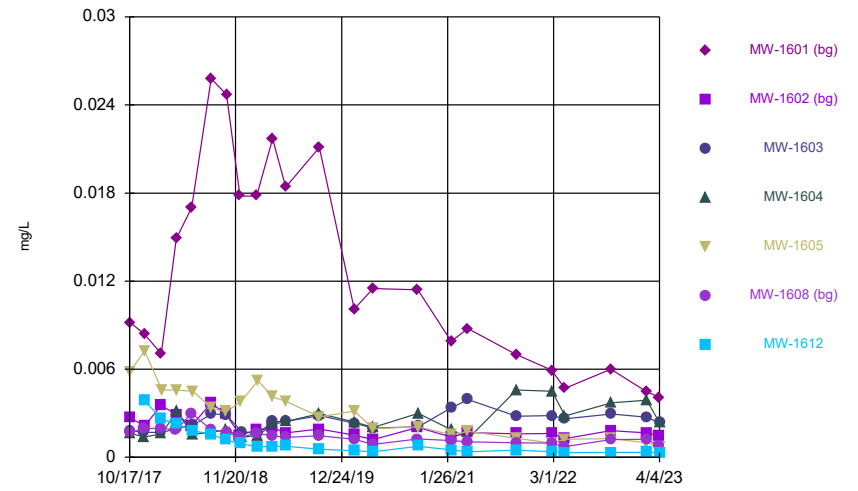
Time Series - Chattanooga Shale

Time Series



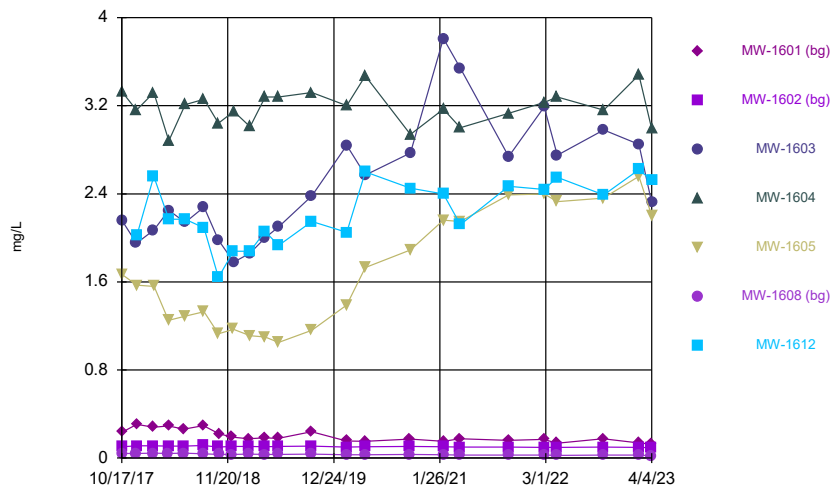
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Clinch River Client: AEP Data: Clinch River

Time Series



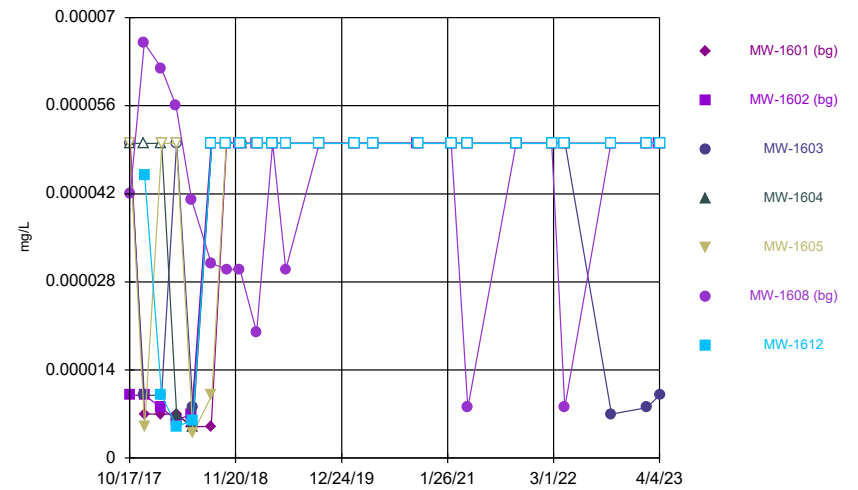
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Clinch River Client: AEP Data: Clinch River

Time Series



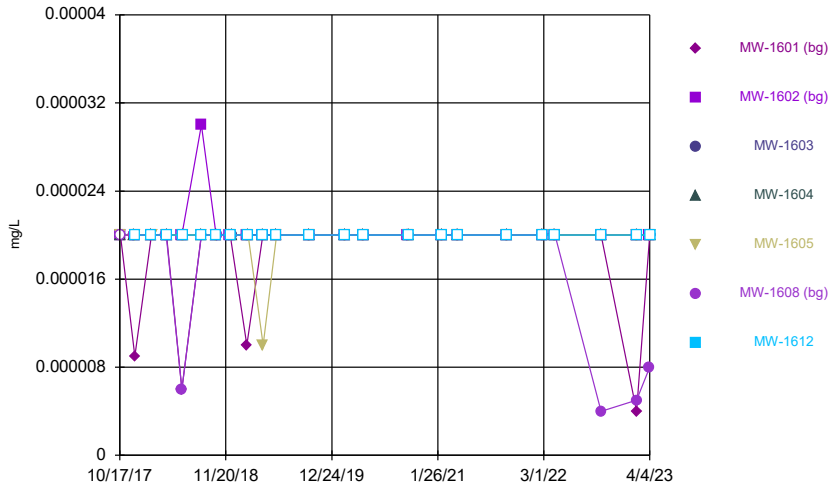
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Clinch River Client: AEP Data: Clinch River

Time Series



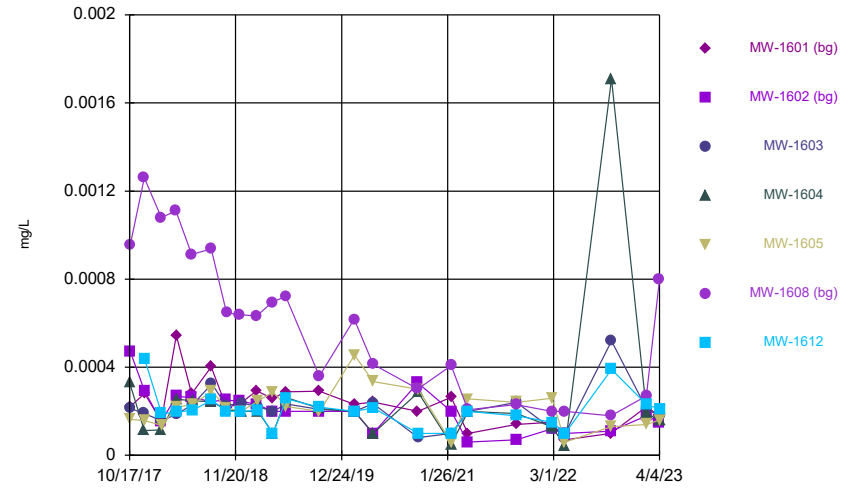
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Clinch River Client: AEP Data: Clinch River

Time Series



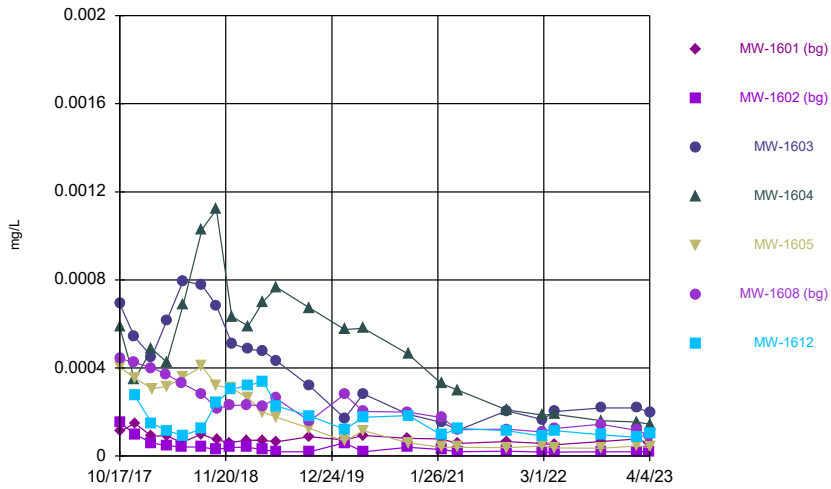
Constituent: Cadmium total Analysis Run 6/22/2023 2:52 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



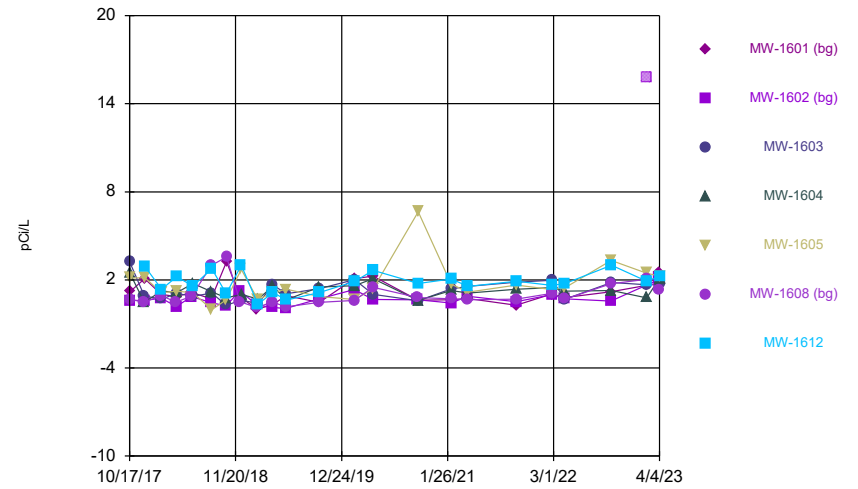
Constituent: Chromium total Analysis Run 6/22/2023 2:52 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



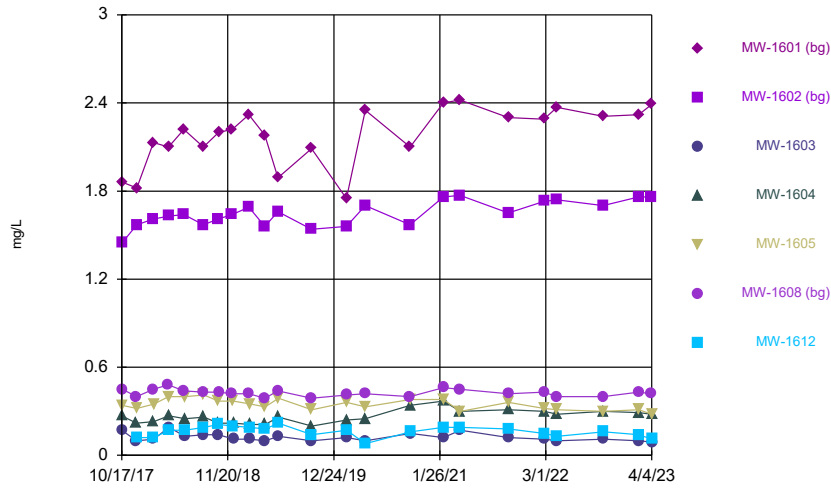
Constituent: Cobalt total Analysis Run 6/22/2023 2:52 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series

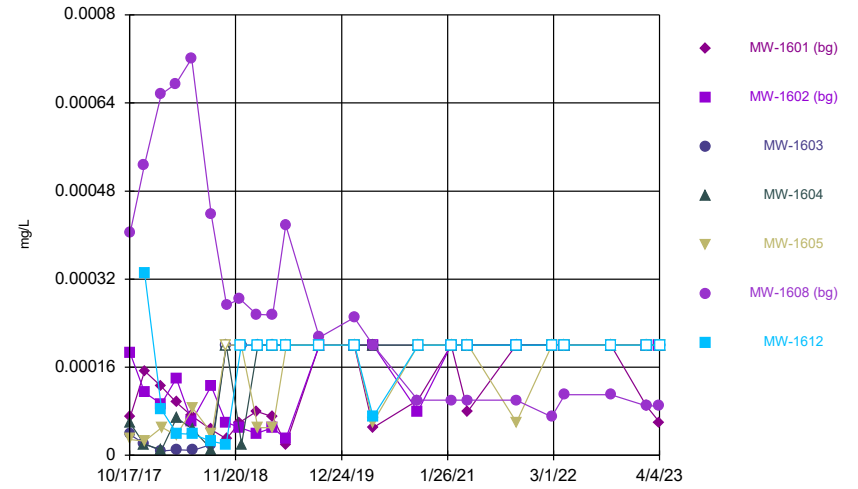


Constituent: Combined Radium 226 and 228 Analysis Run 6/22/2023 2:52 PM View: Chattanooga Shale -
Clinch River Client: AEP Data: Clinch River

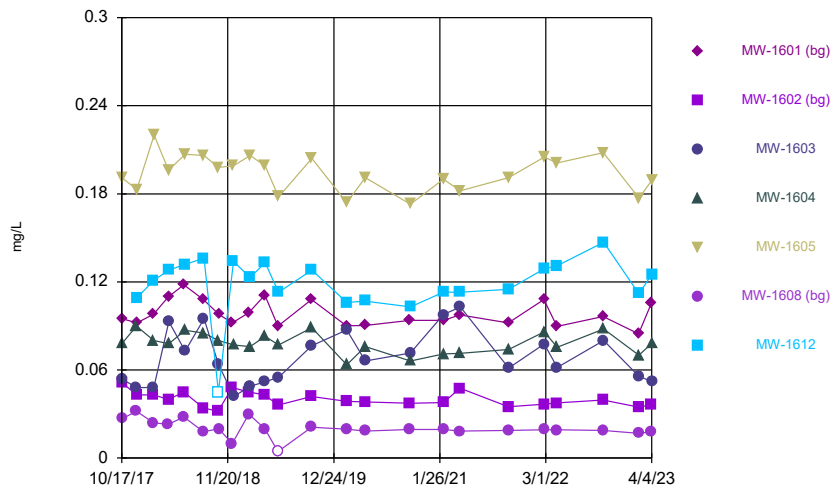
Time Series



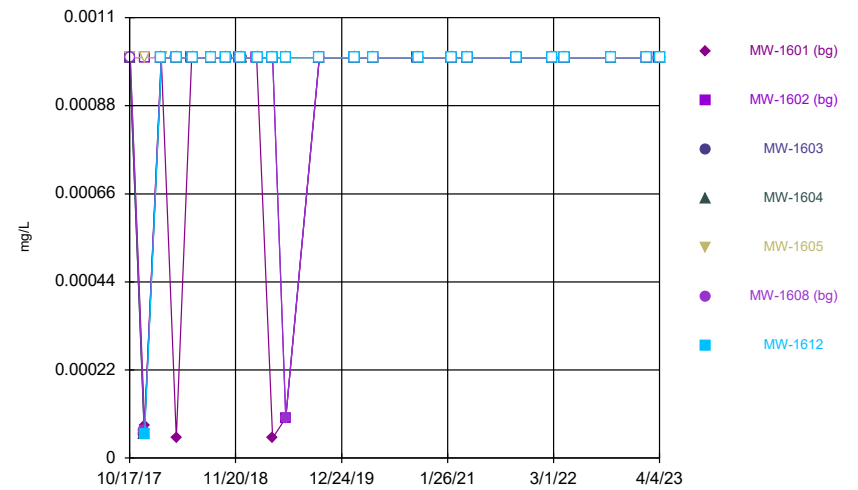
Time Series



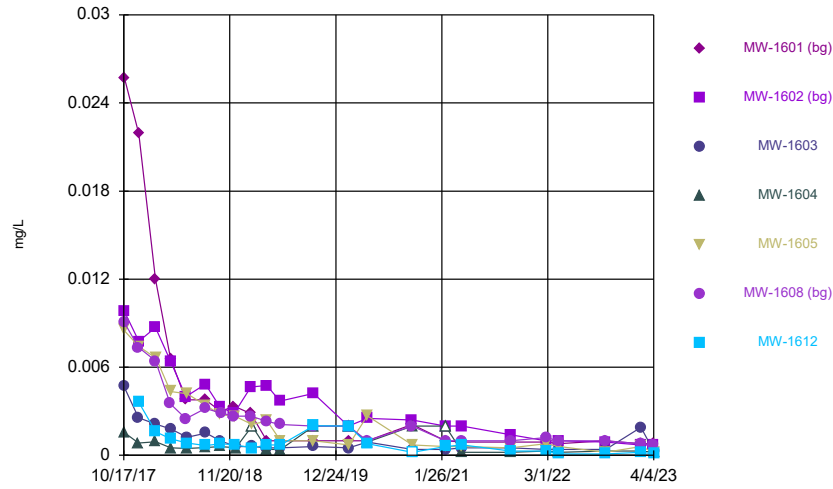
Time Series



Time Series

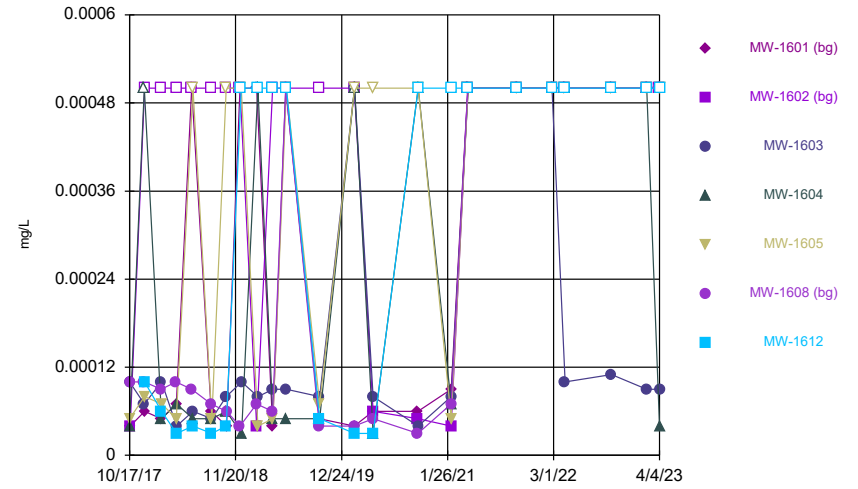


Time Series



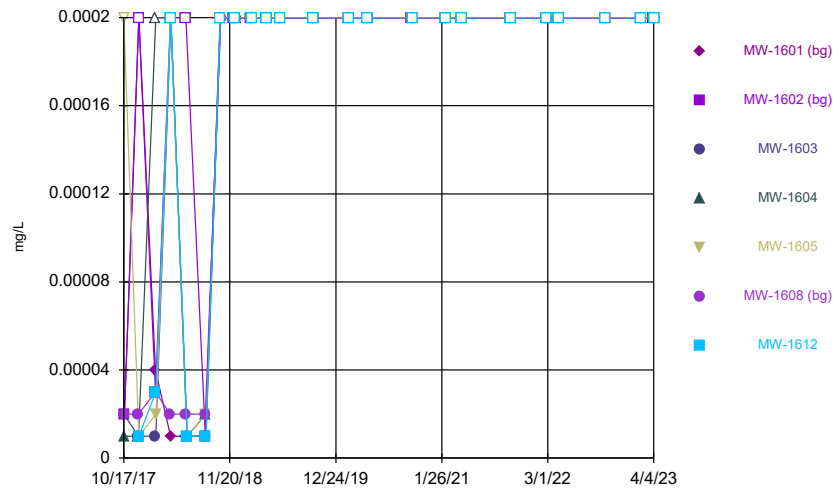
Constituent: Molybdenum total Analysis Run 6/22/2023 2:52 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



Constituent: Selenium total Analysis Run 6/22/2023 2:52 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

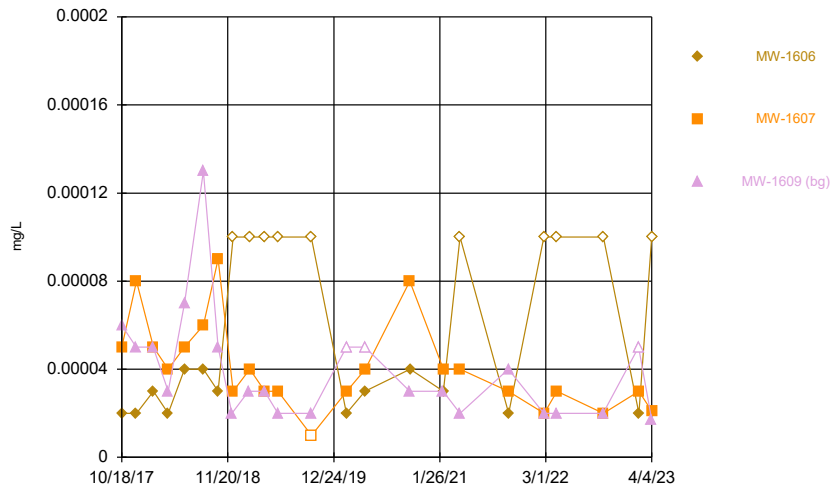
Time Series



Constituent: Thallium total Analysis Run 6/22/2023 2:52 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

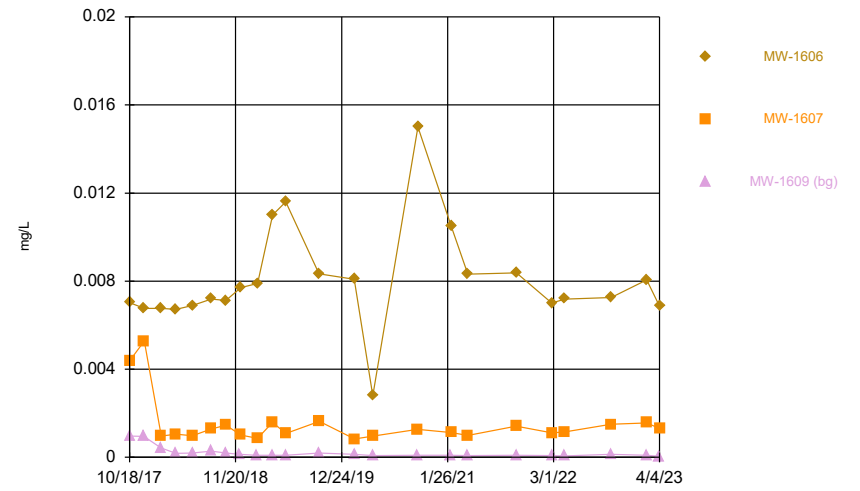
Time Series - Rome Limestone

Time Series



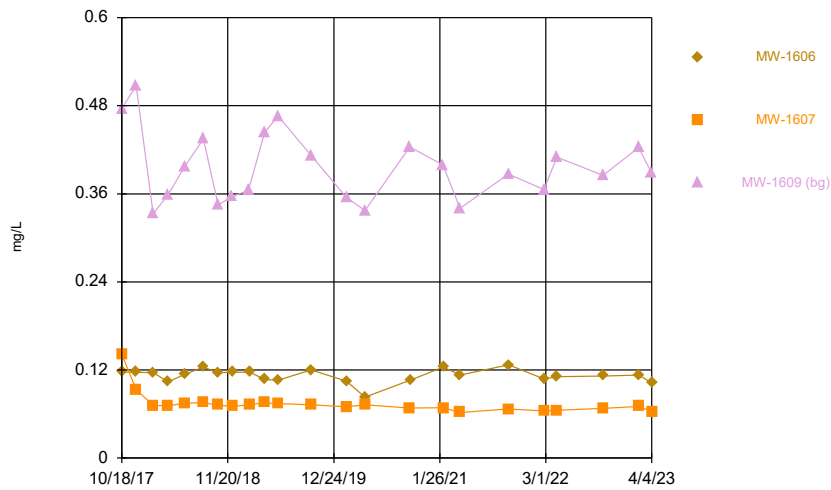
Constituent: Antimony total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



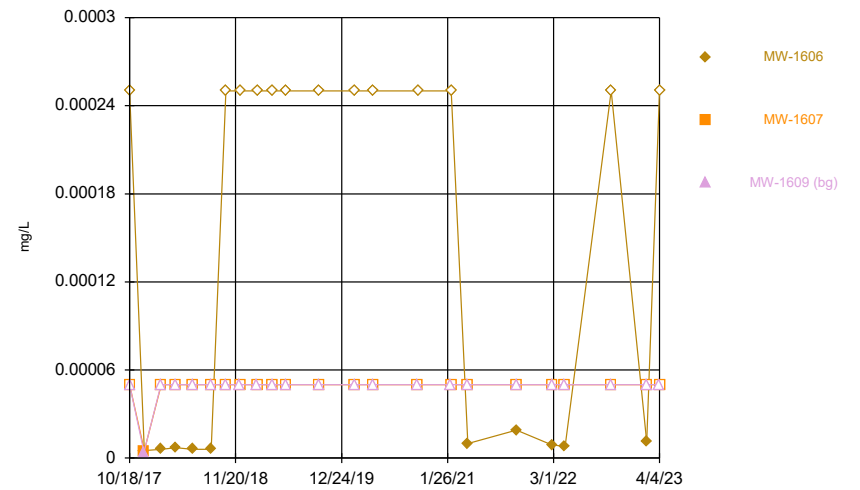
Constituent: Arsenic total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



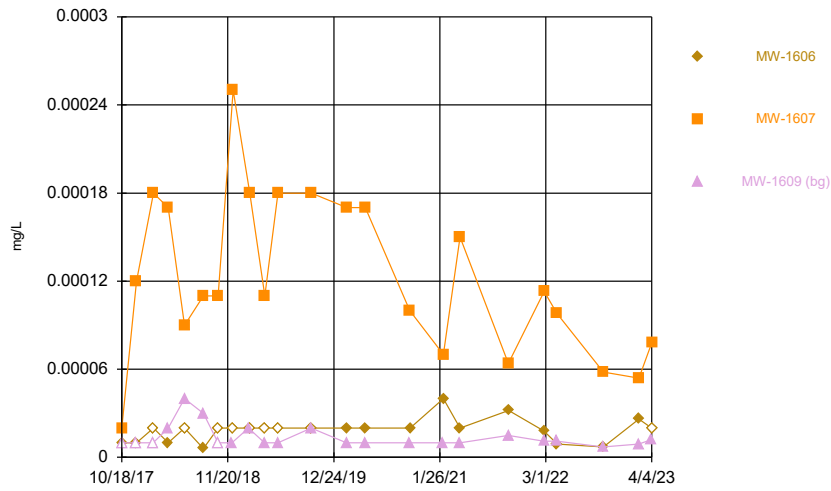
Constituent: Barium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



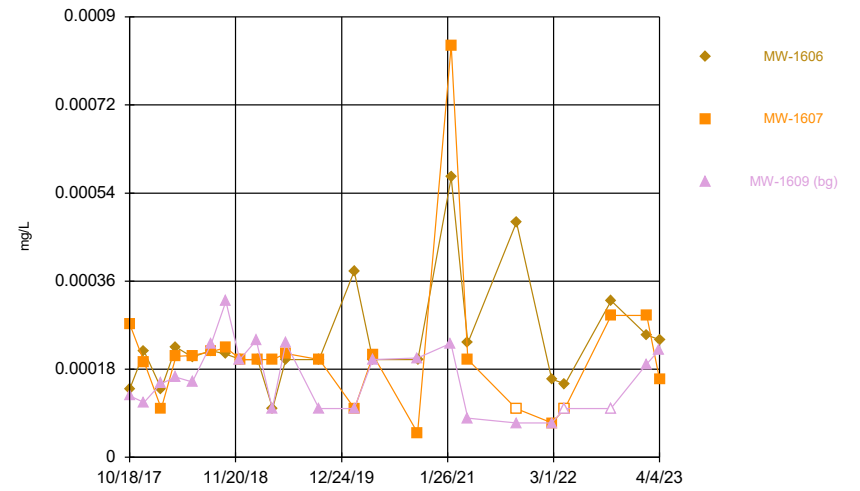
Constituent: Beryllium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



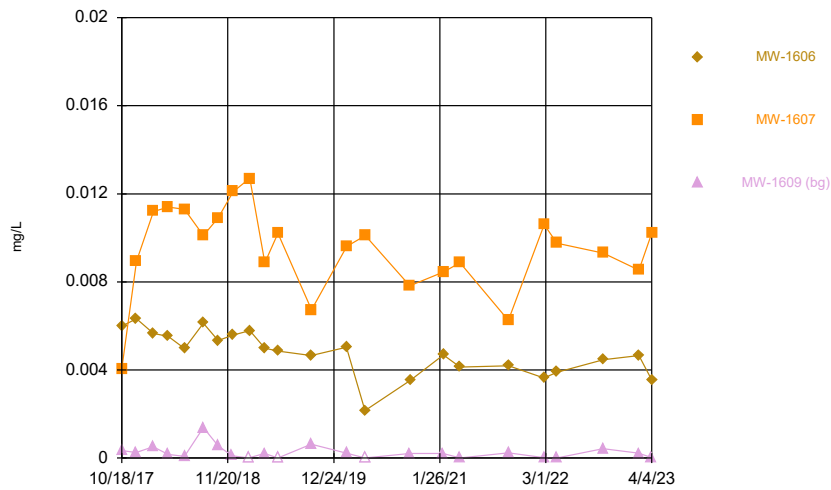
Constituent: Cadmium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



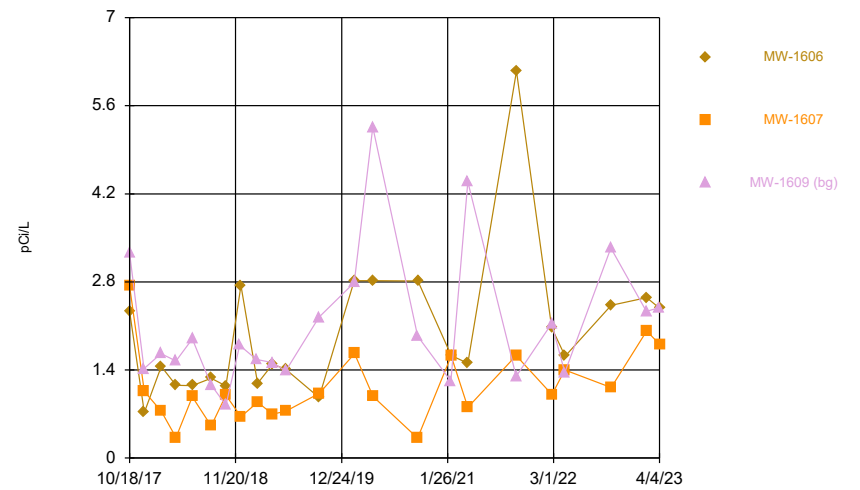
Constituent: Chromium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



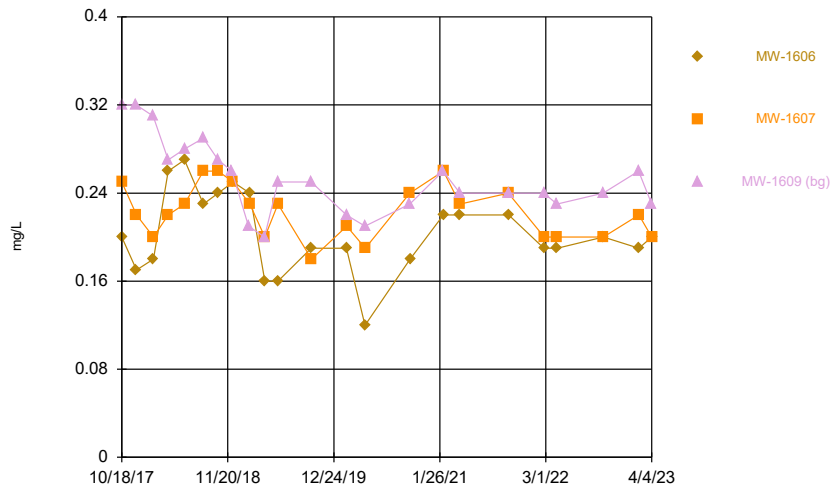
Constituent: Cobalt total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



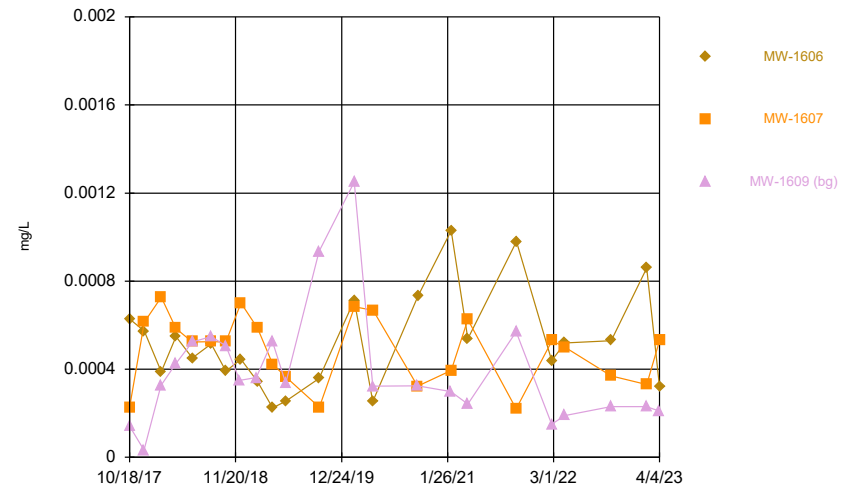
Constituent: Combined Radium 226 and 228 Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - P
Clinch River Client: AEP Data: Clinch River

Time Series



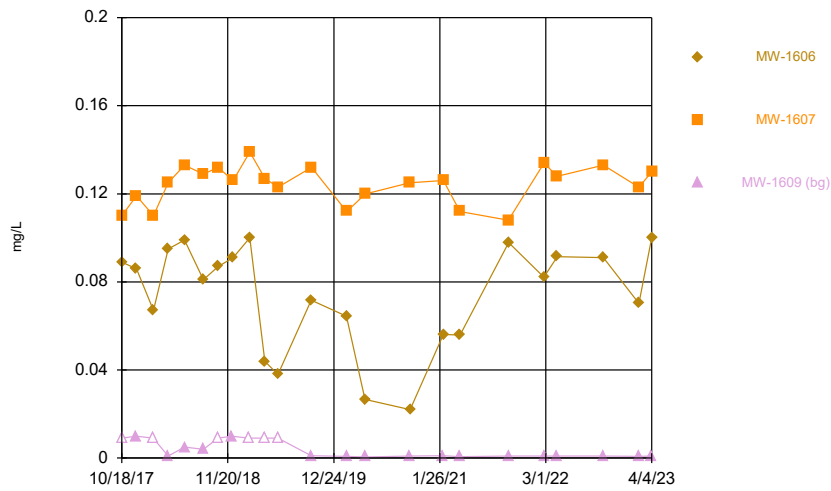
Constituent: Fluoride total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



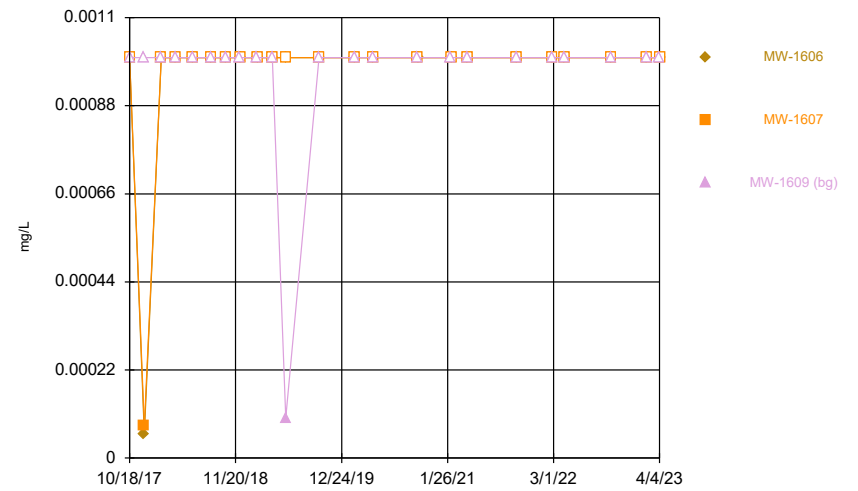
Constituent: Lead total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



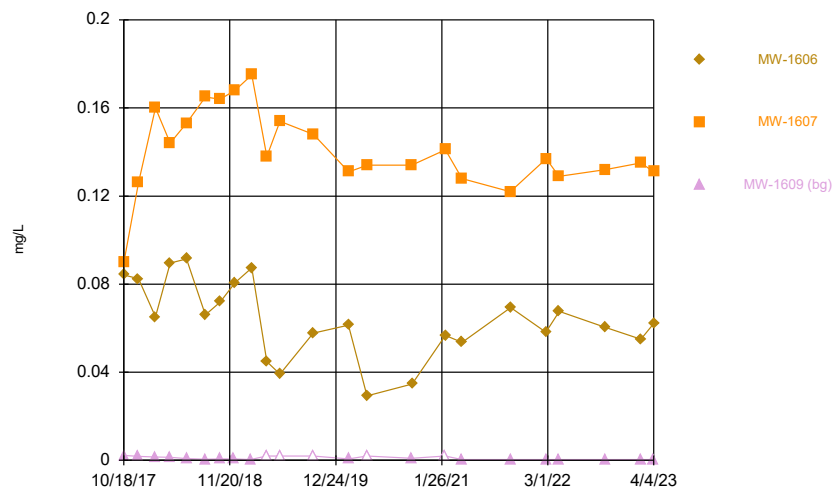
Constituent: Lithium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



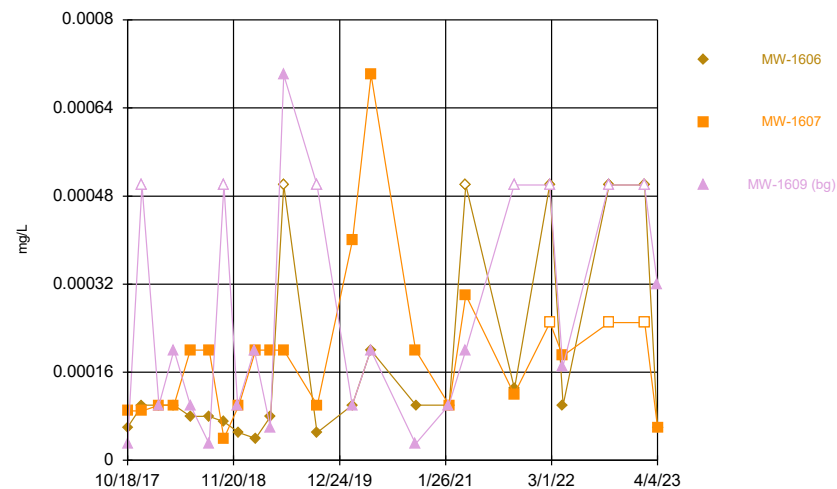
Constituent: Mercury total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



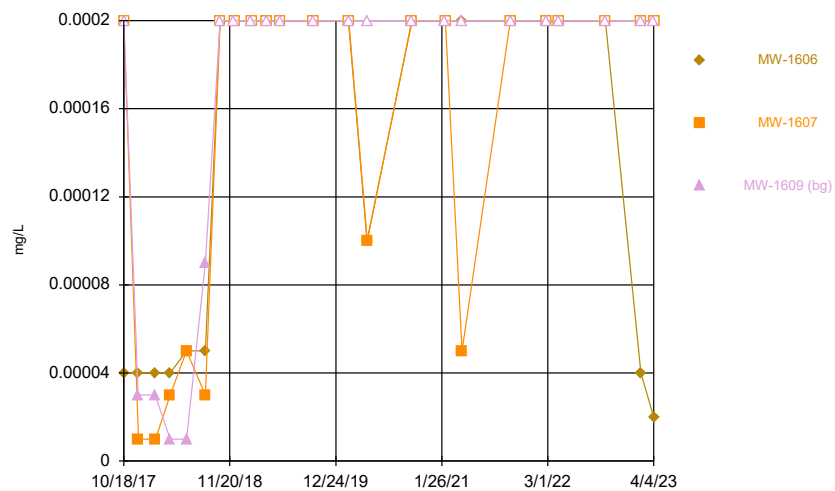
Constituent: Molybdenum total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



Constituent: Selenium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

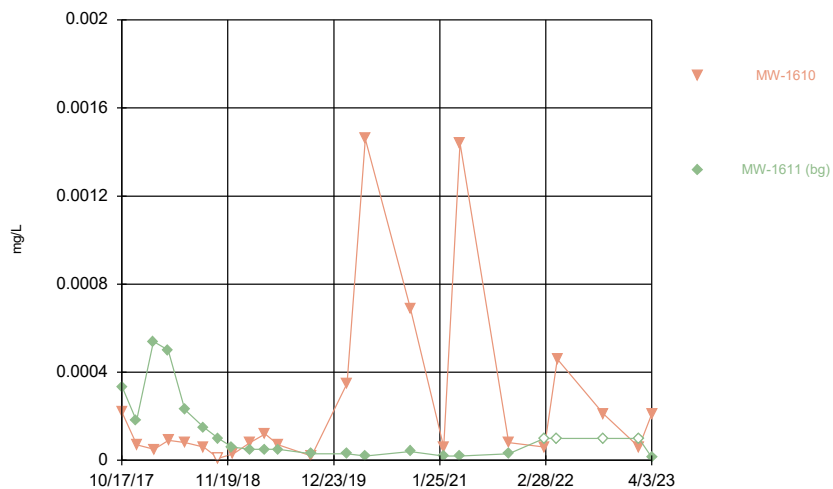
Time Series



Constituent: Thallium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

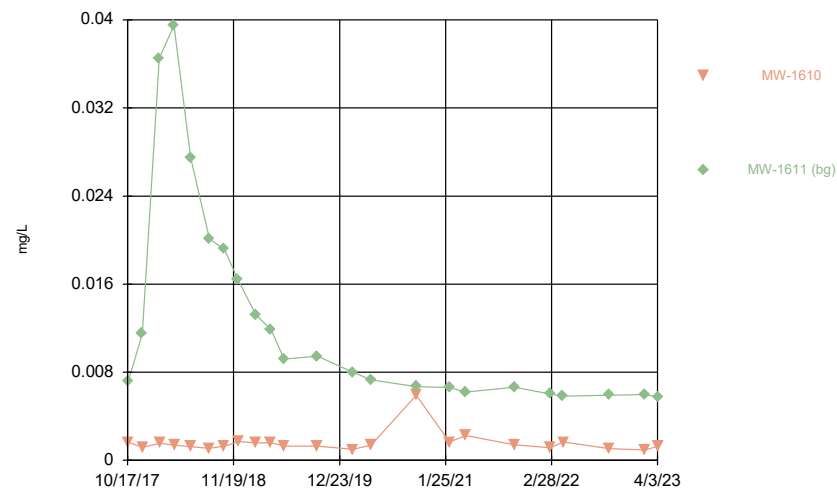
Time Series - Dumps Fault

Time Series



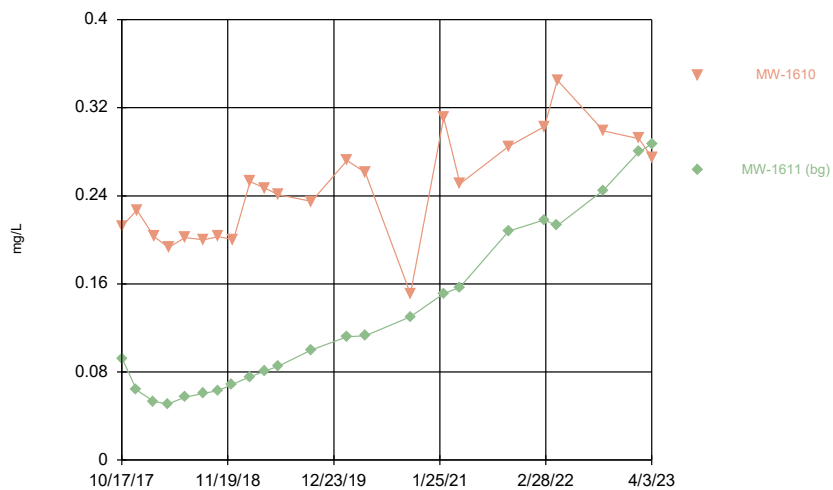
Constituent: Antimony total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



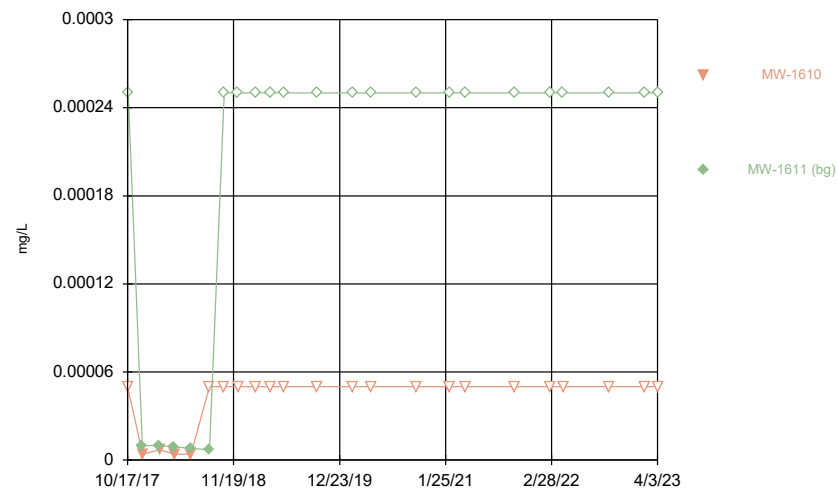
Constituent: Arsenic total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



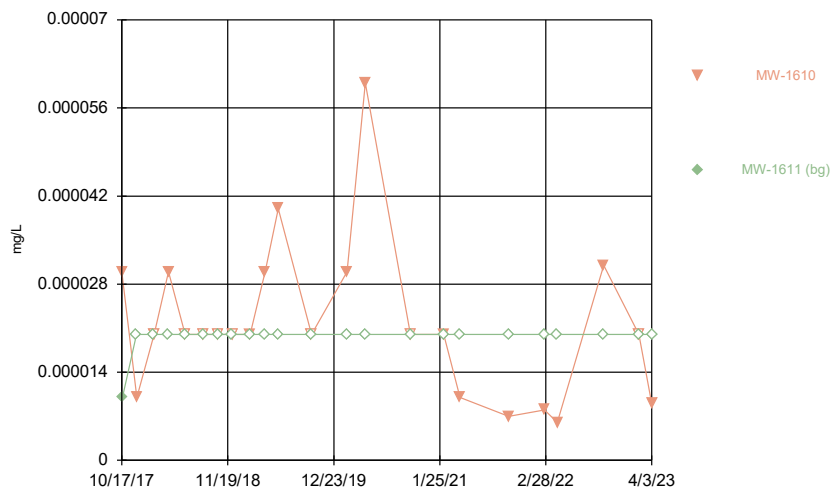
Constituent: Barium total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



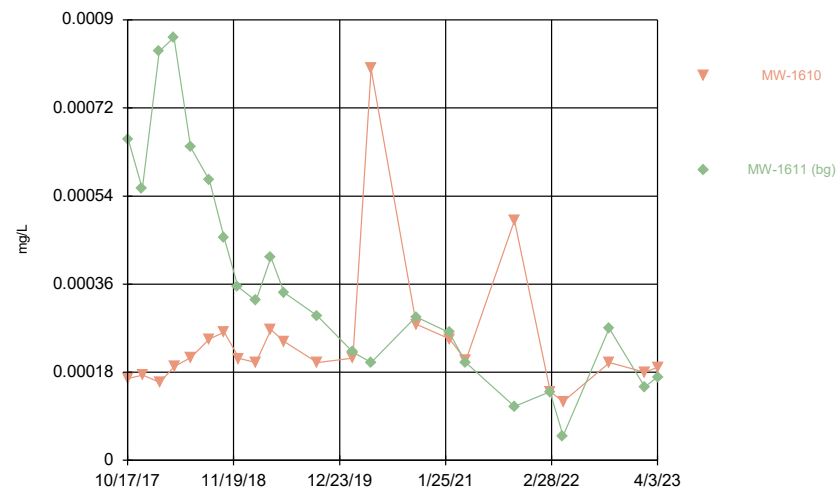
Constituent: Beryllium total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



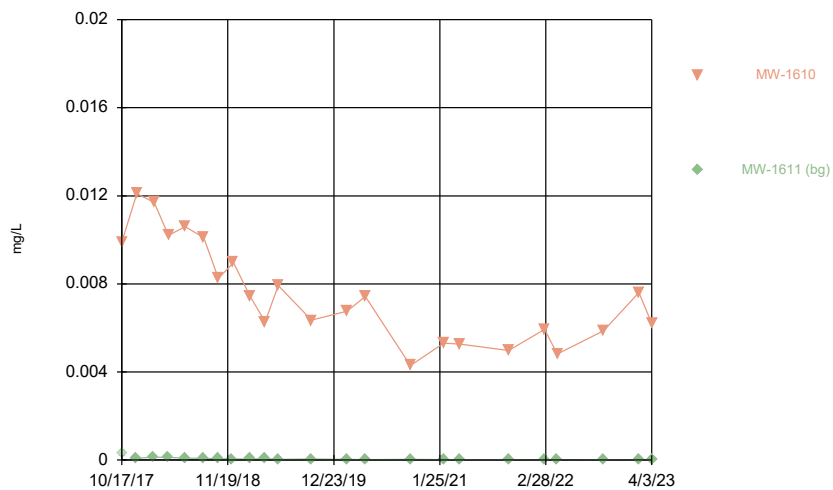
Constituent: Cadmium total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
 Clinch River Client: AEP Data: Clinch River

Time Series



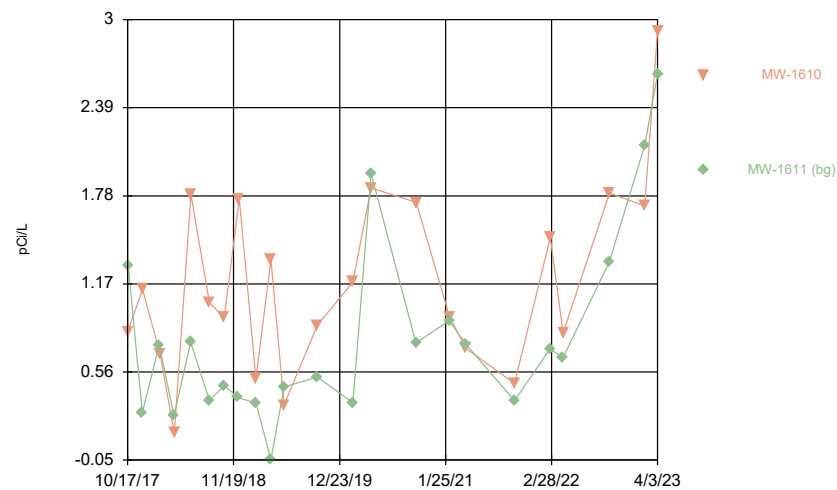
Constituent: Chromium total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
 Clinch River Client: AEP Data: Clinch River

Time Series



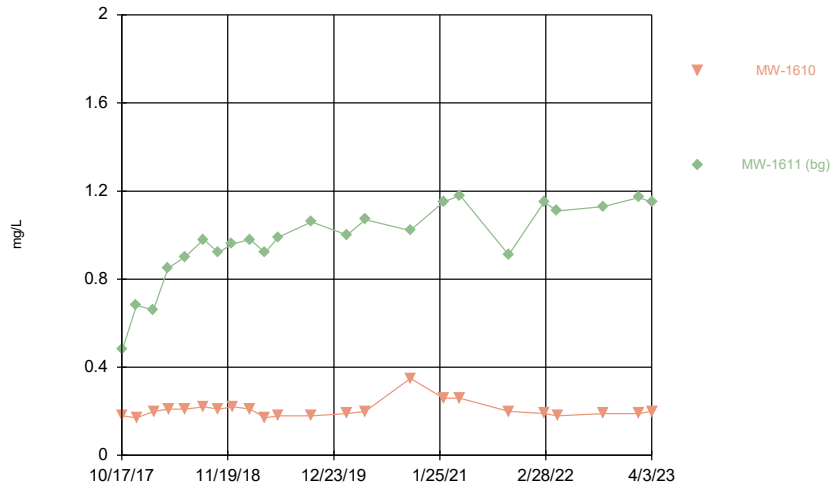
Constituent: Cobalt total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
 Clinch River Client: AEP Data: Clinch River

Time Series



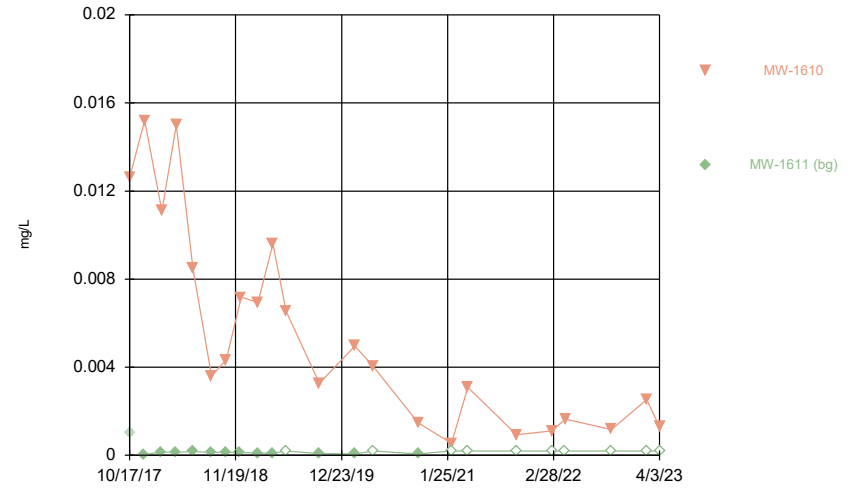
Constituent: Combined Radium 226 and 228 Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
 Clinch River Client: AEP Data: Clinch River

Time Series



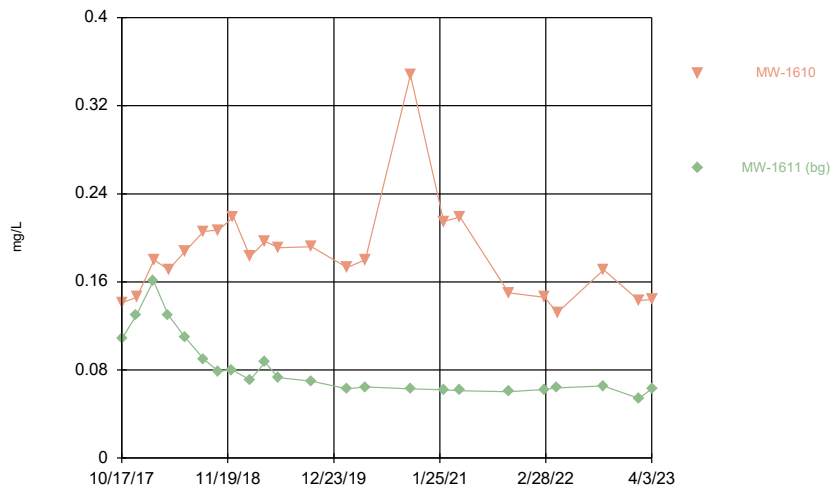
Constituent: Fluoride total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



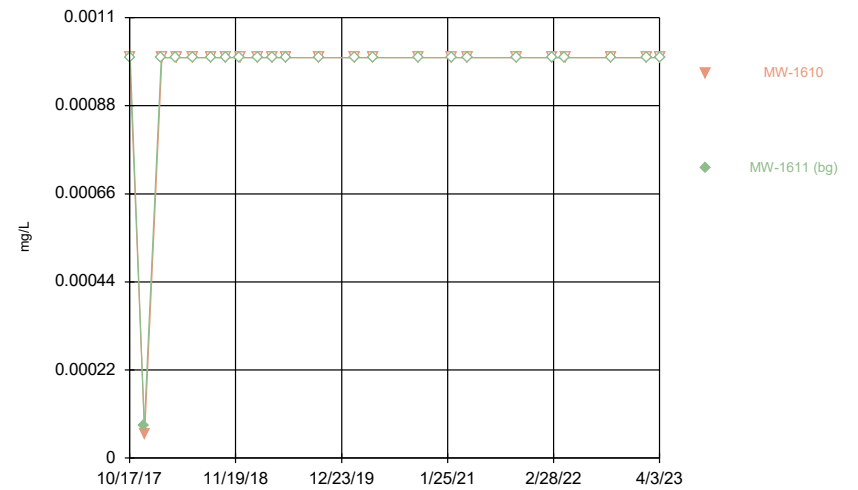
Constituent: Lead total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



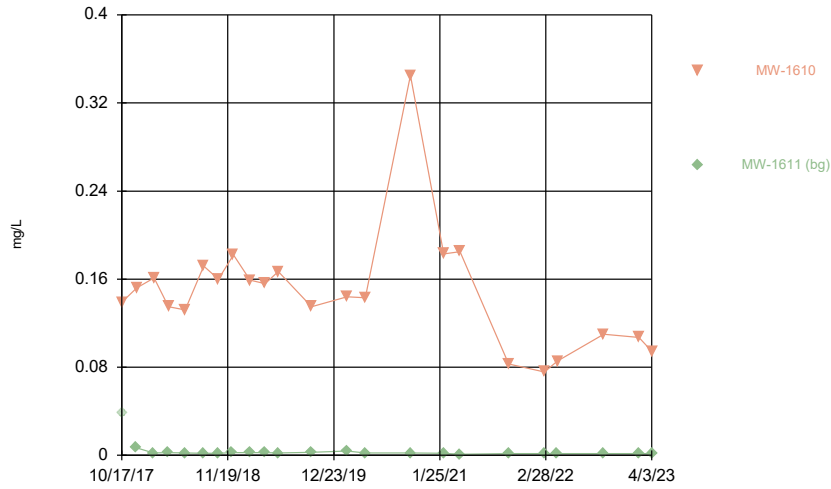
Constituent: Lithium total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Time Series



Constituent: Mercury total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

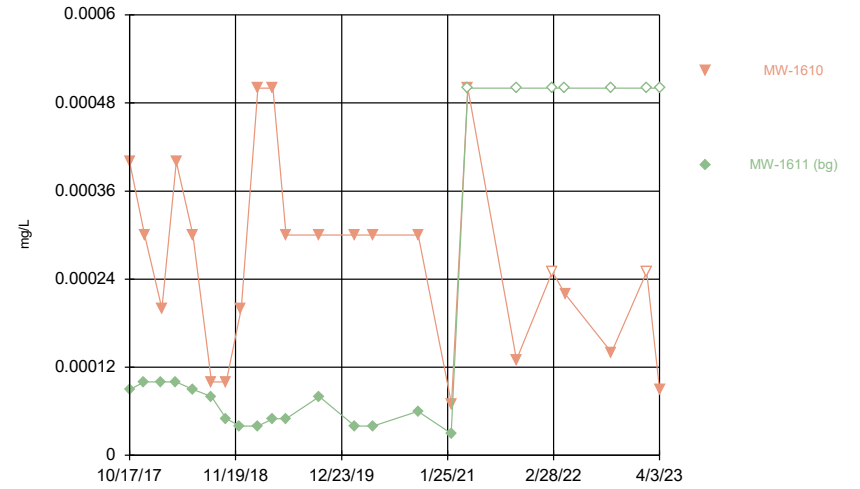
Time Series



Constituent: Molybdenum total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

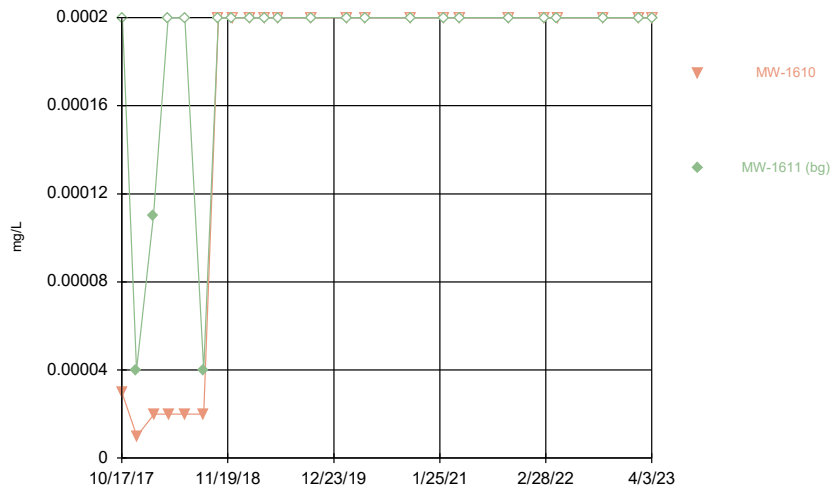
Time Series



Constituent: Selenium total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

Time Series

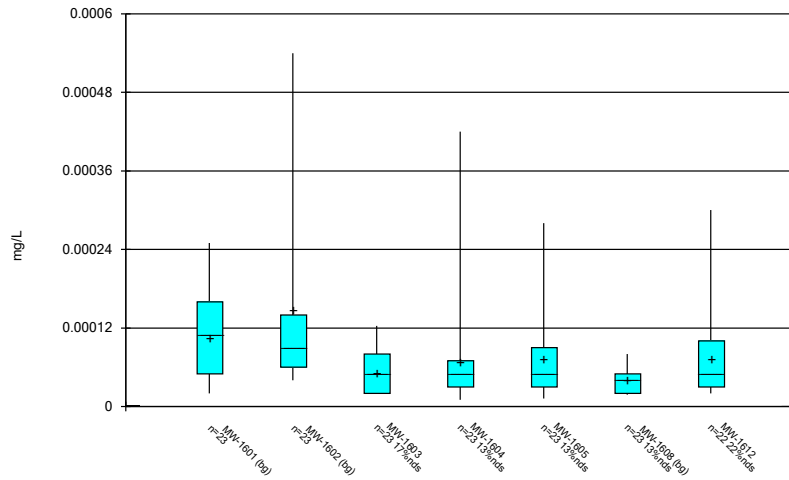


Constituent: Thallium total Analysis Run 6/23/2023 10:36 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

FIGURE B.

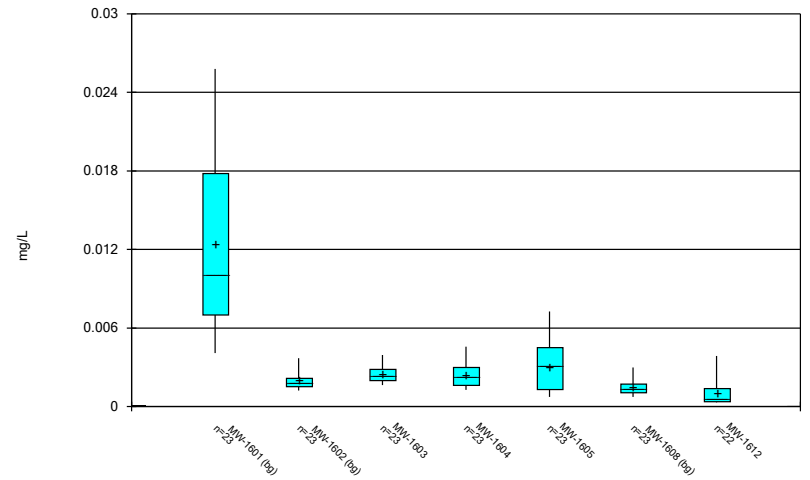
Box Plots - Chattanooga Shale

Box & Whiskers Plot



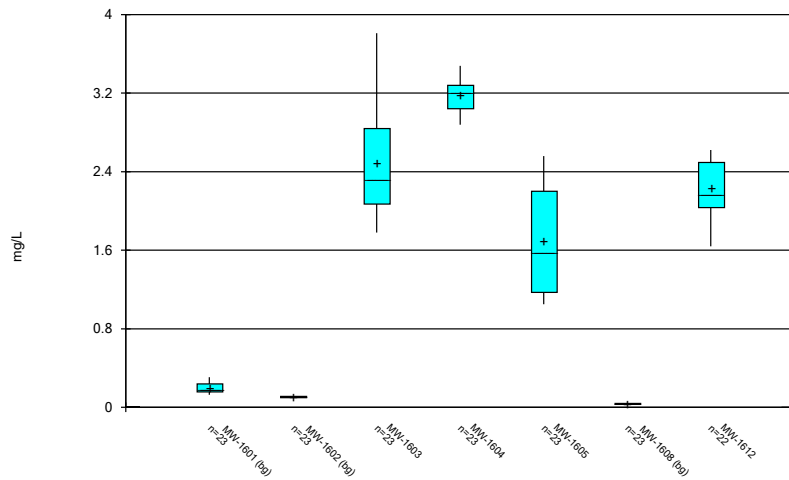
Constituent: Antimony total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



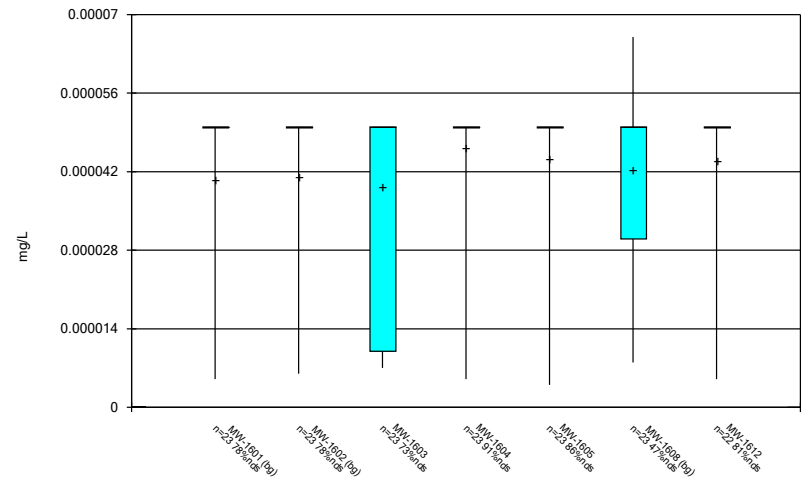
Constituent: Arsenic total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



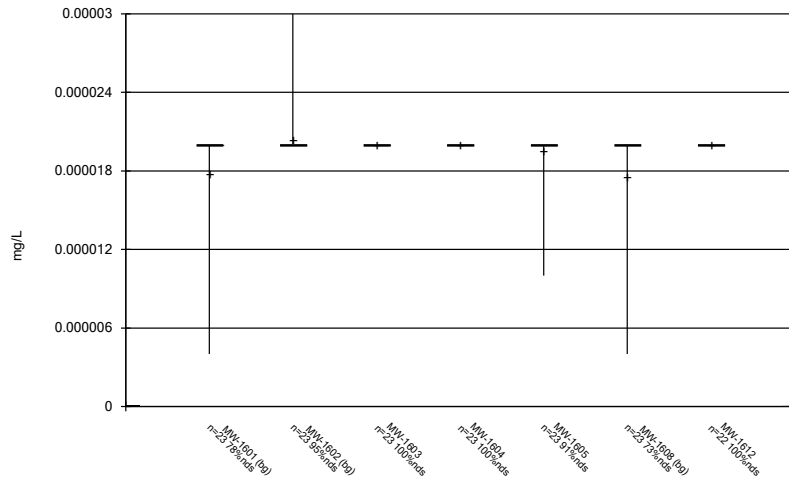
Constituent: Barium total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



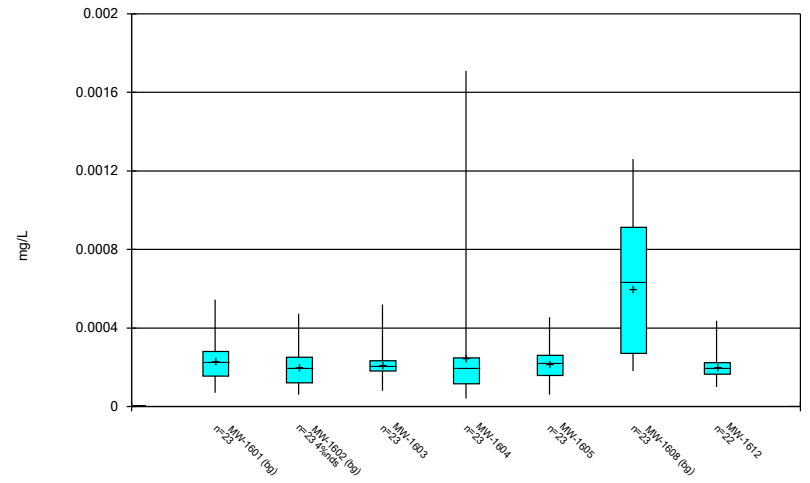
Constituent: Beryllium total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



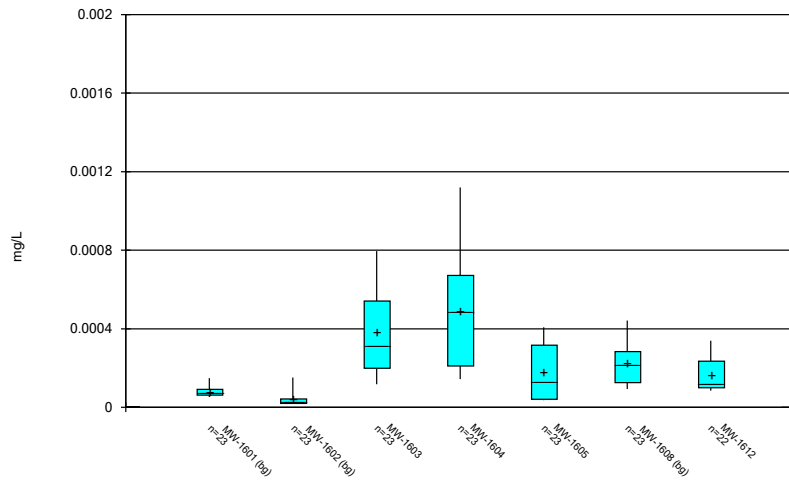
Constituent: Cadmium total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



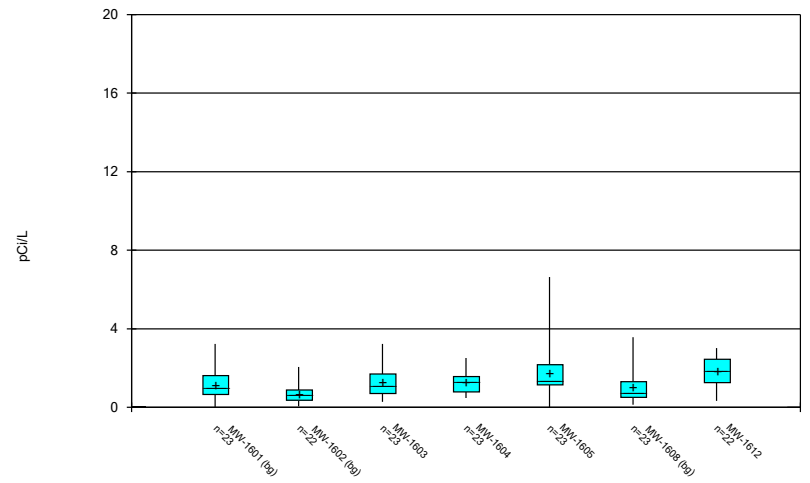
Constituent: Chromium total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



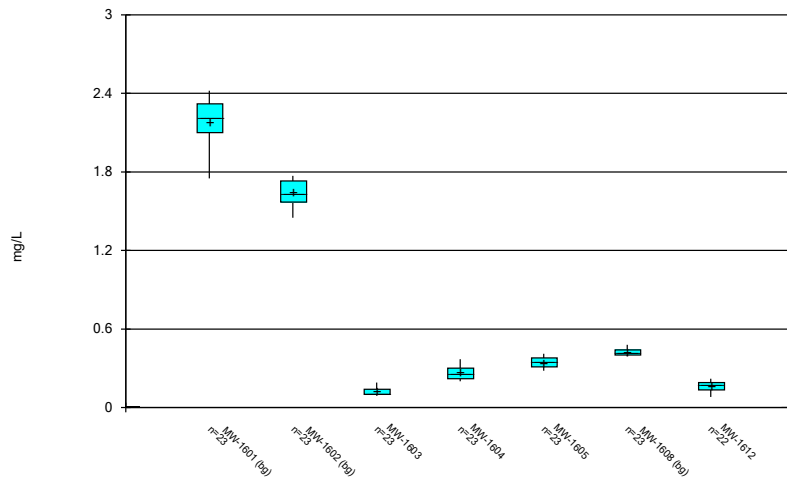
Constituent: Cobalt total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



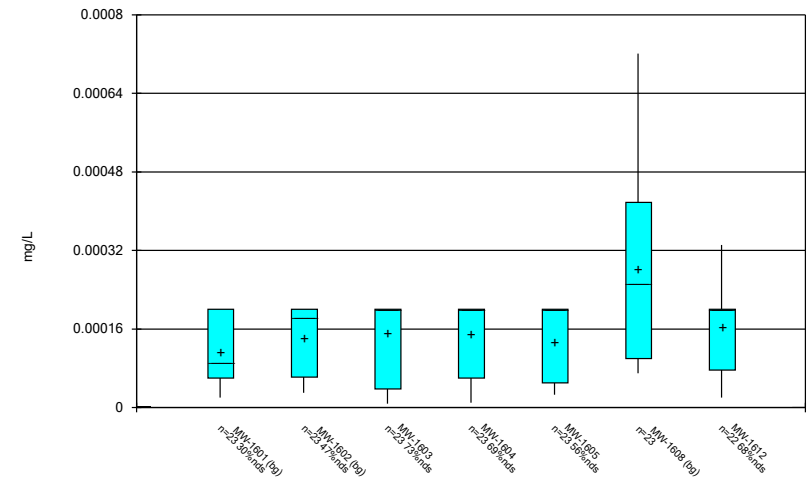
Constituent: Combined Radium 226 and 228 Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale -
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



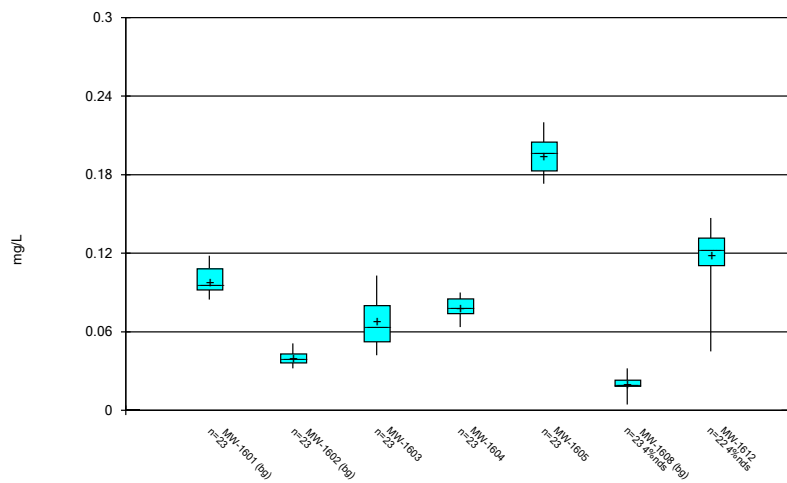
Constituent: Fluoride total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



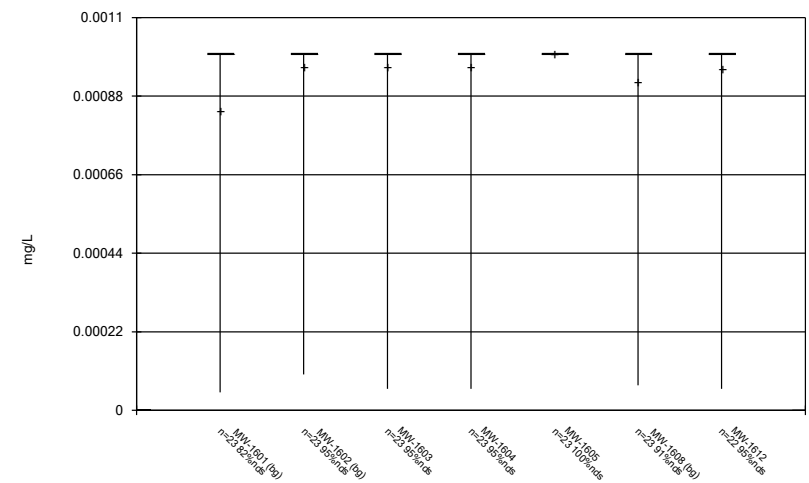
Constituent: Lead total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



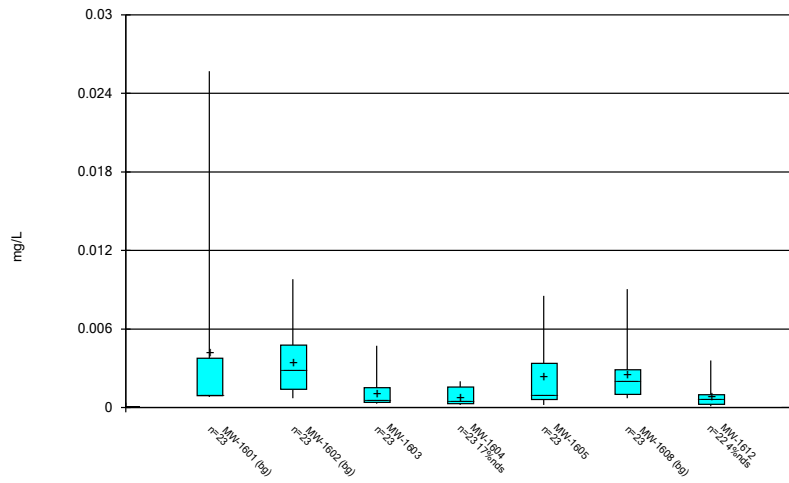
Constituent: Lithium total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



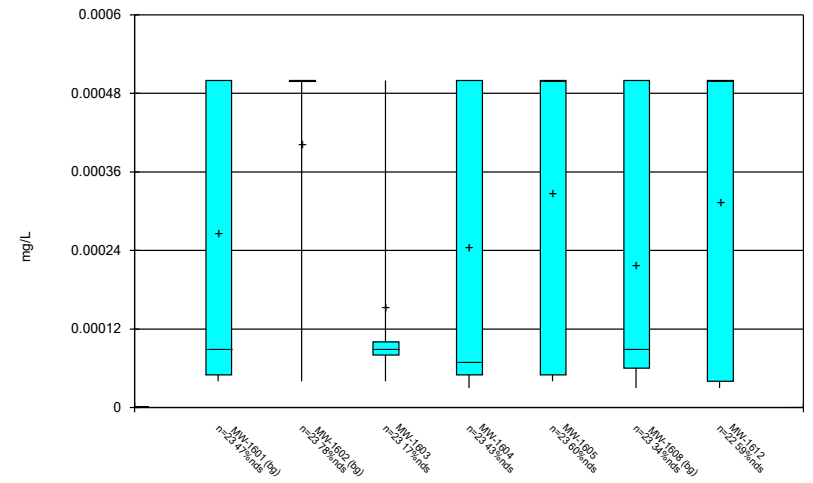
Constituent: Mercury total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



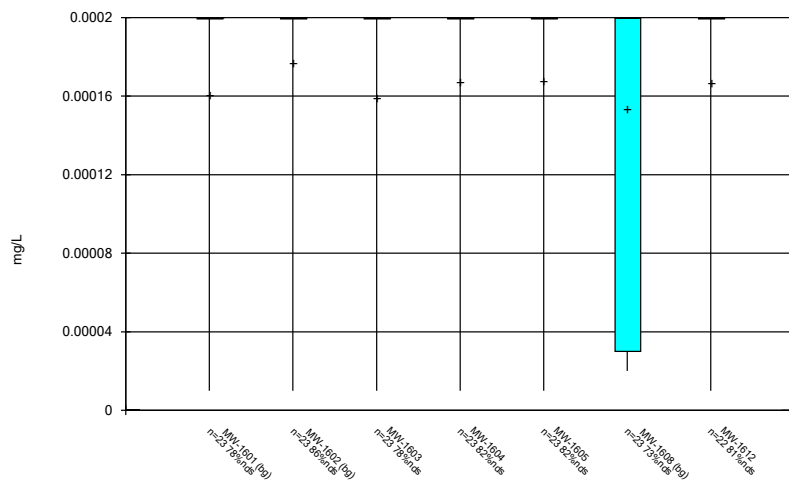
Constituent: Molybdenum total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Selenium total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

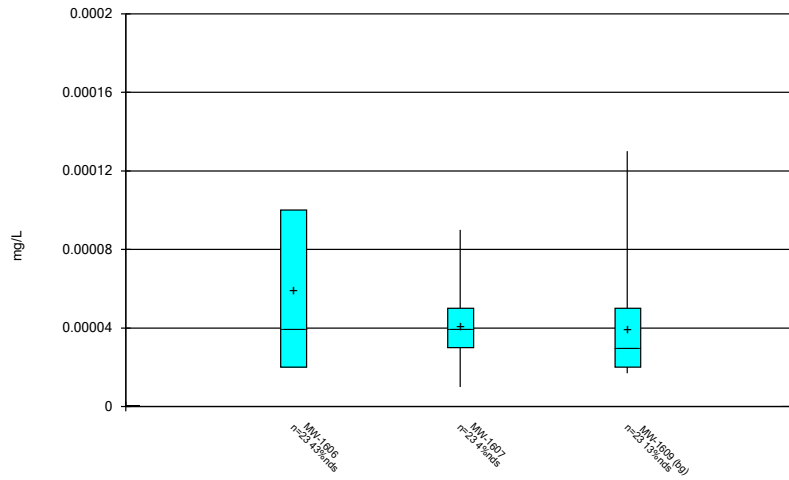
Box & Whiskers Plot



Constituent: Thallium total Analysis Run 6/22/2023 2:53 PM View: Chattanooga Shale - Pond 1
Clinch River Client: AEP Data: Clinch River

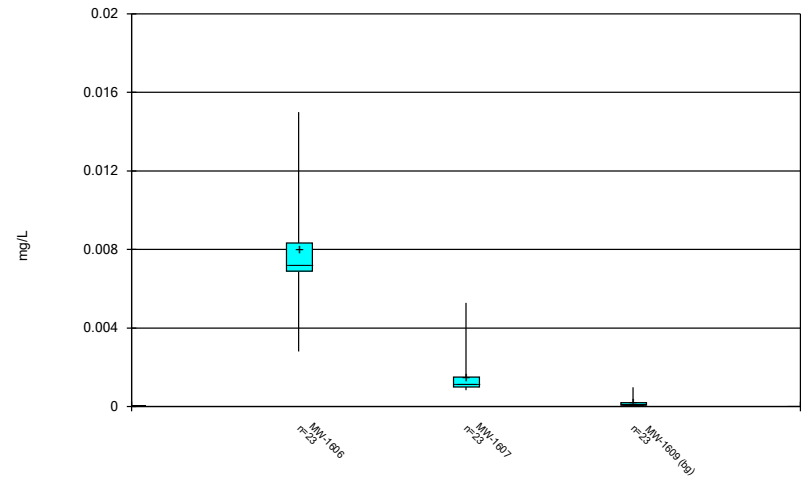
Box Plots - Rome Limestone

Box & Whiskers Plot



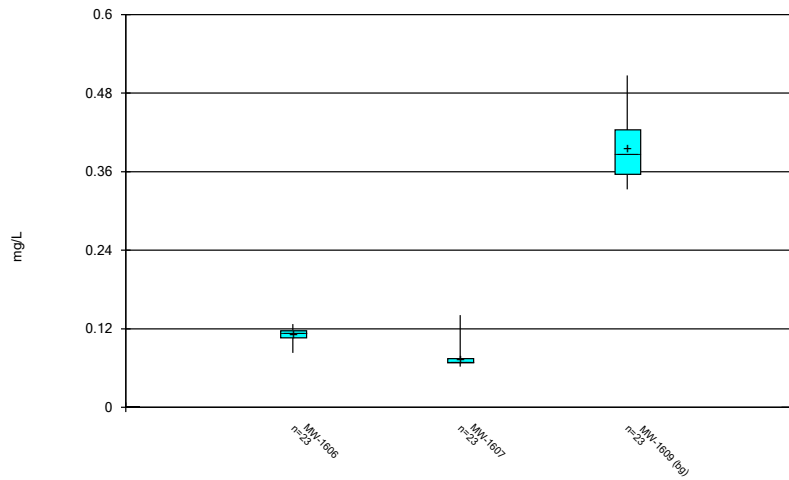
Constituent: Antimony total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



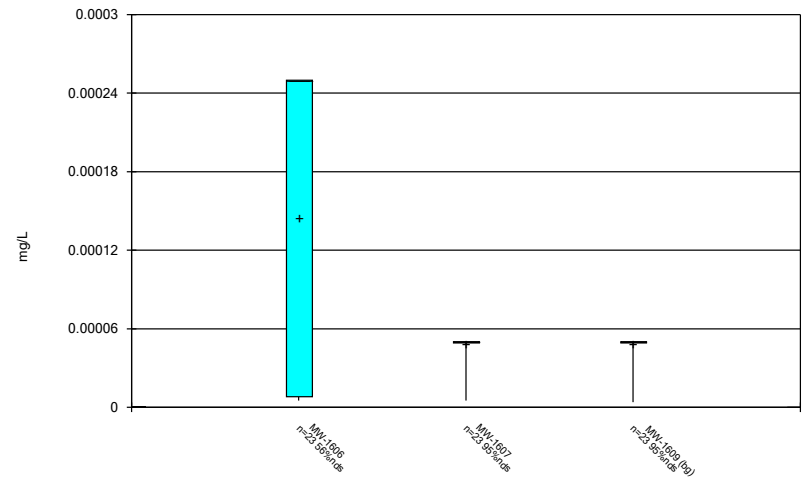
Constituent: Arsenic total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



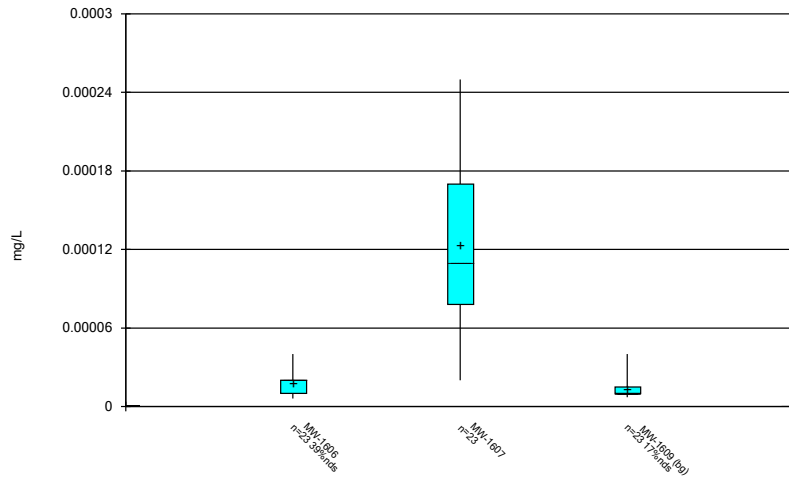
Constituent: Barium total Analysis Run 6/23/2023 9:49 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



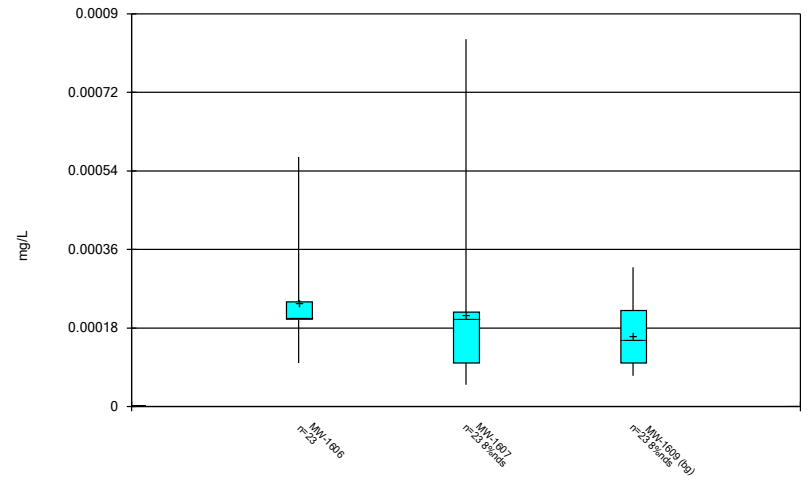
Constituent: Beryllium total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



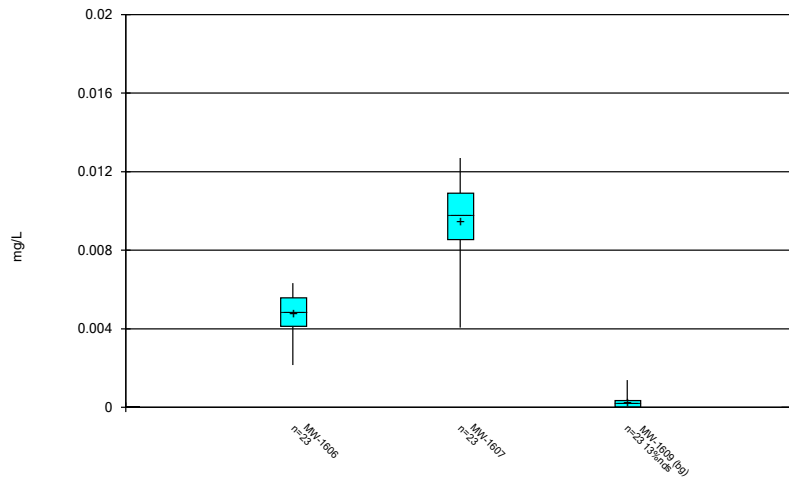
Constituent: Cadmium total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



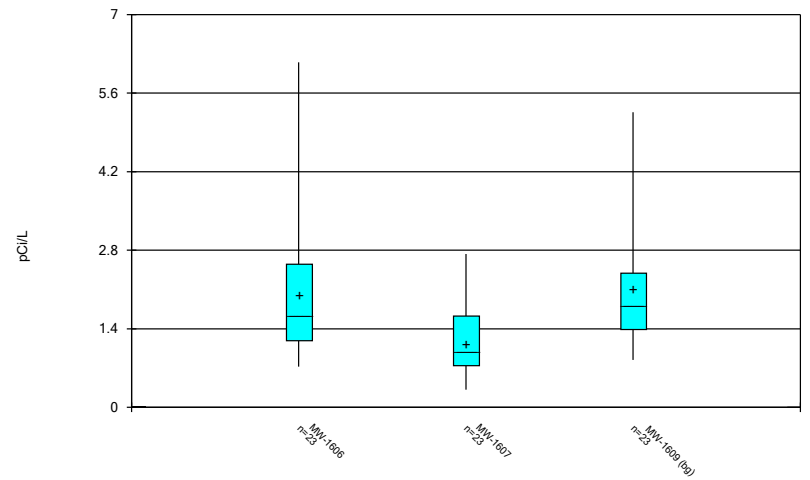
Constituent: Chromium total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



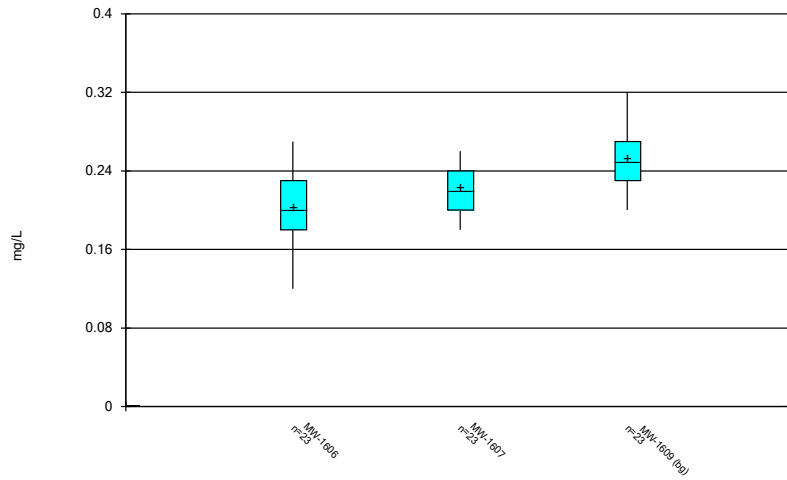
Constituent: Cobalt total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



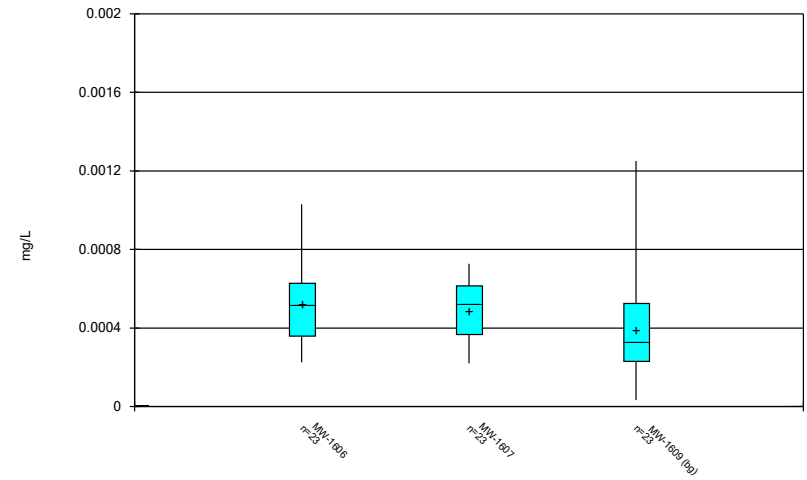
Constituent: Combined Radium 226 and 228 Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - P
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



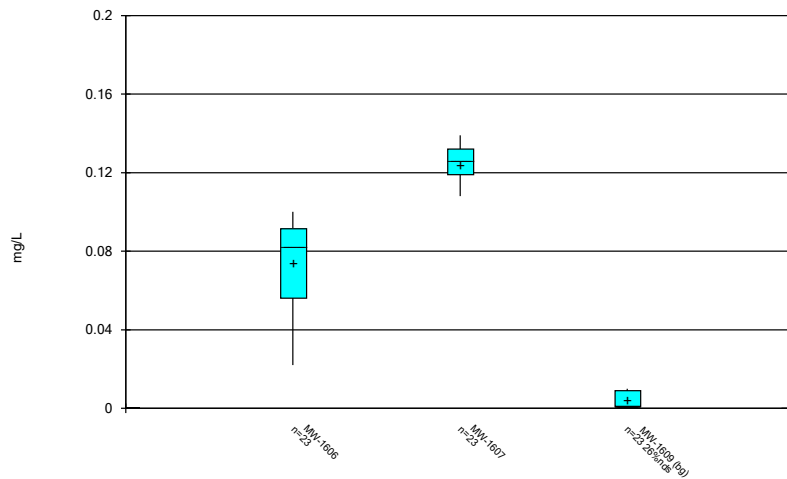
Constituent: Fluoride total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



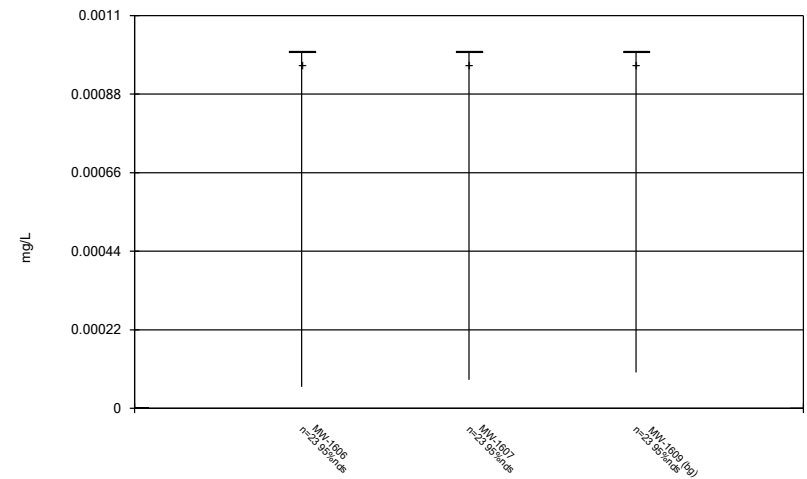
Constituent: Lead total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



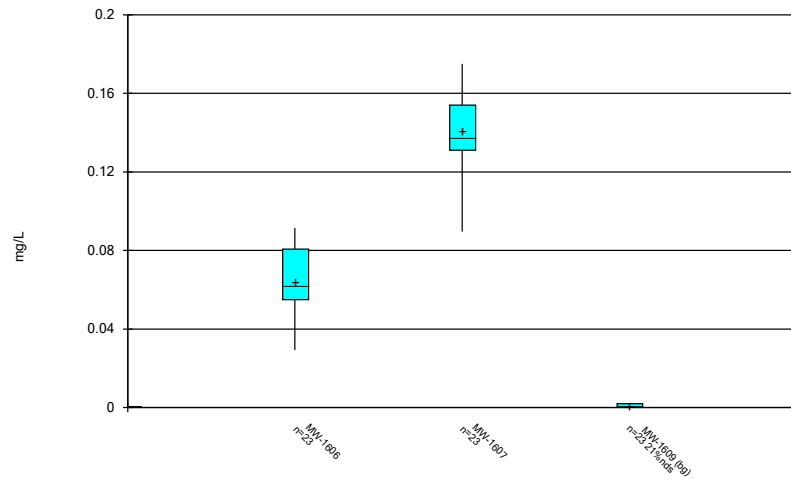
Constituent: Lithium total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



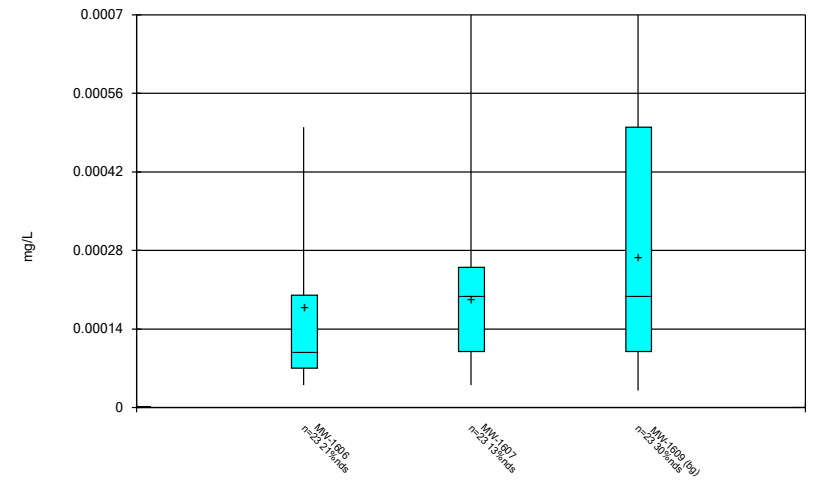
Constituent: Mercury total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



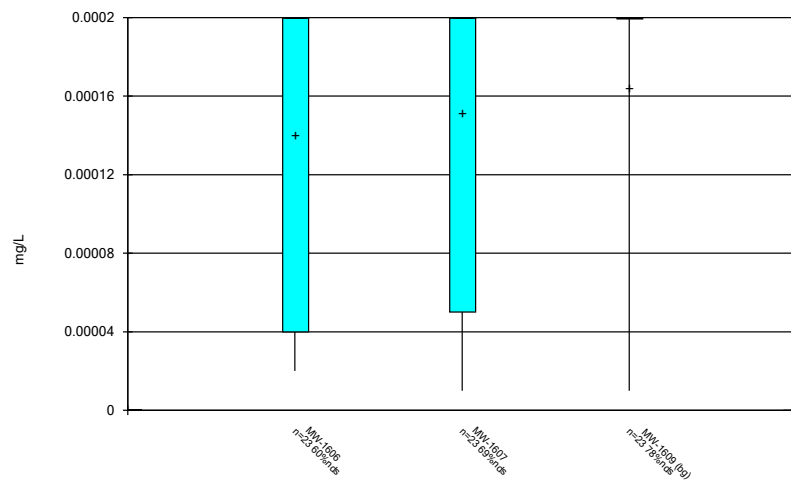
Constituent: Molybdenum total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Selenium total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

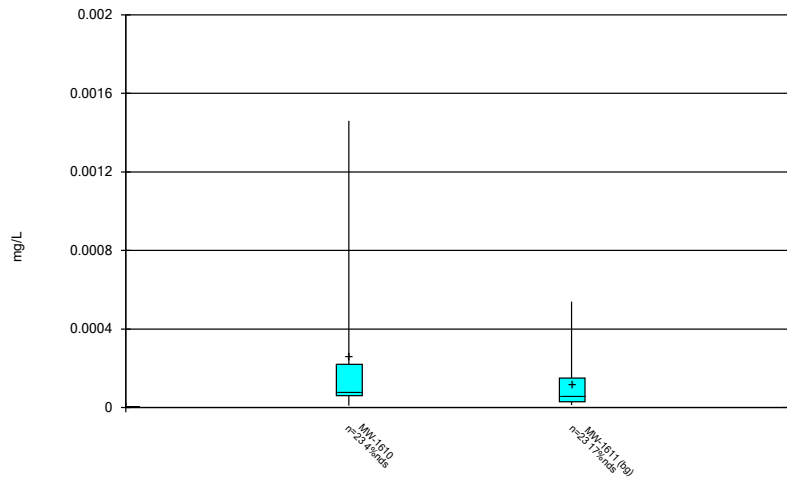
Box & Whiskers Plot



Constituent: Thallium total Analysis Run 6/23/2023 9:50 AM View: Rome Limestone - Pond 1
Clinch River Client: AEP Data: Clinch River

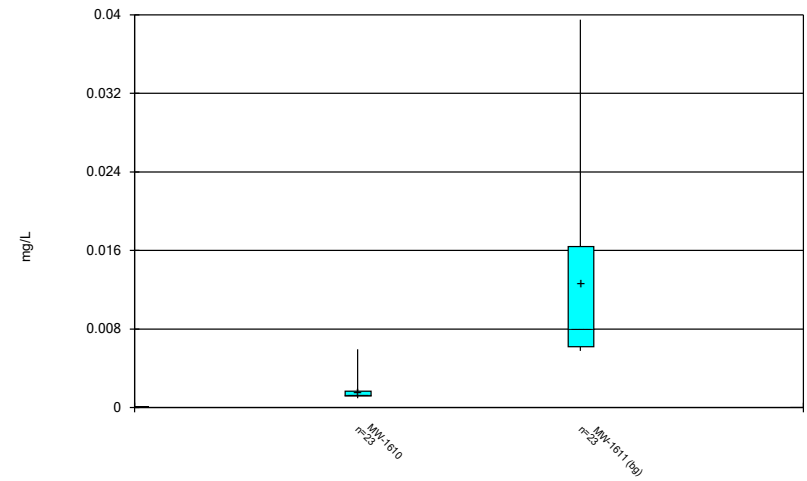
Box Plots - Dumps Fault

Box & Whiskers Plot



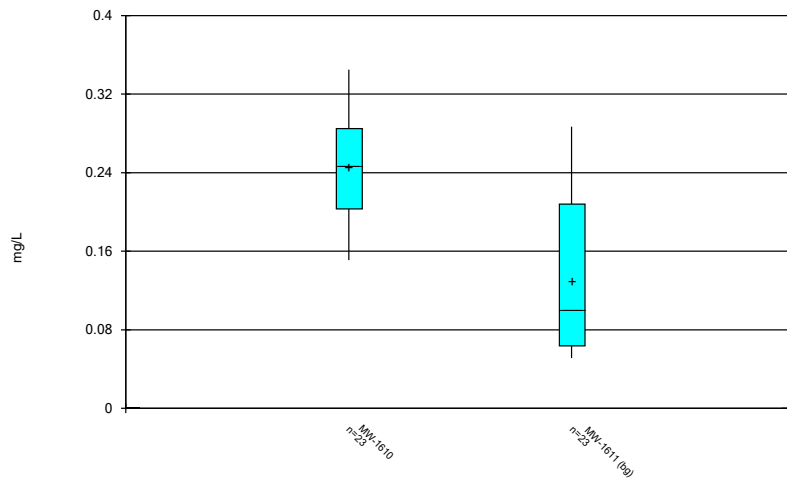
Constituent: Antimony total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



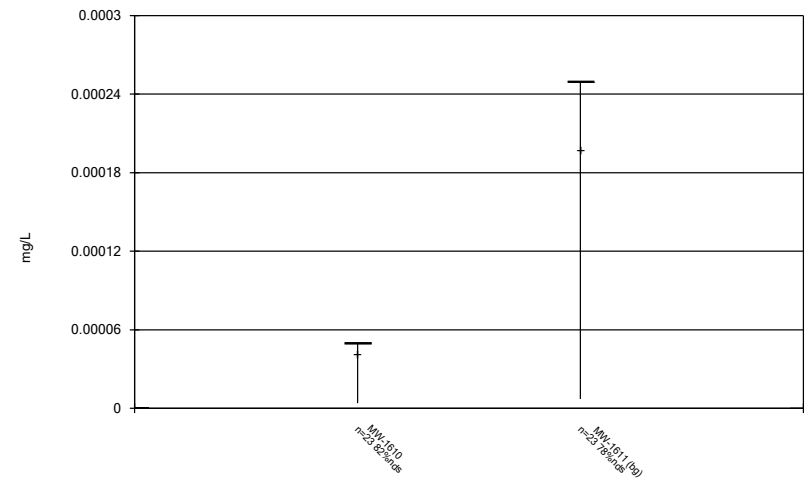
Constituent: Arsenic total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



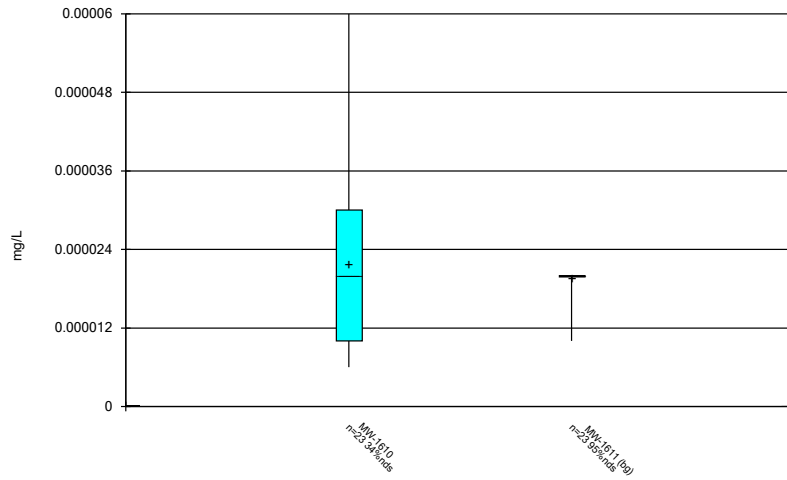
Constituent: Barium total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



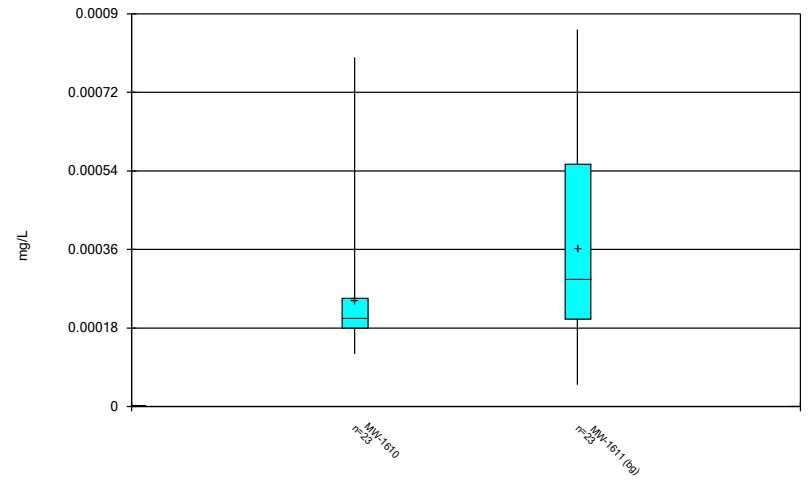
Constituent: Beryllium total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



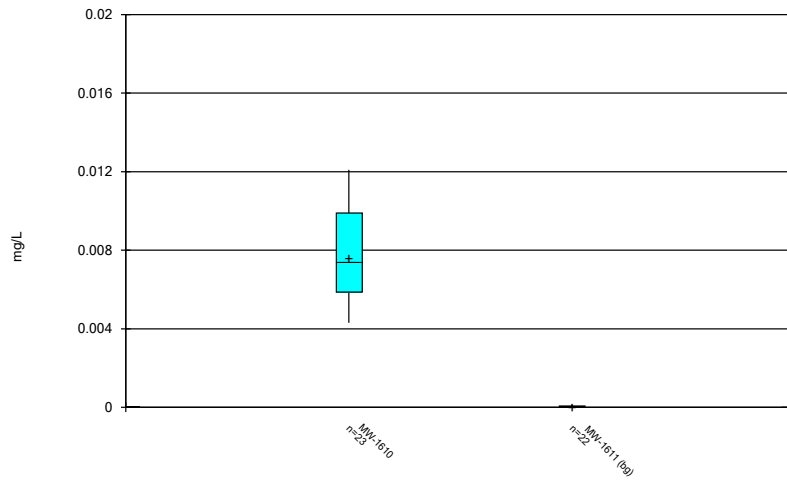
Constituent: Cadmium total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



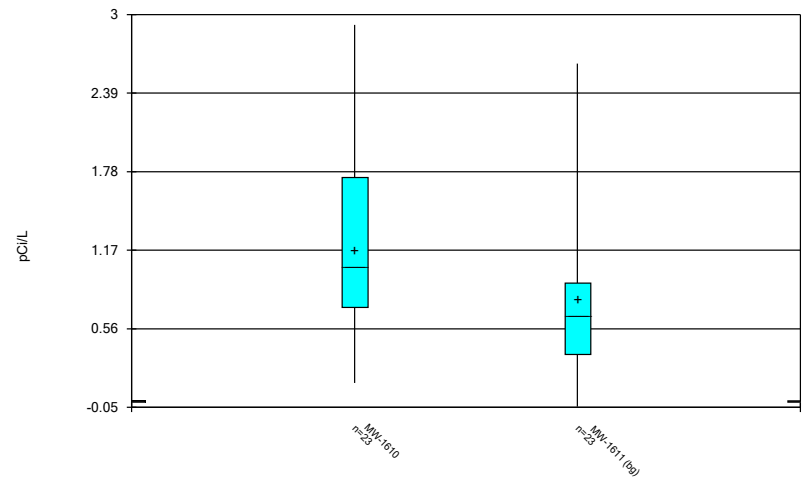
Constituent: Chromium total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



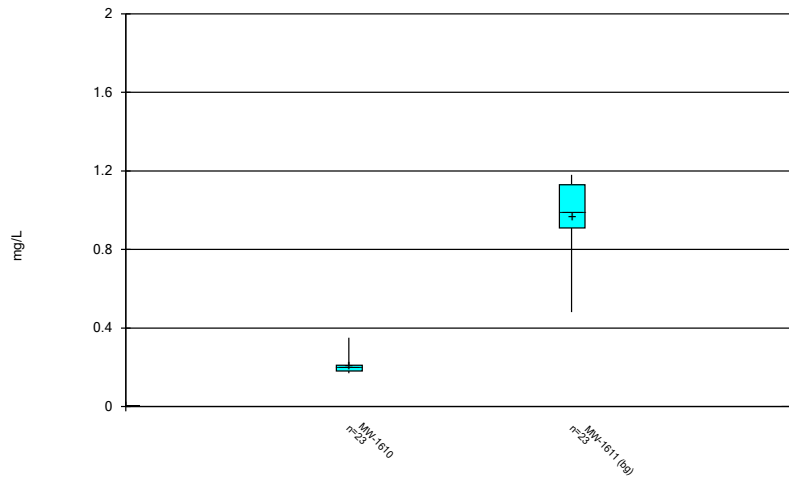
Constituent: Cobalt total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



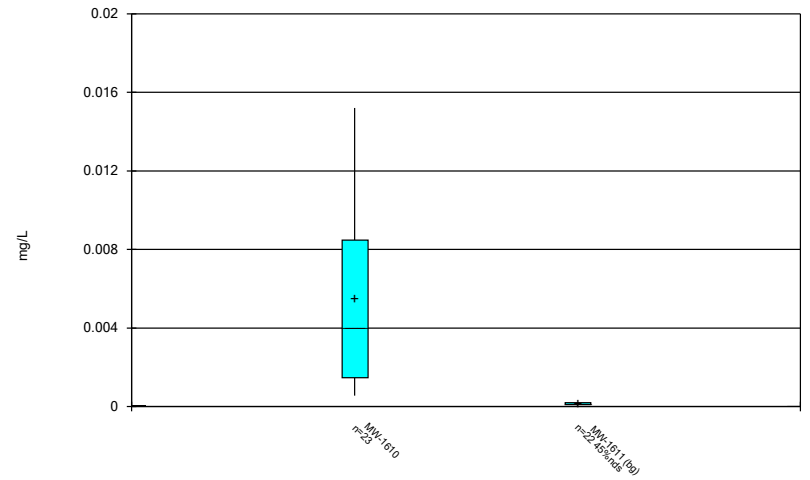
Constituent: Combined Radium 226 and 228 Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



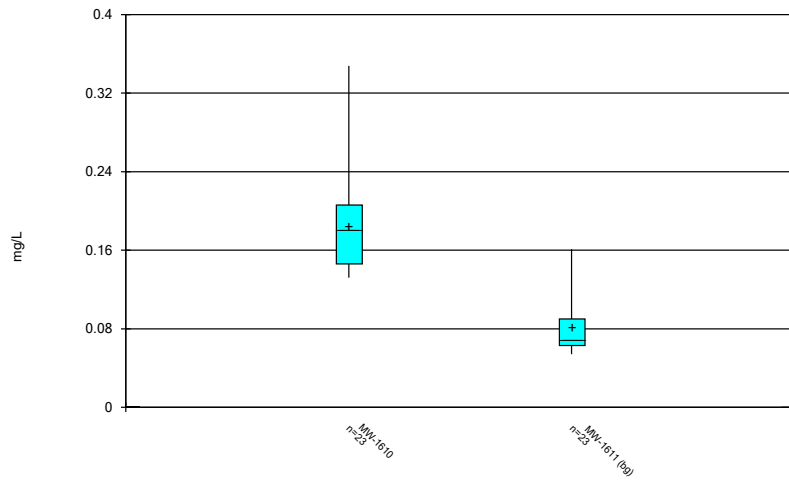
Constituent: Fluoride total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



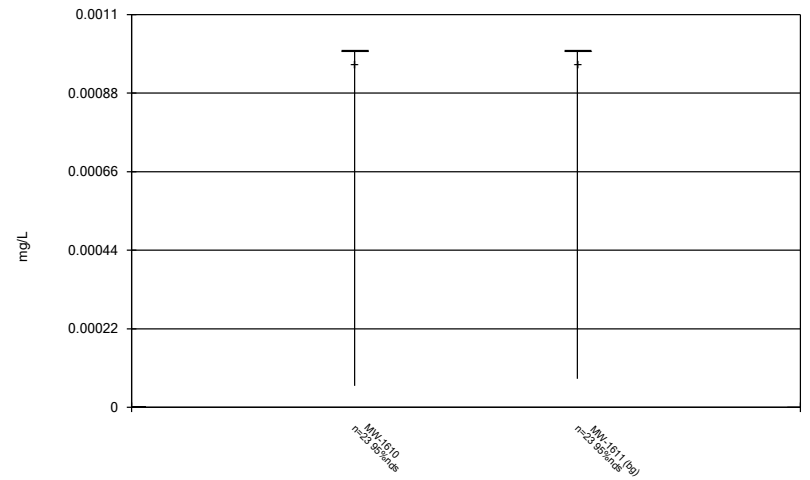
Constituent: Lead total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



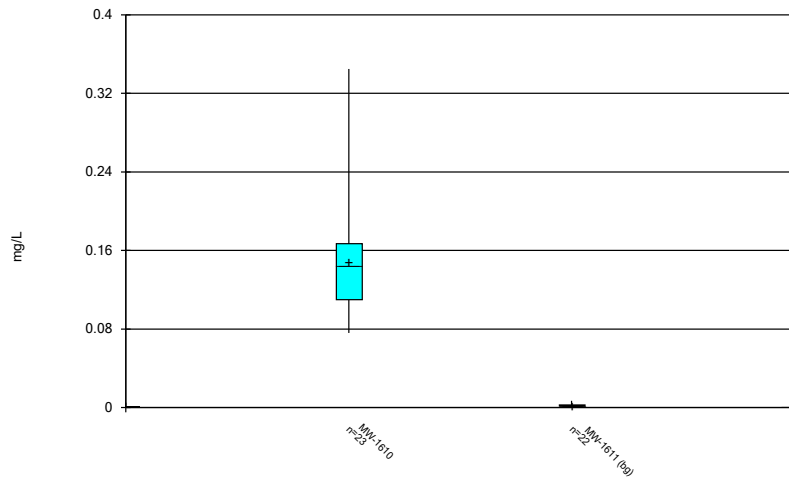
Constituent: Lithium total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



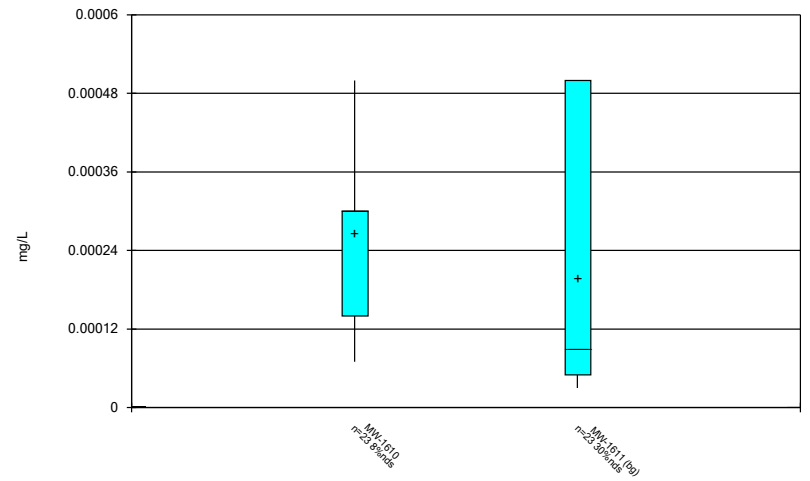
Constituent: Mercury total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



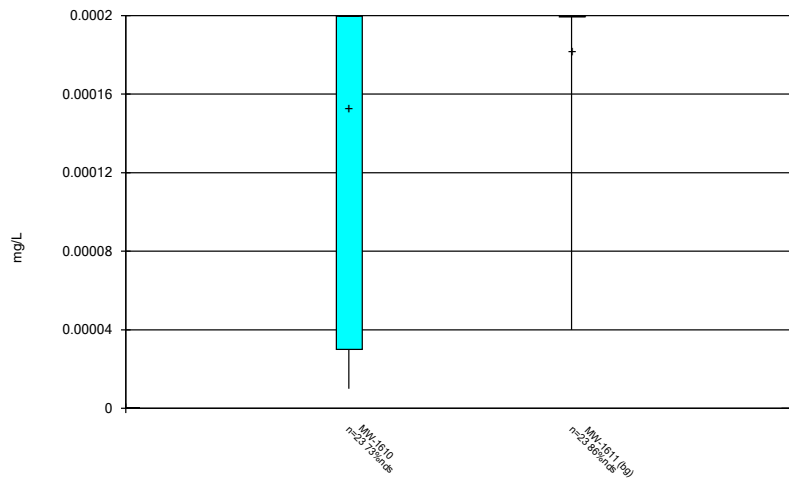
Constituent: Molybdenum total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Selenium total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Thallium total Analysis Run 6/23/2023 10:37 AM View: Dumps Fault - Pond 1
Clinch River Client: AEP Data: Clinch River

FIGURE C.

Outlier Summary - Chattanooga Shale

Clinch River Client: AEP Data: Clinch River Printed 6/14/2023, 10:58 AM

MW-1602 Combined Radium 226 and 228 (pCi/L)

2/13/2023

15.74 (o)

Outlier Summary - Rome Limestone

Clinch River Client: AEP Data: Clinch River Printed 6/14/2023, 11:28 AM

No values were flagged as outliers.

Outlier Summary - Dumps Fault

Clinch River Client: AEP Data: Clinch River Printed 6/14/2023, 11:41 AM

	MW-1611 Cobalt total (mg/L)	MW-1611 Lead total (mg/L)	MW-1611 Molybdenum total (mg/L)
10/19/2017	0.000311 (o)	0.00105 (o)	0.038 (o)

FIGURE D.

Tolerance Limits Summary Table - Chattanooga Shale - All Results

Clinch River Client: AEP Data: Clinch River Printed 1/12/2023, 4:14 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig. Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony total (mg/L)	0.0003757	n/a	n/a	n/a	n/a 63	-9.538	0.8229	3.175	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	0.0258	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Barium total (mg/L)	0.306	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Beryllium total (mg/L)	0.000066	n/a	n/a	n/a	n/a 63	n/a	n/a	65.08	n/a	n/a	0.0395	NP Inter(NDs)
Cadmium total (mg/L)	0.00003	n/a	n/a	n/a	n/a 63	n/a	n/a	85.71	n/a	n/a	0.0395	NP Inter(NDs)
Chromium total (mg/L)	0.001118	n/a	n/a	n/a	n/a 63	-8.217	0.708	1.587	None	ln(x)	0.05	Inter
Cobalt total (mg/L)	0.0003833	n/a	n/a	n/a	n/a 63	0.04558	0.01349	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	2.621	n/a	n/a	n/a	n/a 63	0.8998	0.2387	0	None	x^(1/3)	0.05	Inter
Fluoride total (mg/L)	2.42	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Lead total (mg/L)	0.0004926	n/a	n/a	n/a	n/a 63	0.0452	0.01683	25.4	Kaplan-Meier	x^(1/3)	0.05	Inter
Lithium total (mg/L)	0.118	n/a	n/a	n/a	n/a 63	n/a	n/a	1.587	n/a	n/a	0.0395	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 63	n/a	n/a	88.89	n/a	n/a	0.0395	NP Inter(NDs)
Molybdenum total (mg/L)	0.0257	n/a	n/a	n/a	n/a 63	n/a	n/a	0	n/a	n/a	0.0395	NP Inter(normality)
Selenium total (mg/L)	0.0005	n/a	n/a	n/a	n/a 63	n/a	n/a	49.21	n/a	n/a	0.0395	NP Inter(normality)
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 63	n/a	n/a	77.78	n/a	n/a	0.0395	NP Inter(NDs)

Tolerance Limits Summary Table - Rome Limestone - All Results

Clinch River Client: AEP Data: Clinch River Printed 1/13/2023, 4:32 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	0.0001053	n/a	n/a	n/a	n/a 21	0.005718	0.001917	9.524	None	sqrt(x)	0.05	Inter
Arsenic total (mg/L)	0.00097	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Barium total (mg/L)	0.5118	n/a	n/a	n/a	n/a 21	0.3951	0.04923	0	None	No	0.05	Inter
Beryllium total (mg/L)	0.00005	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Cadmium total (mg/L)	0.00004	n/a	n/a	n/a	n/a 21	n/a	n/a	19.05	n/a	n/a	0.3406	NP Inter(normality)
Chromium total (mg/L)	0.0003212	n/a	n/a	n/a	n/a 21	0.0001565	0.00006946	9.524	None	No	0.05	Inter
Cobalt total (mg/L)	0.00125	n/a	n/a	n/a	n/a 21	0.01377	0.009102	14.29	None	sqrt(x)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	4.999	n/a	n/a	n/a	n/a 21	1.407	0.3494	0	None	sqrt(x)	0.05	Inter
Fluoride total (mg/L)	0.337	n/a	n/a	n/a	n/a 21	0.2543	0.03487	0	None	No	0.05	Inter
Lead total (mg/L)	0.001186	n/a	n/a	n/a	n/a 21	0.01924	0.006408	0	None	sqrt(x)	0.05	Inter
Lithium total (mg/L)	0.01	n/a	n/a	n/a	n/a 21	n/a	n/a	28.57	n/a	n/a	0.3406	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Molybdenum total (mg/L)	0.00222	n/a	n/a	n/a	n/a 21	n/a	n/a	23.81	n/a	n/a	0.3406	NP Inter(normality)
Selenium total (mg/L)	0.0003912	n/a	n/a	n/a	n/a 21	0.008041	0.00495	28.57	Kaplan-Meier	sqrt(x)	0.05	Inter
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 21	n/a	n/a	76.19	n/a	n/a	0.3406	NP Inter(NDs)

Tolerance Limits Summary Table - Dumps Fault - All Results

Clinch River Client: AEP Data: Clinch River Printed 1/13/2023, 4:11 PM

Constituent	Upper Lim.	Lower Lim.	Date	Observ.	Sig. Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	0.0008018	n/a	n/a	n/a	n/a 21	-9.577	1.033	14.29	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	0.0395	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Barium total (mg/L)	0.2823	n/a	n/a	n/a	n/a 21	0.3274	0.08602	0	None	sqrt(x)	0.05	Inter
Beryllium total (mg/L)	0.00005	n/a	n/a	n/a	n/a 21	n/a	n/a	76.19	n/a	n/a	0.3406	NP Inter(NDs)
Cadmium total (mg/L)	0.00002	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Chromium total (mg/L)	0.0009231	n/a	n/a	n/a	n/a 21	0.0003836	0.0002275	0	None	No	0.05	Inter
Cobalt total (mg/L)	0.0001361	n/a	n/a	n/a	n/a 20	0.0000498	0.000036	0	None	No	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	1.698	n/a	n/a	n/a	n/a 21	0.648	0.443	0	None	No	0.05	Inter
Fluoride total (mg/L)	1.375	n/a	n/a	n/a	n/a 21	0.9571	0.1762	0	None	No	0.05	Inter
Lead total (mg/L)	0.0002	n/a	n/a	n/a	n/a 20	n/a	n/a	40	n/a	n/a	0.3585	NP Inter(normality)
Lithium total (mg/L)	0.161	n/a	n/a	n/a	n/a 21	n/a	n/a	0	n/a	n/a	0.3406	NP Inter(normality)
Mercury total (mg/L)	0.001	n/a	n/a	n/a	n/a 21	n/a	n/a	95.24	n/a	n/a	0.3406	NP Inter(NDs)
Molybdenum total (mg/L)	0.005519	n/a	n/a	n/a	n/a 20	-6.138	0.3916	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	0.0005	n/a	n/a	n/a	n/a 21	n/a	n/a	23.81	n/a	n/a	0.3406	NP Inter(normality)
Thallium total (mg/L)	0.0002	n/a	n/a	n/a	n/a 21	n/a	n/a	85.71	n/a	n/a	0.3406	NP Inter(NDs)

FIGURE E.

CLINCH RIVER GWPS - CHATTANOOGA SHALE				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00038	0.006
Arsenic, Total (mg/L)	0.01		0.026	0.026
Barium, Total (mg/L)	2		0.31	2
Beryllium, Total (mg/L)	0.004		0.000066	0.004
Cadmium, Total (mg/L)	0.005		0.00003	0.005
Chromium, Total (mg/L)	0.1		0.00112	0.1
Cobalt, Total (mg/L)		0.006	0.00038	0.006
Combined Radium, Total (pCi/L)	5		2.62	5
Fluoride, Total (mg/L)	4		2.42	4
Lead, Total (mg/L)		0.015	0.00049	0.015
Lithium, Total (mg/L)		0.04	0.118	0.118
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.026	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**Grey cell indicates background is higher than MCL or CCR Rule*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - ROME LIMESTONE				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.00011	0.006
Arsenic, Total (mg/L)	0.01		0.00097	0.01
Barium, Total (mg/L)	2		0.51	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00004	0.005
Chromium, Total (mg/L)	0.1		0.00032	0.1
Cobalt, Total (mg/L)		0.006	0.0013	0.006
Combined Radium, Total (pCi/L)	5		5	5
Fluoride, Total (mg/L)	4		0.34	4
Lead, Total (mg/L)		0.015	0.0012	0.015
Lithium, Total (mg/L)		0.04	0.01	0.04
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0022	0.1
Selenium, Total (mg/L)	0.05		0.00039	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

CLINCH RIVER GWPS - DUMPS FAULT				
Constituent Name	MCL	CCR Rule Specified	Background Limit	GWPS
Antimony, Total (mg/L)	0.006		0.0008	0.006
Arsenic, Total (mg/L)	0.01		0.04	0.04
Barium, Total (mg/L)	2		0.28	2
Beryllium, Total (mg/L)	0.004		0.00005	0.004
Cadmium, Total (mg/L)	0.005		0.00002	0.005
Chromium, Total (mg/L)	0.1		0.00092	0.1
Cobalt, Total (mg/L)		0.006	0.00014	0.006
Combined Radium, Total (pCi/L)	5		1.7	5
Fluoride, Total (mg/L)	4		1.38	4
Lead, Total (mg/L)		0.015	0.0002	0.015
Lithium, Total (mg/L)		0.04	0.161	0.161
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0055	0.1
Selenium, Total (mg/L)	0.05		0.0005	0.05
Thallium, Total (mg/L)	0.002		0.0002	0.002

**Grey cell indicates background is higher than MCL or CCR Rule*

**MCL = Maximum Contaminant Level*

**CCR = Coal Combustion Residual*

**GWPS = Groundwater Protection Standard*

FIGURE F.

Confidence Interval - Chattanooga Shale - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:39 AM

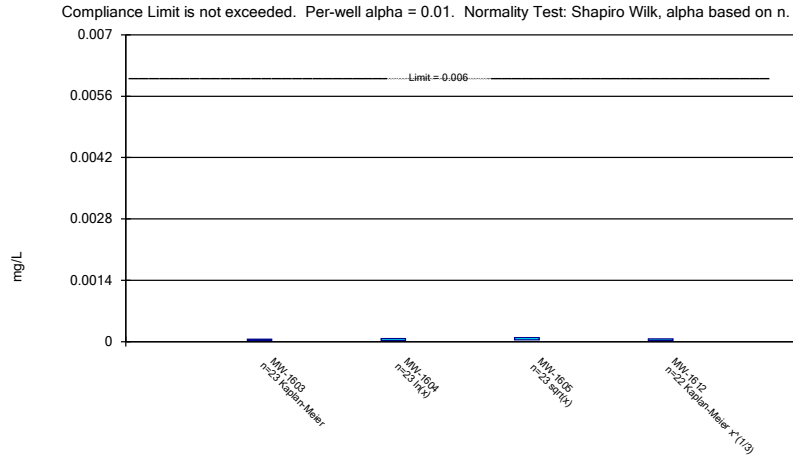
<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium total (mg/L)	MW-1603	2.775	2.209	2	Yes	23	2.492	0.5409	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.269	3.104	2	Yes	23	3.187	0.1572	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.384	2.085	2	Yes	22	2.235	0.2779	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2007	0.1878	0.118	Yes	23	0.1943	0.01241	0	None	No	0.01	Param.

Confidence Interval - Chattanooga Shale - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:39 AM

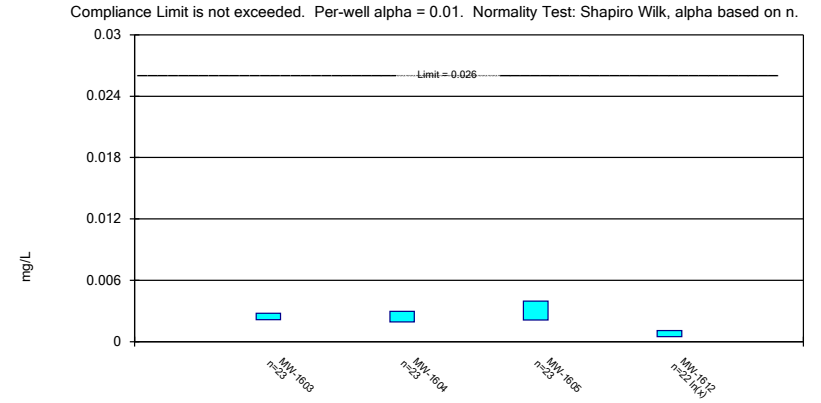
Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1603	0.0005348	0.00002417	0.006	No	23	0.0000523	0.00002908	17.39	Kaplan-Meier	No	0.01	Param.
Antimony total (mg/L)	MW-1604	0.00007168	0.00002788	0.006	No	23	0.00006883	0.00008654	13.04	None	ln(x)	0.01	Param.
Antimony total (mg/L)	MW-1605	0.00009106	0.00003906	0.006	No	23	0.00007183	0.00006349	13.04	None	sqrt(x)	0.01	Param.
Antimony total (mg/L)	MW-1612	0.00006353	0.00002359	0.006	No	22	0.00007195	0.00006356	22.73	Kaplan-Meier	x^(1/3)	0.01	Param.
Arsenic total (mg/L)	MW-1603	0.00276	0.002141	0.026	No	23	0.00245	0.0005912	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1604	0.002949	0.001912	0.026	No	23	0.00243	0.0009913	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1605	0.003964	0.002115	0.026	No	23	0.00304	0.001767	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1612	0.001082	0.0004823	0.026	No	22	0.0009818	0.0009163	0	None	ln(x)	0.01	Param.
Barium total (mg/L)	MW-1603	2.775	2.209	2	Yes	23	2.492	0.5409	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.269	3.104	2	Yes	23	3.187	0.1572	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1605	1.964	1.422	2	No	23	1.693	0.5182	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.384	2.085	2	Yes	22	2.235	0.2779	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1603	0.00005	0.00001	0.004	No	23	0.00003926	0.00001849	73.91	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1604	0.00005	0.000007	0.004	No	23	0.00004617	0.00001268	91.3	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1605	0.00005	0.00001	0.004	No	23	0.0000443	0.00001507	86.96	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1612	0.00005	0.000045	0.004	No	22	0.00004391	0.00001507	81.82	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1605	0.00002	0.00001	0.005	No	23	0.00001957	0.000002085	91.3	None	No	0.01	NP (NDs)
Chromium total (mg/L)	MW-1603	0.0002431	0.000161	0.1	No	23	0.0002093	0.00008708	0	None	x^(1/3)	0.01	Param.
Chromium total (mg/L)	MW-1604	0.000248	0.000116	0.1	No	23	0.0002498	0.0003267	0	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1605	0.0002621	0.0001695	0.1	No	23	0.0002158	0.00008854	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1612	0.000218	0.00018	0.1	No	22	0.0002061	0.00008221	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1603	0.0005014	0.000273	0.006	No	23	0.0003872	0.0002184	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1604	0.000635	0.0003506	0.006	No	23	0.0004928	0.0002718	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1605	0.000316	0.00004	0.006	No	23	0.0001783	0.0001402	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1612	0.0001985	0.0001203	0.006	No	22	0.0001672	0.00008137	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1603	1.637	0.9344	5	No	23	1.286	0.6713	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1604	1.55	1.01	5	No	23	1.28	0.5163	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1605	2.159	1.132	5	No	23	1.704	1.316	0	None	No	0.01	NP (normality)
Combined Radium 226 and 228 (pCi/L)	MW-1612	2.24	1.442	5	No	22	1.841	0.7435	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1603	0.1349	0.1085	4	No	23	0.1226	0.02649	0	None	sqrt(x)	0.01	Param.
Fluoride total (mg/L)	MW-1604	0.2872	0.2415	4	No	23	0.2643	0.04378	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1605	0.3659	0.3272	4	No	23	0.3465	0.037	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1612	0.1812	0.1433	4	No	22	0.1623	0.03531	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1603	0.0002	0.000038	0.015	No	23	0.0001524	0.00008205	73.91	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1604	0.0002	0.00006	0.015	No	23	0.0001493	0.00007932	69.57	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1605	0.0002	0.00005	0.015	No	23	0.0001342	0.00007749	56.52	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1612	0.0002	0.000083	0.015	No	22	0.000164	0.00007989	68.18	None	No	0.01	NP (NDs)
Lithium total (mg/L)	MW-1603	0.07743	0.05857	0.118	No	23	0.068	0.01803	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1604	0.08196	0.07448	0.118	No	23	0.07822	0.007147	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2007	0.1878	0.118	Yes	23	0.1943	0.01241	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1612	0.1285	0.1107	0.118	No	22	0.1183	0.02004	4.545	None	x^2	0.01	Param.
Mercury total (mg/L)	MW-1603	0.001	0.00006	0.002	No	23	0.0009591	0.000196	95.65	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1604	0.001	0.00006	0.002	No	23	0.0009591	0.000196	95.65	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1612	0.001	0.00006	0.002	No	22	0.0009573	0.0002004	95.45	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1603	0.001147	0.0005265	0.1	No	23	0.001057	0.001025	0	None	ln(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1604	0.0005407	0.0002505	0.1	No	23	0.0008404	0.000697	17.39	Kaplan-Meier	ln(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1605	0.00305	0.0009631	0.1	No	23	0.002372	0.002408	0	None	sqrt(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1612	0.001098	0.0003837	0.1	No	22	0.0008468	0.0008254	4.545	None	sqrt(x)	0.01	Param.
Selenium total (mg/L)	MW-1603	0.00011	0.00007	0.05	No	23	0.0001535	0.0001636	17.39	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1604	0.0005	0.00005	0.05	No	23	0.0002452	0.0002287	43.48	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1605	0.0005	0.00007	0.05	No	23	0.0003265	0.0002214	60.87	None	No	0.01	NP (NDs)
Selenium total (mg/L)	MW-1612	0.0005	0.00004	0.05	No	22	0.0003141	0.0002291	59.09	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1603	0.0002	0.00002	0.002	No	23	0.0001591	0.00007931	78.26	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1604	0.0002	0.00002	0.002	No	23	0.0001674	0.00007269	82.61	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1605	0.0002	0.00002	0.002	No	23	0.0001678	0.00007173	82.61	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1612	0.0002	0.00003	0.002	No	22	0.0001664	0.00007313	81.82	None	No	0.01	NP (NDs)

Parametric Confidence Interval



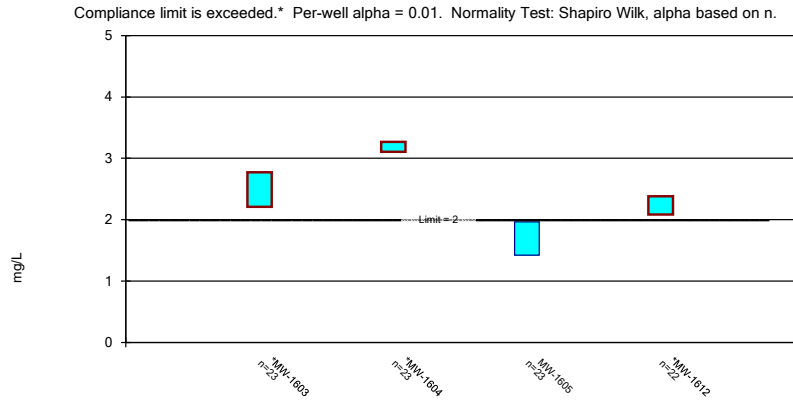
Constituent: Antimony total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval



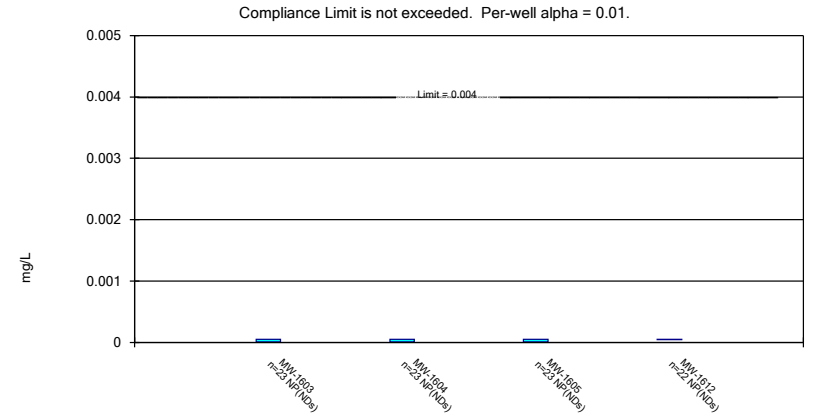
Constituent: Arsenic total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval



Constituent: Barium total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence
Clinch River Client: AEP Data: Clinch River

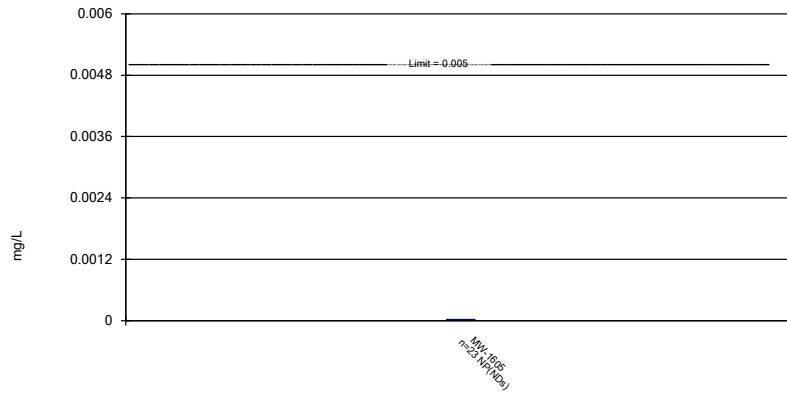
Non-Parametric Confidence Interval



Constituent: Beryllium total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

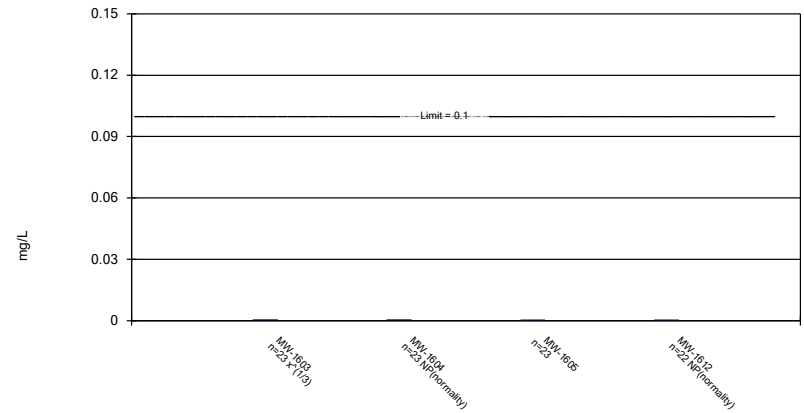
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

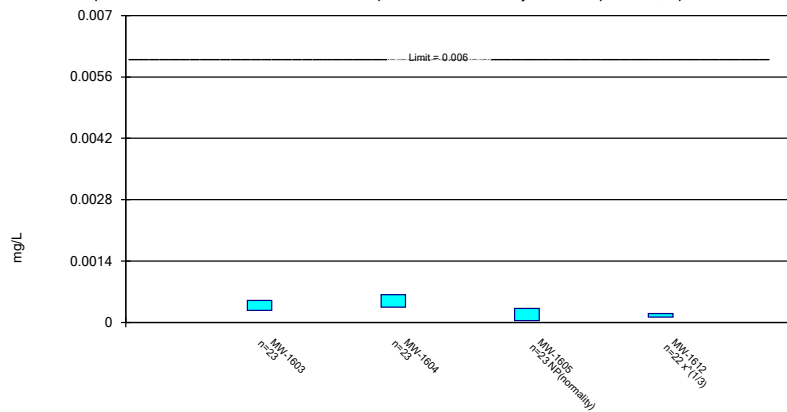
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

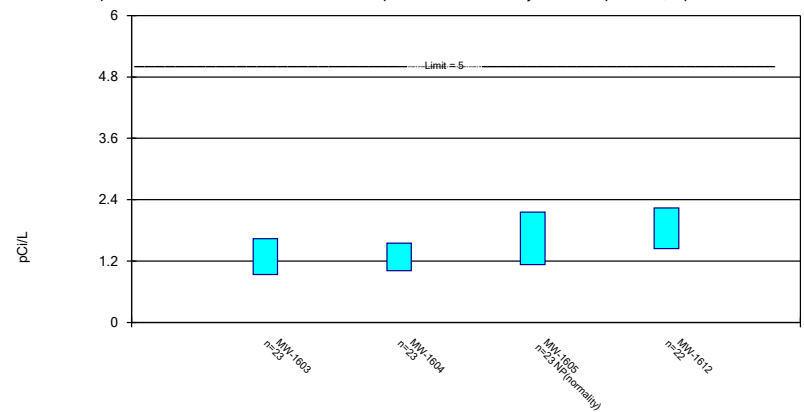
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

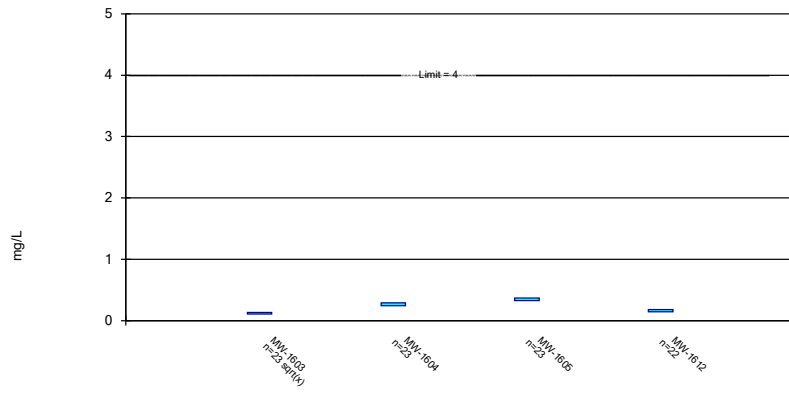
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

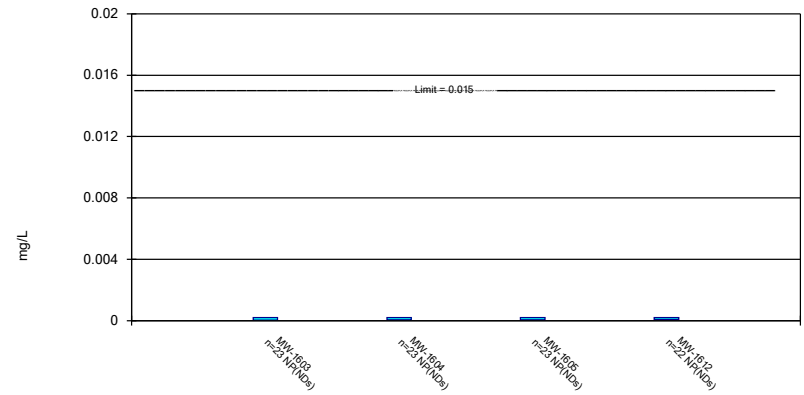
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

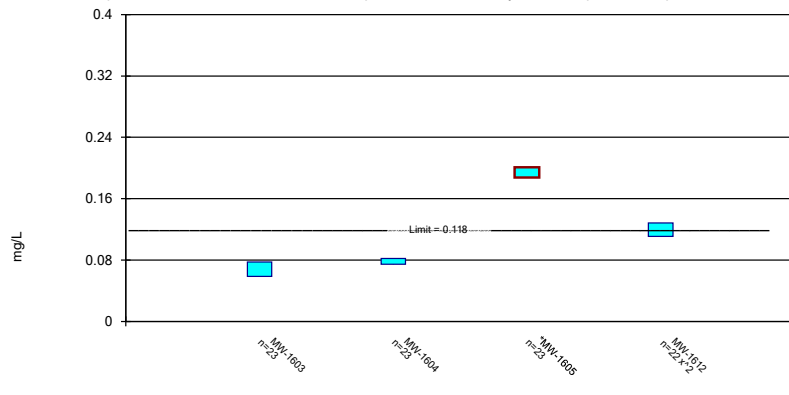
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

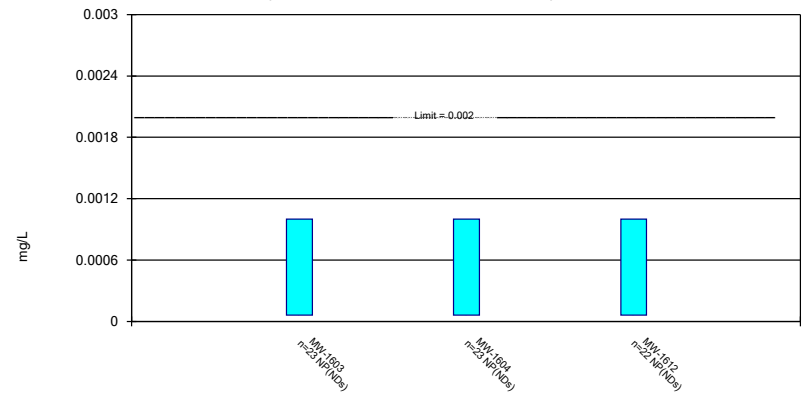
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

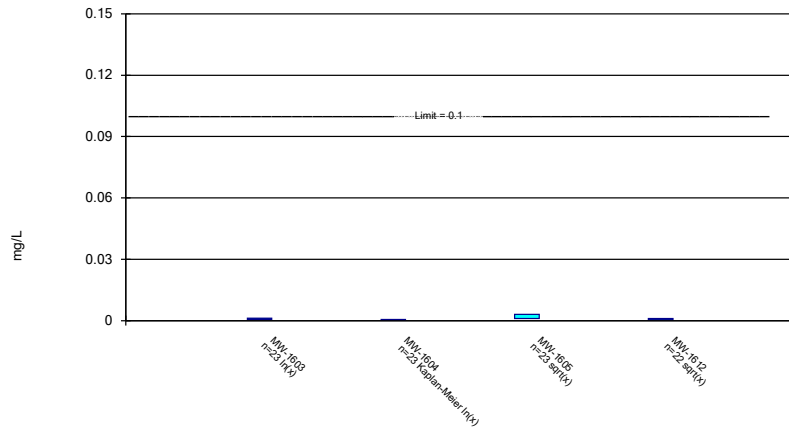
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidence Interval
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

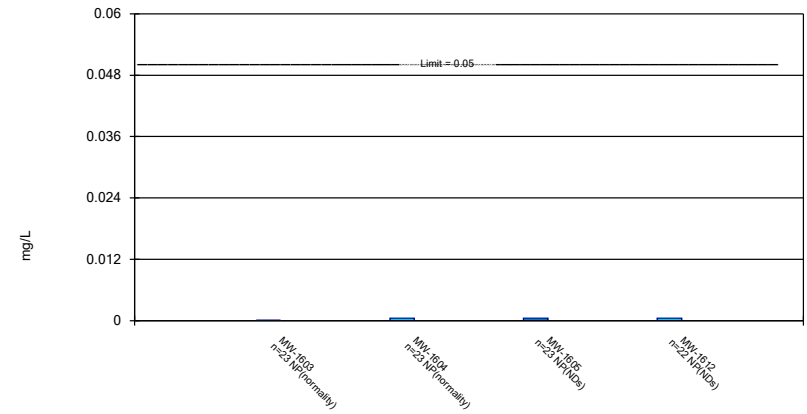
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confi
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

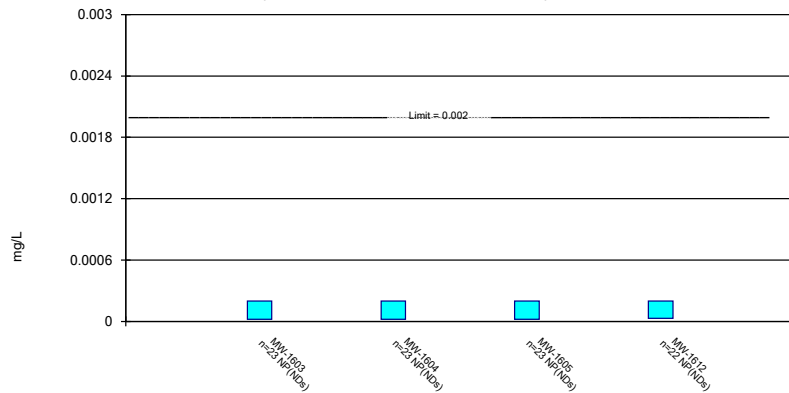
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confiden
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium total Analysis Run 6/23/2023 9:36 AM View: Chattanooga Shale - Pond 1 Confidenc
Clinch River Client: AEP Data: Clinch River

Confidence Interval - Rome Limestone - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:56 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt total (mg/L)	MW-1607	0.01051	0.008448	0.006	Yes	23	0.009479	0.001971	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.08666	0.06175	0.04	Yes	23	0.0742	0.02381	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.1288	0.1196	0.04	Yes	23	0.1242	0.008763	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1506	0.131	0.1	Yes	23	0.1408	0.0187	0	None	No	0.01	Param.

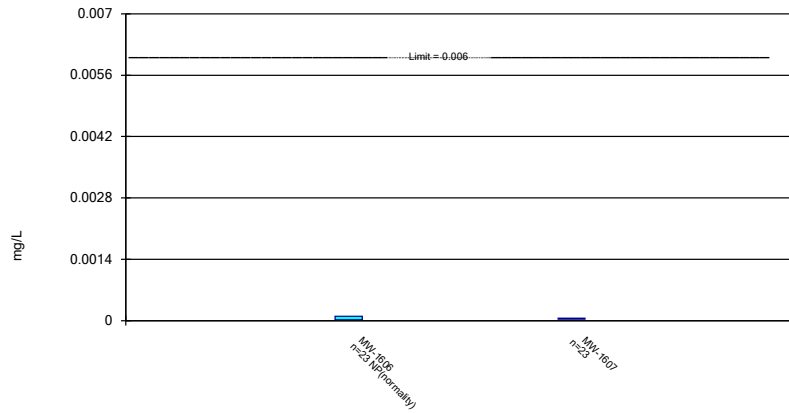
Confidence Interval - Rome Limestone - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:56 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1606	0.0001	0.00002	0.006	No	23	0.00005913	0.00003716	43.48	None	No	0.01	NP (normality)
Antimony total (mg/L)	MW-1607	0.00005157	0.00003025	0.006	No	23	0.00004091	0.00002038	4.348	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1606	0.00833	0.00689	0.01	No	23	0.008021	0.002301	0	None	No	0.01	NP (normality)
Arsenic total (mg/L)	MW-1607	0.0015	0.001	0.01	No	23	0.001515	0.001082	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1606	0.117	0.1073	2	No	23	0.1121	0.009236	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1607	0.0742	0.0679	2	No	23	0.074	0.0158	0	None	No	0.01	NP (normality)
Beryllium total (mg/L)	MW-1606	0.00025	0.000008	0.004	No	23	0.0001451	0.0001223	56.52	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1607	0.00005	0.000005	0.004	No	23	0.00004804	0.000009383	95.65	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1606	0.00002	0.00001	0.005	No	23	0.00001861	0.000007762	39.13	None	No	0.01	NP (normality)
Cadmium total (mg/L)	MW-1607	0.0001517	0.00009391	0.005	No	23	0.0001228	0.00005529	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1606	0.0002678	0.0001783	0.1	No	23	0.0002365	0.0001089	0	None	ln(x)	0.01	Param.
Chromium total (mg/L)	MW-1607	0.0002407	0.0001325	0.1	No	23	0.0002106	0.0001527	8.696	None	ln(x)	0.01	Param.
Cobalt total (mg/L)	MW-1606	0.005297	0.004247	0.006	No	23	0.004772	0.001004	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1607	0.01051	0.008448	0.006	Yes	23	0.009479	0.001971	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1606	2.41	1.408	5	No	23	1.993	1.128	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1607	1.421	0.8174	5	No	23	1.119	0.577	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1606	0.2217	0.1844	4	No	23	0.203	0.0356	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1607	0.2351	0.2101	4	No	23	0.2226	0.02397	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1606	0.0006382	0.0004084	0.015	No	23	0.0005233	0.0002197	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1607	0.0005688	0.0004056	0.015	No	23	0.0004872	0.000156	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.08666	0.06175	0.04	Yes	23	0.0742	0.02381	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.1288	0.1196	0.04	Yes	23	0.1242	0.008763	0	None	No	0.01	Param.
Mercury total (mg/L)	MW-1606	0.001	0.00006	0.002	No	23	0.0009591	0.000196	95.65	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1607	0.001	0.00008	0.002	No	23	0.00096	0.0001918	95.65	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1606	0.07285	0.05488	0.1	No	23	0.06386	0.01718	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1506	0.131	0.1	Yes	23	0.1408	0.0187	0	None	No	0.01	Param.
Selenium total (mg/L)	MW-1606	0.0002	0.00007	0.05	No	23	0.0001783	0.0001763	21.74	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1607	0.0002406	0.000119	0.05	No	23	0.000193	0.0001402	13.04	None	sqrt(x)	0.01	Param.
Thallium total (mg/L)	MW-1606	0.0002	0.00005	0.002	No	23	0.00014	0.00007764	60.87	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1607	0.0002	0.00005	0.002	No	23	0.0001513	0.00007701	69.57	None	No	0.01	NP (NDs)

Parametric and Non-Parametric (NP) Confidence Interval

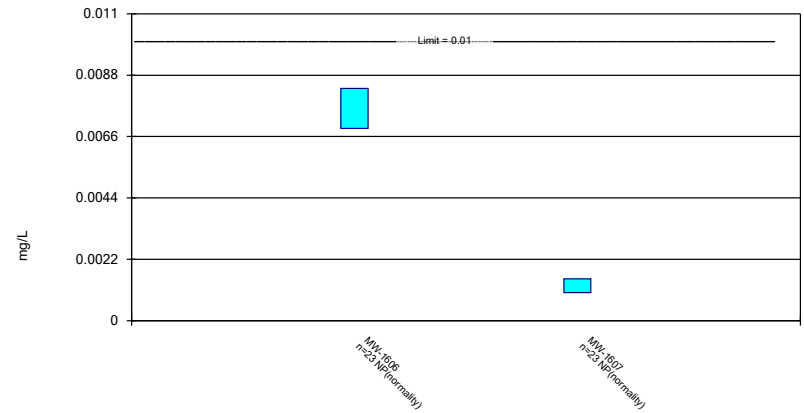
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - Pond 1 Confidence
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

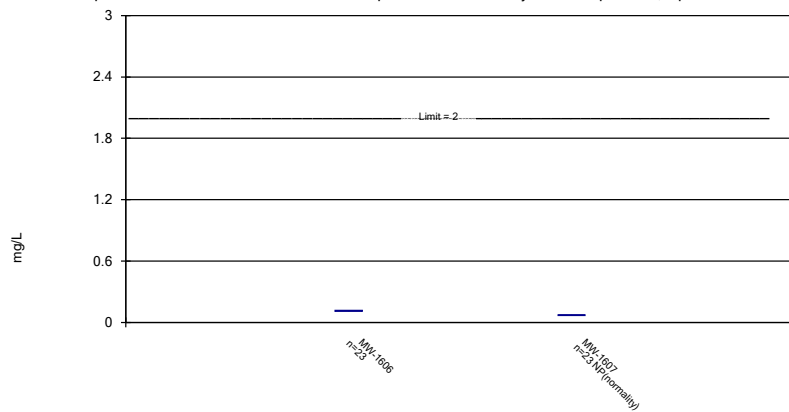
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic total Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - Pond 1 Confidence In
Clinch River Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

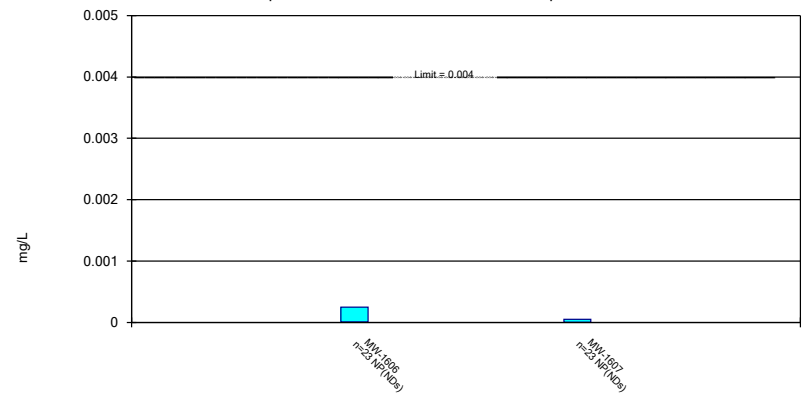
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - Pond 1 Confidence In
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

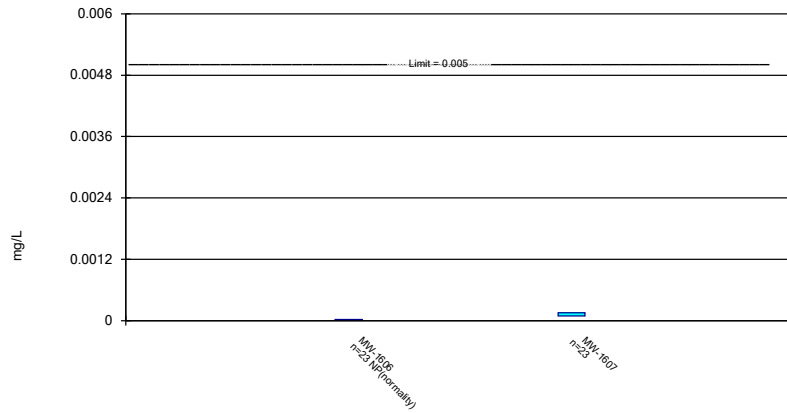
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - Pond 1 Confidence
Clinch River Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

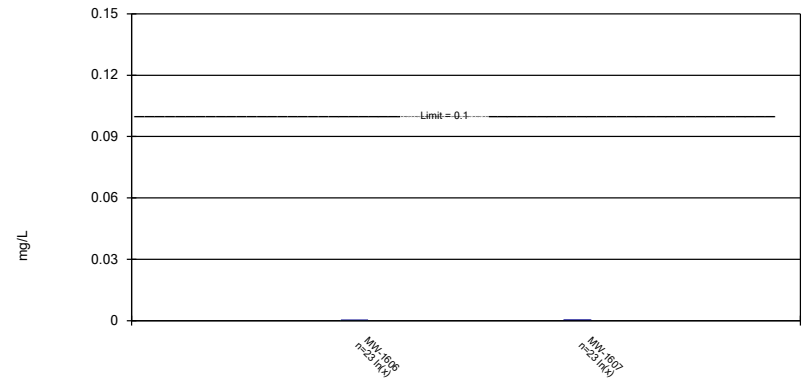
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium total Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - Pond 1 Confidence Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

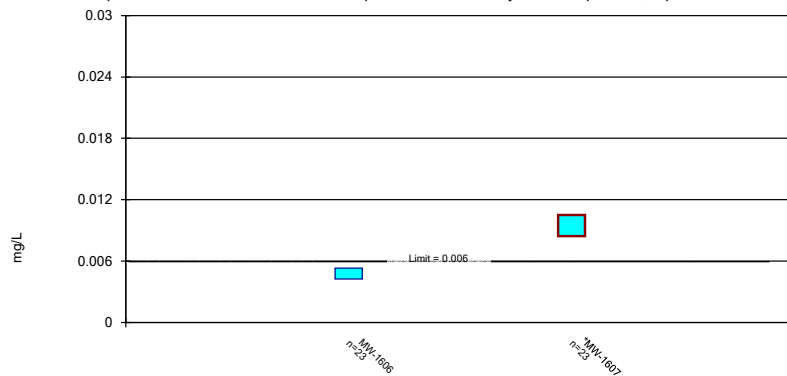
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium total Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - Pond 1 Confidence Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

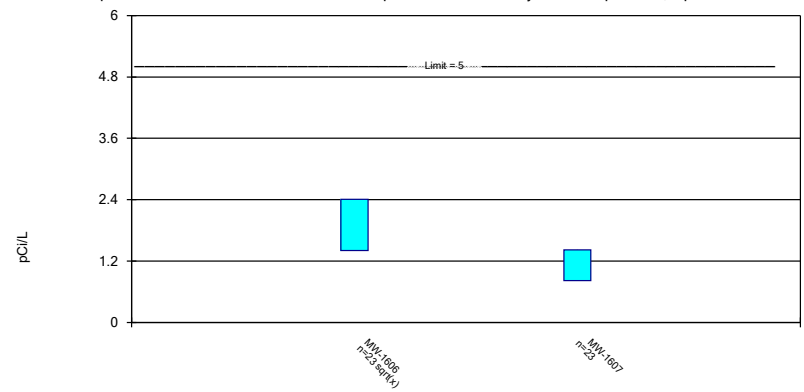
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - Pond 1 Confidence Int Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

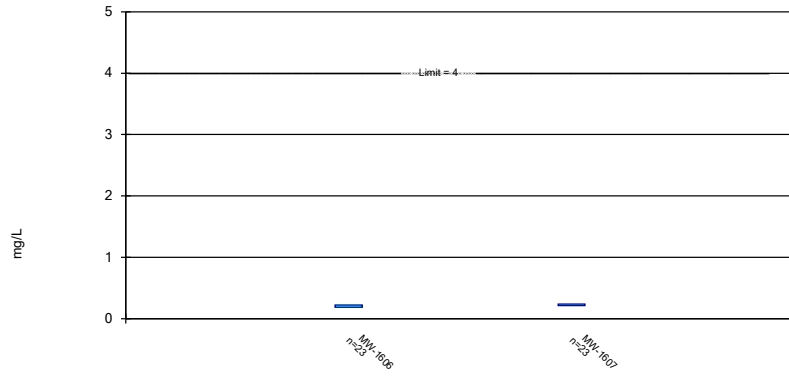
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 6/23/2023 9:53 AM View: Rome Limestone - P Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

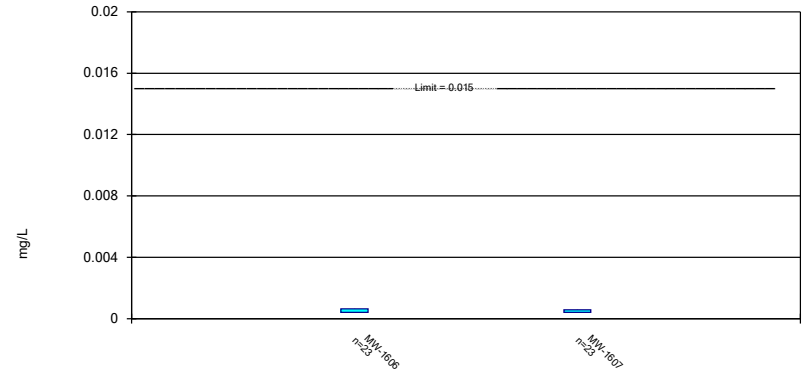
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 6/23/2023 9:54 AM View: Rome Limestone - Pond 1 Confidence I
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

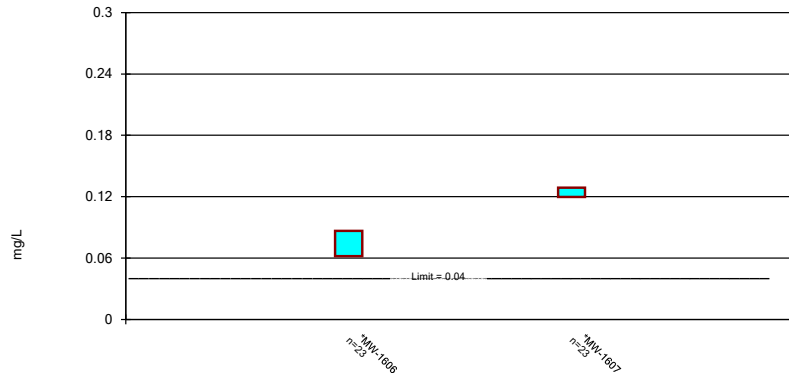
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 6/23/2023 9:54 AM View: Rome Limestone - Pond 1 Confidence Inter
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

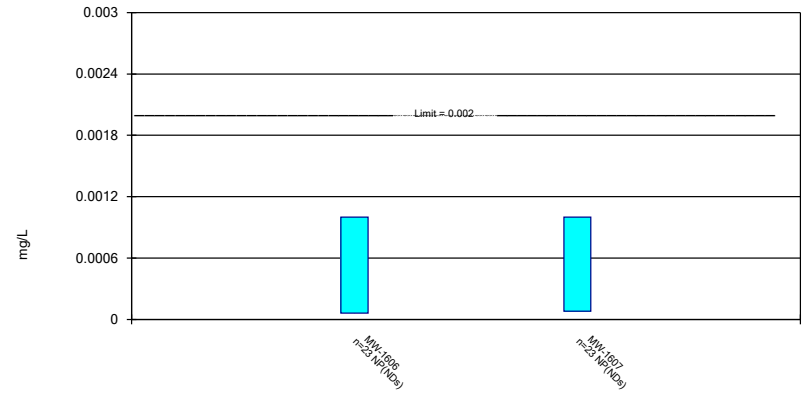
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 6/23/2023 9:54 AM View: Rome Limestone - Pond 1 Confidence In
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

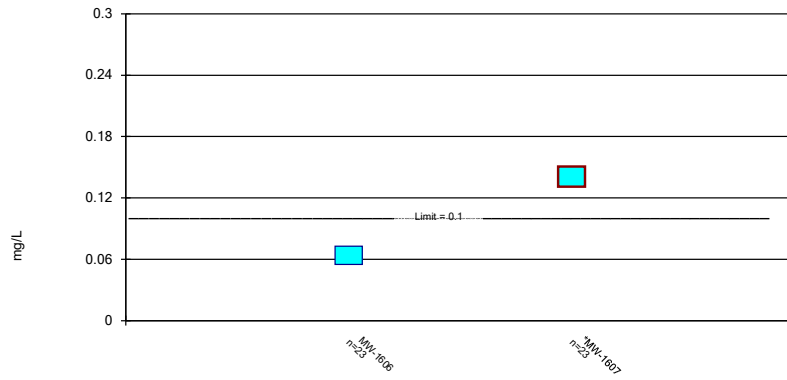
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 6/23/2023 9:54 AM View: Rome Limestone - Pond 1 Confidence I
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

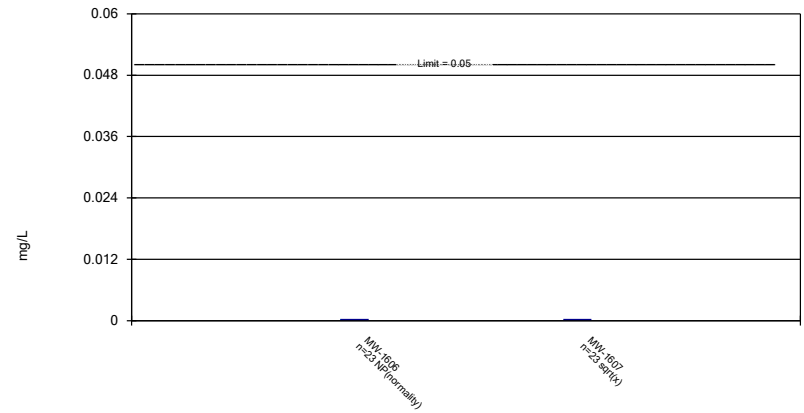
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 6/23/2023 9:54 AM View: Rome Limestone - Pond 1 Confidence Clinch River Client: AEP Data: Clinch River

Parametric and Non-Parametric (NP) Confidence Interval

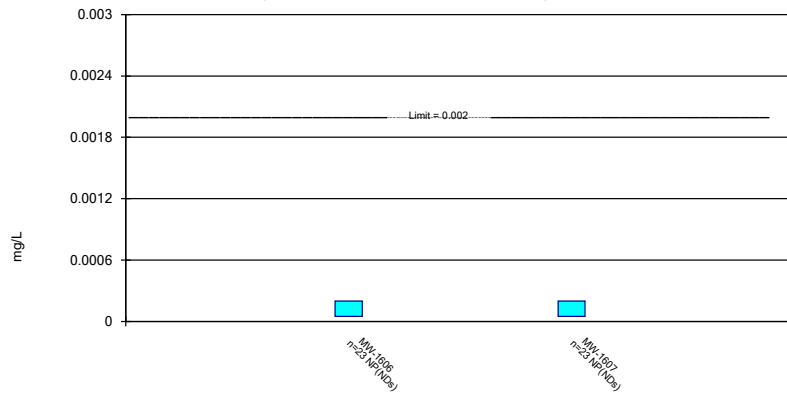
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 6/23/2023 9:54 AM View: Rome Limestone - Pond 1 Confidence Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium total Analysis Run 6/23/2023 9:54 AM View: Rome Limestone - Pond 1 Confidence Clinch River Client: AEP Data: Clinch River

Confidence Intervals - Dumps Fault - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 9/5/2023, 12:09 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Lower Compl.	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha Method
Cobalt total (mg/L)	MW-1610	0.008772	0.006382	0.006	n/a	Yes	23	0.007577	0.002284	0	None	No	0.01 Param.
Molybdenum total (mg/L)	MW-1610	0.1709	0.1196	0.1	n/a	Yes	23	0.1481	0.05395	0	None	sqrt(x)	0.01 Param.
Lithium total (mg/L)	MW-1610	0.201	0.161	0.161	n/a	Yes	23	0.184	0.0447	0	None	ln(x)	0.01 Param.

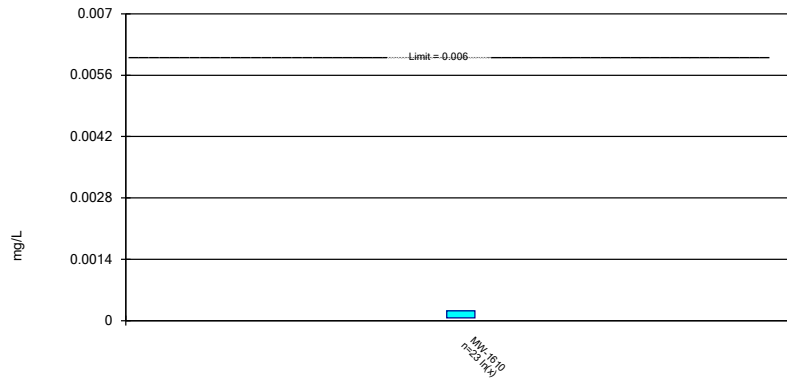
Confidence Intervals - Dumps Fault - All Results

Clinch River Client: AEP Data: Clinch River Printed 9/5/2023, 12:09 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Lower Compl.	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha Method
Antimony total (mg/L)	MW-1610	0.000221	0.00005961	0.006	n/a	No	23	0.00026	0.0004083	4.348	None	ln(x)	0.01 Param.
Arsenic total (mg/L)	MW-1610	0.00167	0.00118	0.04	n/a	No	23	0.00159	0.0009891	0	None	No	0.01 NP (normality)
Barium total (mg/L)	MW-1610	0.2708	0.2215	2	n/a	No	23	0.2461	0.04715	0	None	No	0.01 Param.
Beryllium total (mg/L)	MW-1610	0.00005	0.000007	0.004	n/a	No	23	0.00004213	0.00001755	82.61	None	No	0.01 NP (NDs)
Cadmium total (mg/L)	MW-1610	0.00001565	0.0000057080	0.005	n/a	No	23	0.00002178	0.00001221	34.78	Kaplan-Meier	sqrt(x)	0.01 Param.
Chromium total (mg/L)	MW-1610	0.000248	0.00018	0.1	n/a	No	23	0.000243	0.0001409	0	None	No	0.01 NP (normality)
Cobalt total (mg/L)	MW-1610	0.008772	0.006382	0.006	n/a	Yes	23	0.007577	0.002284	0	None	No	0.01 Param.
Combined Radium 226 and 228 (pCi/L)	MW-1610	1.508	0.8429	5	n/a	No	23	1.176	0.6362	0	None	No	0.01 Param.
Molybdenum total (mg/L)	MW-1610	0.1709	0.1196	0.1	n/a	Yes	23	0.1481	0.05395	0	None	sqrt(x)	0.01 Param.
Selenium total (mg/L)	MW-1610	0.000336	0.0001988	0.05	n/a	No	23	0.0002674	0.0001312	8.696	None	No	0.01 Param.
Thallium total (mg/L)	MW-1610	0.0002	0.00003	0.002	n/a	No	23	0.000153	0.00008087	73.91	None	No	0.01 NP (NDs)
Fluoride total (mg/L)	MW-1610	0.22	0.18	4	n/a	No	23	0.2074	0.03899	0	None	No	0.01 NP (normality)
Lead total (mg/L)	MW-1610	0.007041	0.002694	0.015	n/a	No	23	0.005507	0.004557	0	None	sqrt(x)	0.01 Param.
Lithium total (mg/L)	MW-1610	0.201	0.161	0.161	n/a	Yes	23	0.184	0.0447	0	None	ln(x)	0.01 Param.
Mercury total (mg/L)	MW-1610	0.001	0.00006	0.002	n/a	No	23	0.0009591	0.000196	95.65	None	No	0.01 NP (NDs)

Parametric Confidence Interval

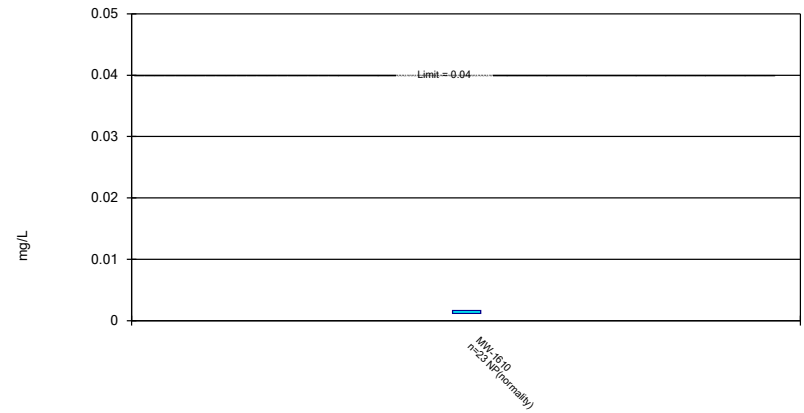
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 9/5/2023 12:03 PM View: Dumps Fault - Pond 1 Confidence Inte
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

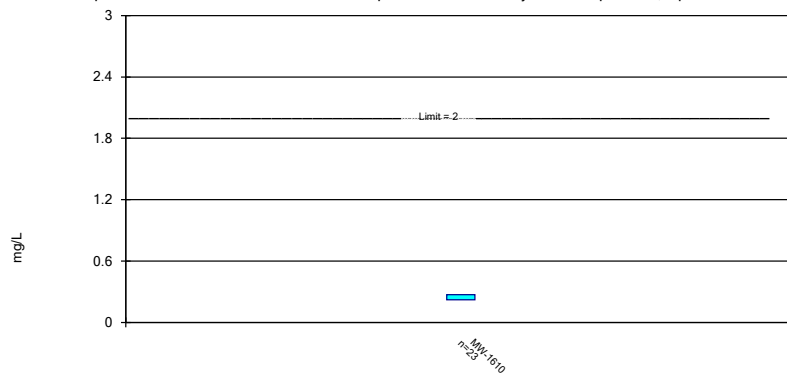
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic total Analysis Run 9/5/2023 12:03 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

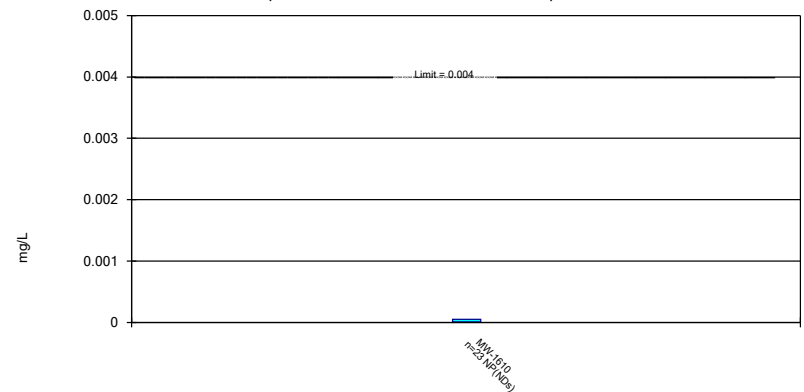
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 9/5/2023 12:03 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

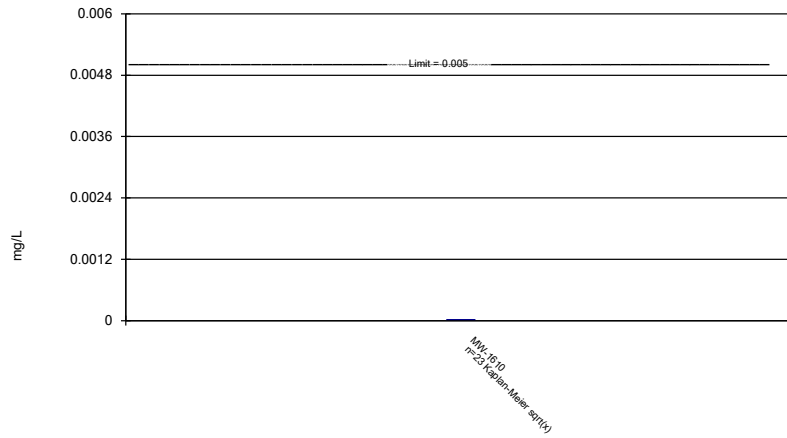
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond 1 Confidence Inte
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

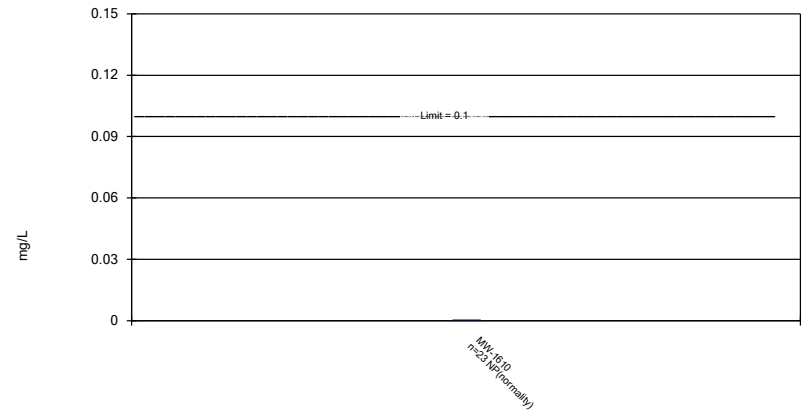
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium total Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond 1 Confidence Int
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

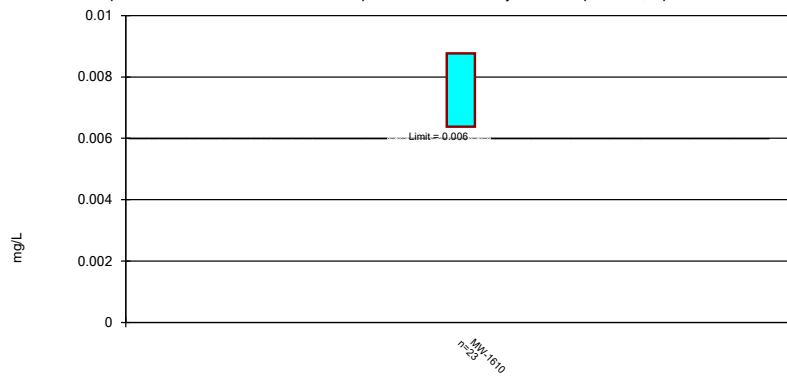
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Chromium total Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond 1 Confidence Int
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

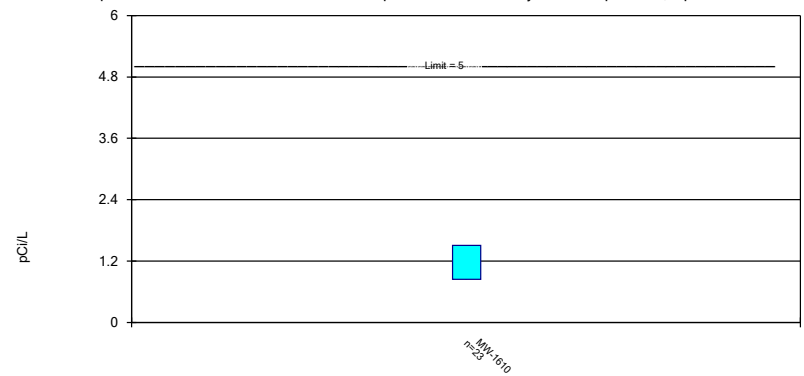
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond 1 Confidence Interva
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

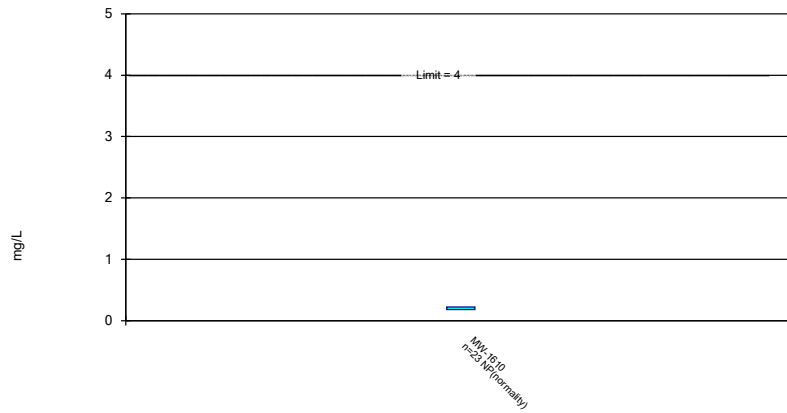
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

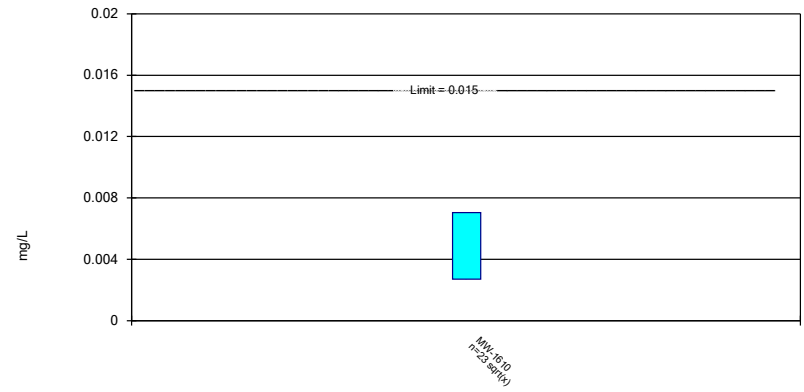
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride total Analysis Run 9/5/2023 12:05 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

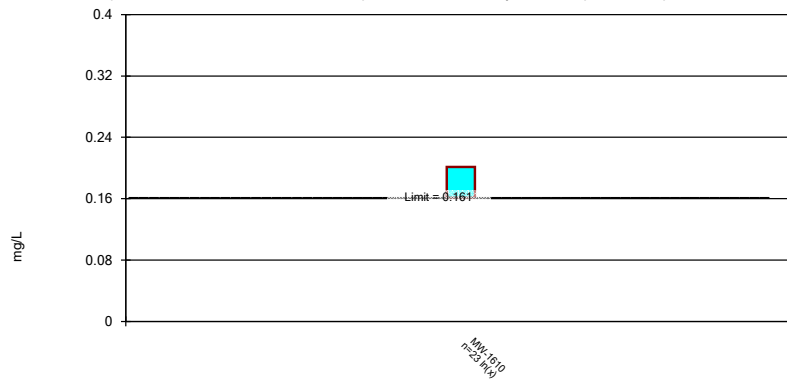
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 9/5/2023 12:05 PM View: Dumps Fault - Pond 1 Confidence Intervals
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

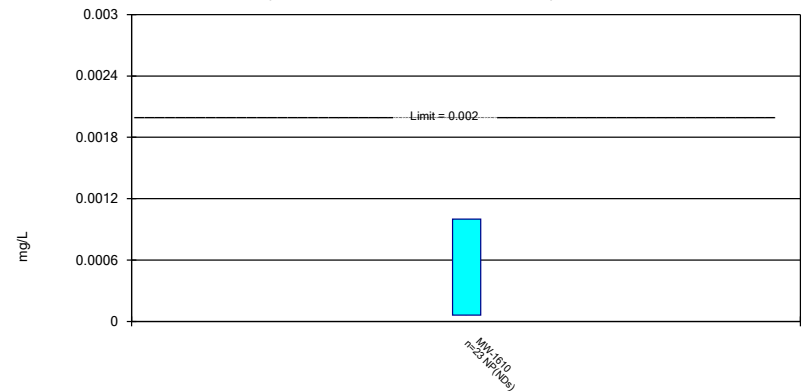
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 9/5/2023 12:06 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

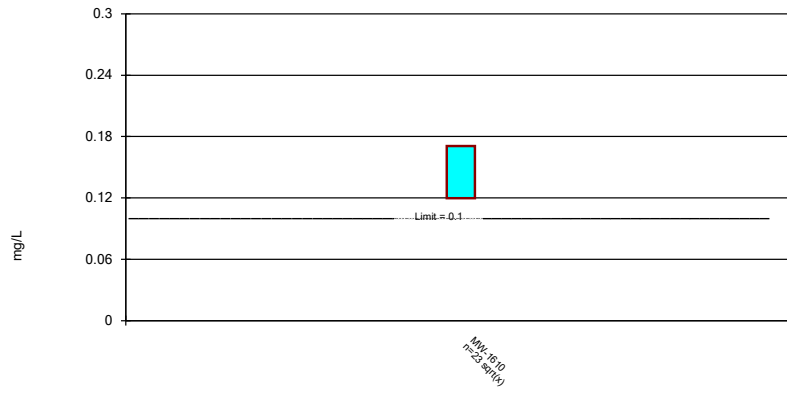
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 9/5/2023 12:07 PM View: Dumps Fault - Pond 1 Confidence Interv
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

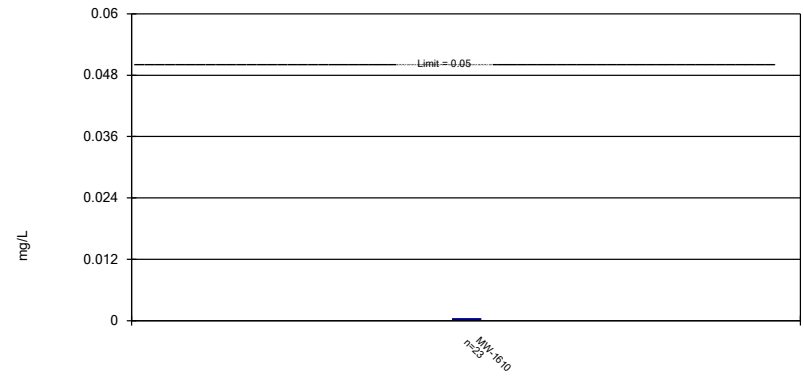
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond 1 Confidence I
Clinch River Client: AEP Data: Clinch River

Parametric Confidence Interval

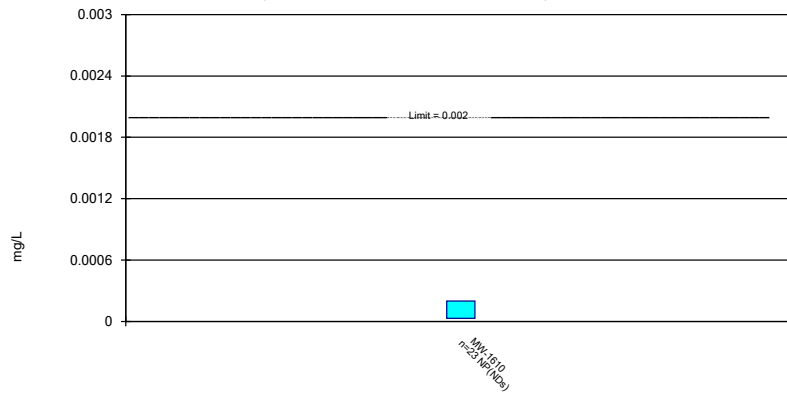
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond 1 Confidence Inte
Clinch River Client: AEP Data: Clinch River

Non-Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Thallium total Analysis Run 9/5/2023 12:04 PM View: Dumps Fault - Pond 1 Confidence Inter
Clinch River Client: AEP Data: Clinch River

FIGURE G.

Appendix IV Trend Tests - Chattanooga Shale - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:44 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Barium total (mg/L)	MW-1601 (bg)	-0.02599	-175	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1602 (bg)	-0.002596	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1603	0.1938	125	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1605	0.2227	111	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1608 (bg)	-0.003546	-207	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1612	0.1014	89	71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1602 (bg)	-0.001427	-91	-76	Yes	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1608 (bg)	-0.001146	-126	-76	Yes	23	4.348	n/a	n/a	0.05	NP

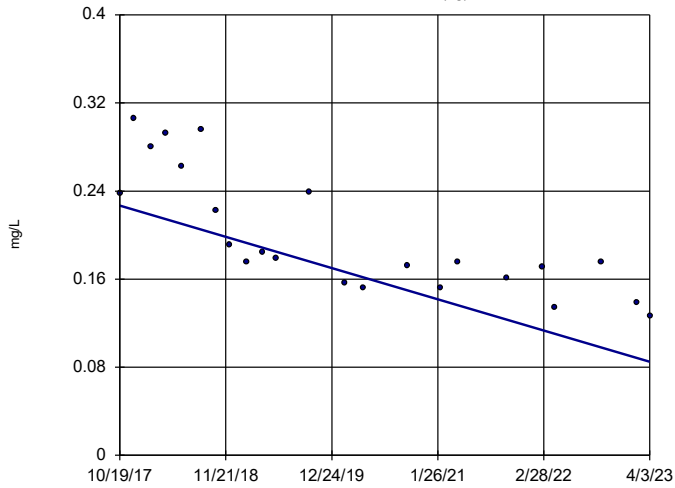
Appendix IV Trend Tests - Chattanooga Shale - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:44 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Barium total (mg/L)	MW-1601 (bg)	-0.02599	-175	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1602 (bg)	-0.002596	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1603	0.1938	125	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1604	-0.005062	-10	-76	No	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1605	0.2227	111	76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1608 (bg)	-0.003546	-207	-76	Yes	23	0	n/a	n/a	0.05	NP
Barium total (mg/L)	MW-1612	0.1014	89	71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1601 (bg)	-0.001042	-50	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1602 (bg)	-0.001427	-91	-76	Yes	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1605	-0.001563	-42	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1608 (bg)	-0.001146	-126	-76	Yes	23	4.348	n/a	n/a	0.05	NP

Sen's Slope Estimator

MW-1601 (bg)

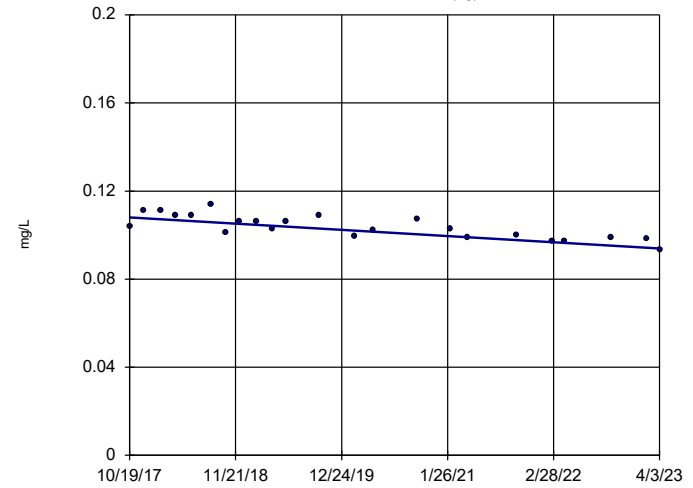


n = 23
 Slope = -0.02599
 units per year.
 Mann-Kendall
 statistic = -175
 critical = -76
 Decreasing trend
 significant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Barium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1602 (bg)

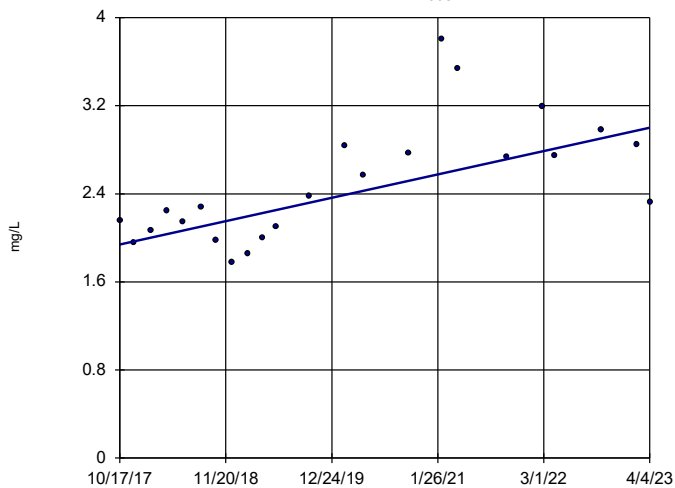


n = 23
 Slope = -0.002596
 units per year.
 Mann-Kendall
 statistic = -158
 critical = -76
 Decreasing trend
 significant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Barium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1603

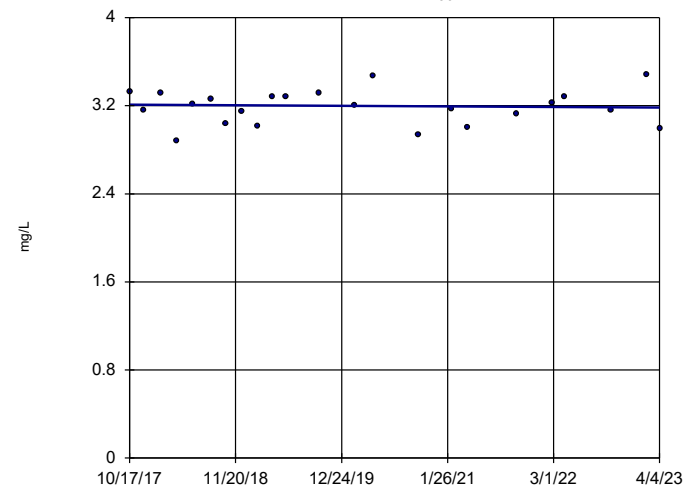


n = 23
 Slope = 0.1938
 units per year.
 Mann-Kendall
 statistic = 125
 critical = 76
 Increasing trend
 significant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Barium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1604

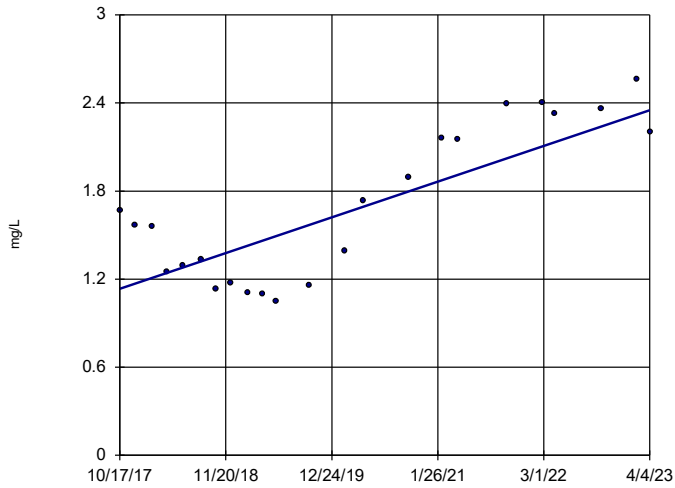


n = 23
 Slope = -0.005062
 units per year.
 Mann-Kendall
 statistic = -10
 critical = -76
 Trend not sig-
 nificant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Barium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

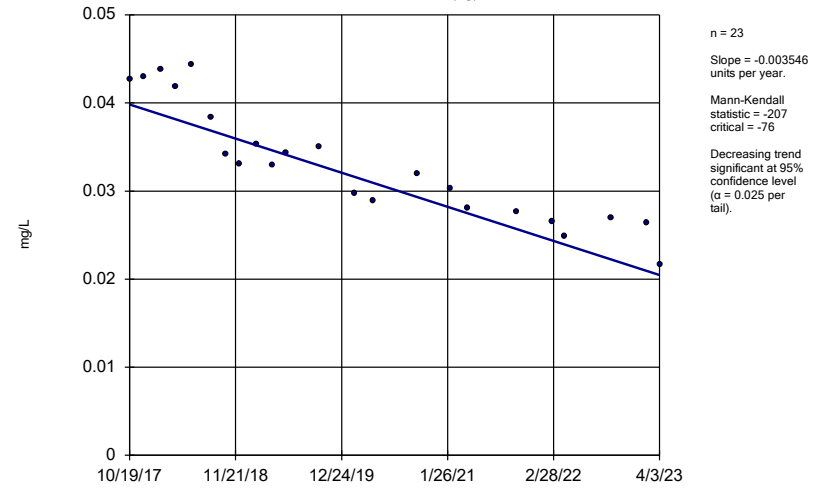
MW-1605



Constituent: Barium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix IV
Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

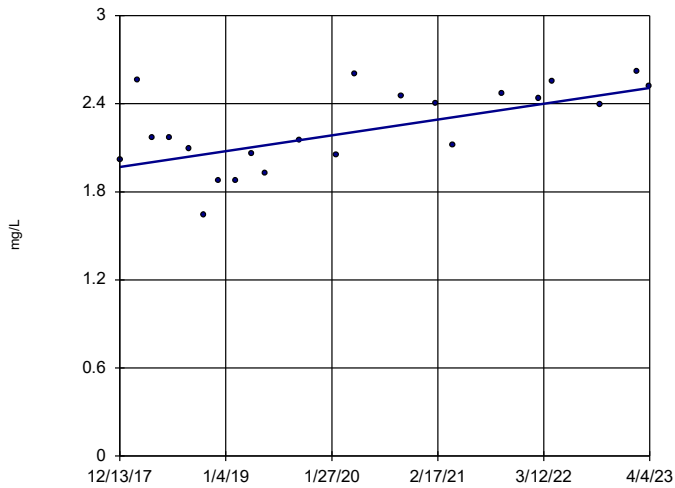
MW-1608 (bg)



Constituent: Barium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix IV
Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

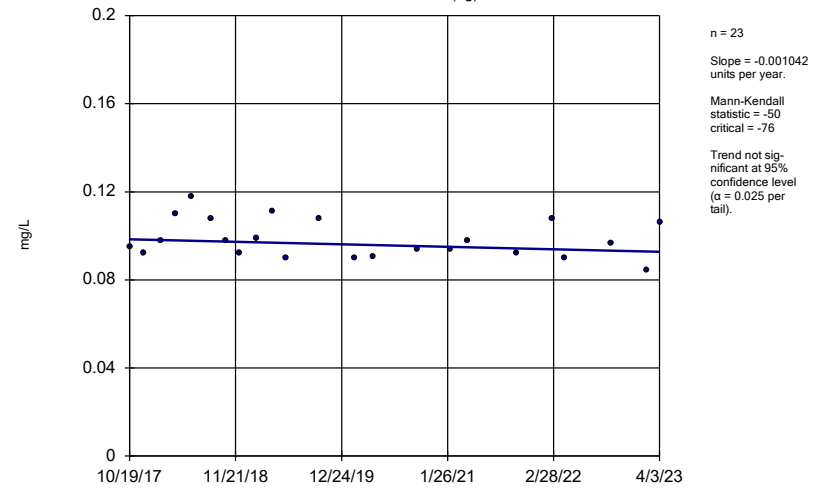
MW-1612



Constituent: Barium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix IV
Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

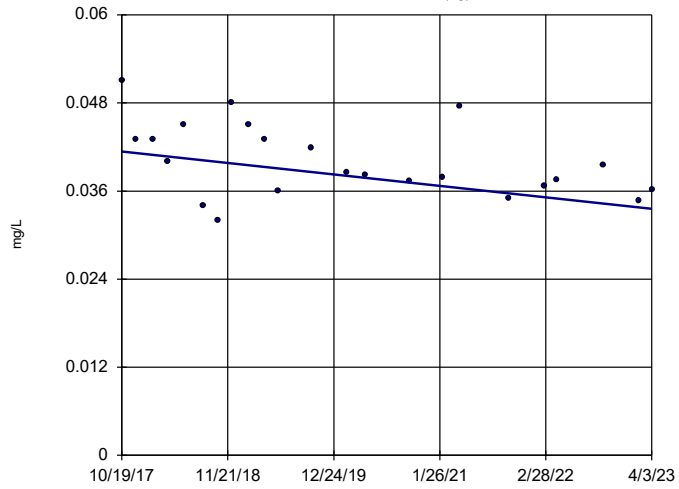
MW-1601 (bg)



Constituent: Lithium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix I
Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1602 (bg)

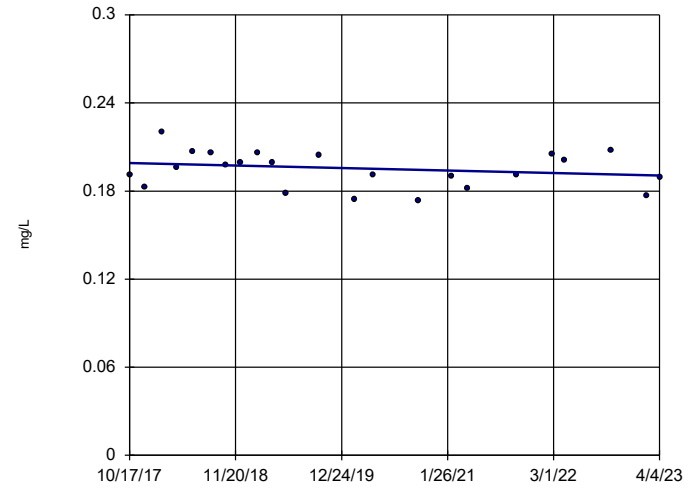


n = 23
 Slope = -0.001427
 units per year.
 Mann-Kendall
 statistic = -91
 critical = -76
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Lithium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix I
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1605

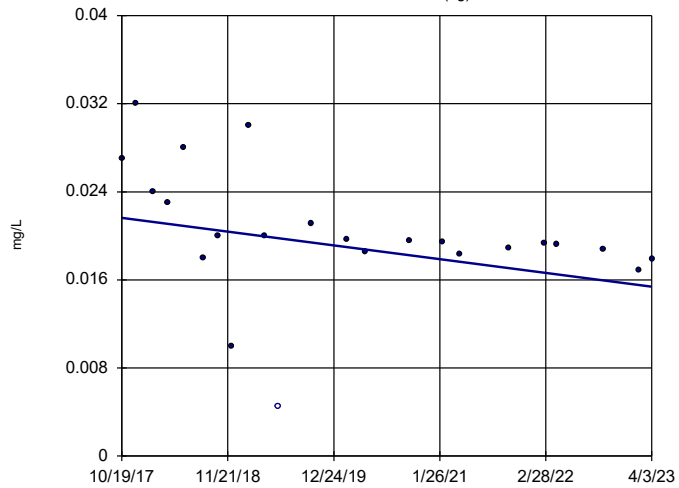


n = 23
 Slope = -0.001563
 units per year.
 Mann-Kendall
 statistic = -42
 critical = -76
 Trend not sig-
 nificant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Lithium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix I
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1608 (bg)



n = 23
 Slope = -0.001146
 units per year.
 Mann-Kendall
 statistic = -126
 critical = -76
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Lithium total Analysis Run 6/23/2023 9:43 AM View: Chattanooga Shale - Pond 1 Appendix I
 Clinch River Client: AEP Data: Clinch River

Appendix IV Trend Tests - Rome Limestone - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:35 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Lithium total (mg/L)	MW-1609 (bg)	-0.00105	-126	-76	Yes	23	26.09	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1609 (bg)	-0.0001288	-113	-76	Yes	23	21.74	n/a	n/a	0.05	NP

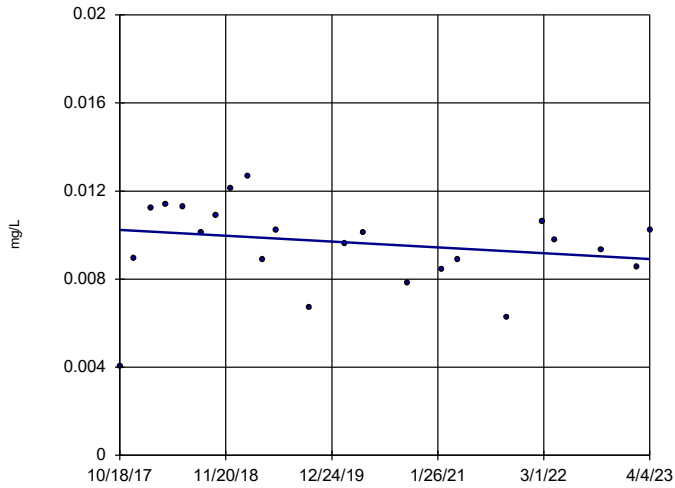
Appendix IV Trend Tests - Rome Limestone - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:35 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1607	-0.0002417	-46	-76	No	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1609 (bg)	-0.00003149	-59	-76	No	23	13.04	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1606	-0.0008913	-11	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1607	0.0006326	28	76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1609 (bg)	-0.00105	-126	-76	Yes	23	26.09	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1607	-0.004568	-67	-76	No	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1609 (bg)	-0.0001288	-113	-76	Yes	23	21.74	n/a	n/a	0.05	NP

Sen's Slope Estimator

MW-1607



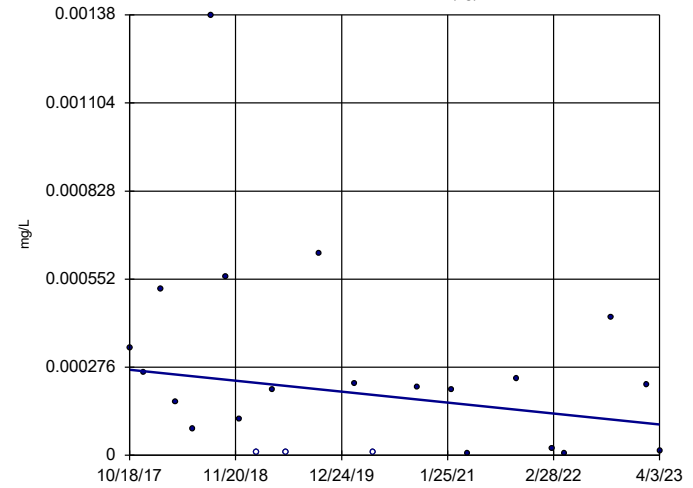
n = 23
 Slope = -0.0002417
 units per year.
 Mann-Kendall
 statistic = -46
 critical = -76
 Trend not sig-
 nificant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Cobalt total Analysis Run 6/23/2023 10:34 AM View: Rome Limestone - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

Sen's Slope Estimator

MW-1609 (bg)

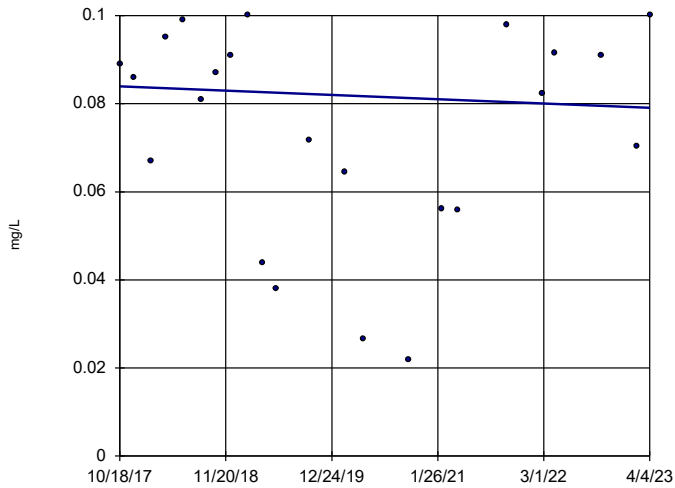


n = 23
 Slope = -0.00003149
 units per year.
 Mann-Kendall
 statistic = -59
 critical = -76
 Trend not sig-
 nificant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Cobalt total Analysis Run 6/23/2023 10:34 AM View: Rome Limestone - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1606

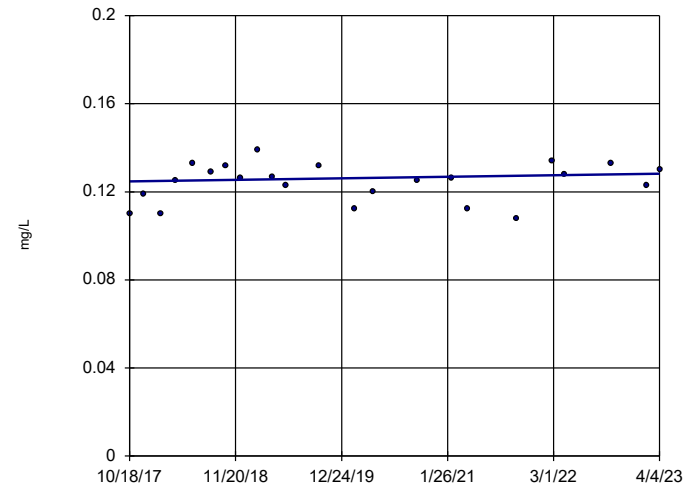


n = 23
 Slope = -0.0008913
 units per year.
 Mann-Kendall
 statistic = -11
 critical = -76
 Trend not sig-
 nificant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Lithium total Analysis Run 6/23/2023 10:34 AM View: Rome Limestone - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1607

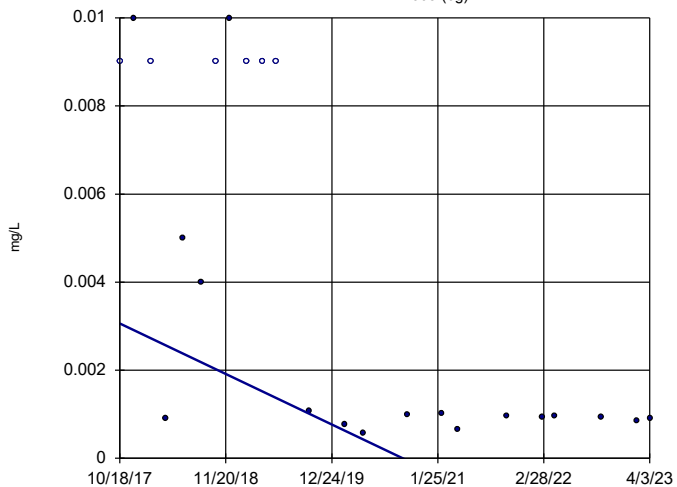


n = 23
 Slope = 0.0006326
 units per year.
 Mann-Kendall
 statistic = 28
 critical = 76
 Trend not sig-
 nificant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Lithium total Analysis Run 6/23/2023 10:34 AM View: Rome Limestone - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1609 (bg)

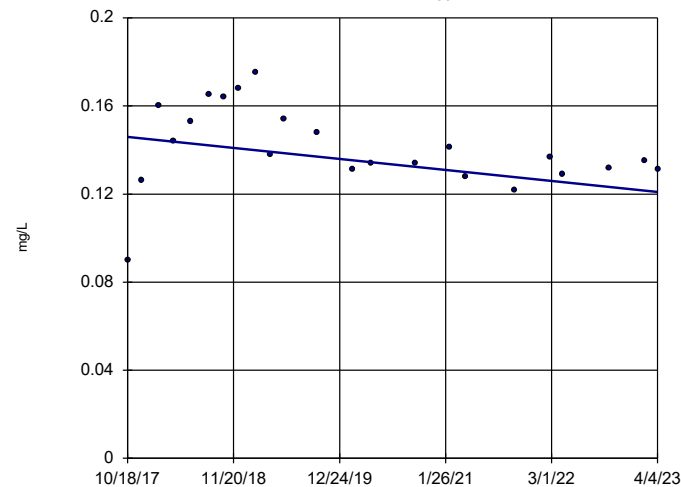


n = 23
Slope = -0.00105
units per year.
Mann-Kendall
statistic = -126
critical = -76
Decreasing trend
significant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Lithium total Analysis Run 6/23/2023 10:34 AM View: Rome Limestone - Pond 1 Appendix IV
Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1607

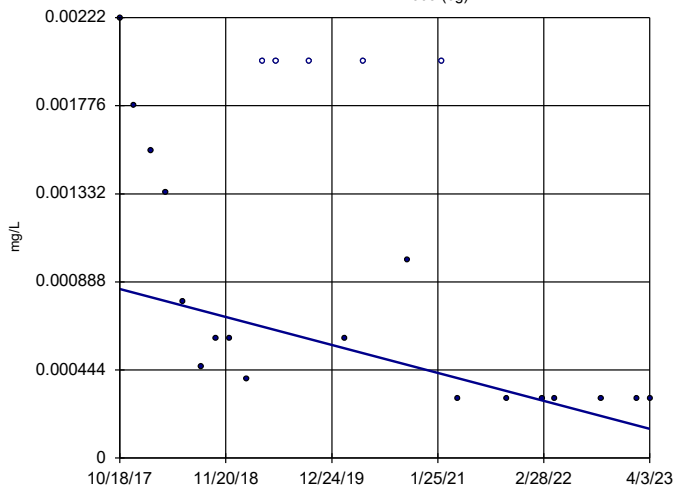


n = 23
Slope = -0.004568
units per year.
Mann-Kendall
statistic = -67
critical = -76
Trend not sig-
nificant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Molybdenum total Analysis Run 6/23/2023 10:34 AM View: Rome Limestone - Pond 1 Appen
Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1609 (bg)



n = 23
Slope = -0.0001288
units per year.
Mann-Kendall
statistic = -113
critical = -76
Decreasing trend
significant at 95%
confidence level
($\alpha = 0.025$ per
tail).

Constituent: Molybdenum total Analysis Run 6/23/2023 10:34 AM View: Rome Limestone - Pond 1 Appen
Clinch River Client: AEP Data: Clinch River

Appendix IV Trend Tests - Dumps Fault - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:52 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1610	-0.001134	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.00001662	-198	-71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1611 (bg)	-0.009376	-181	-76	Yes	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1611 (bg)	-0.0001732	-100	-71	Yes	22	0	n/a	n/a	0.05	NP

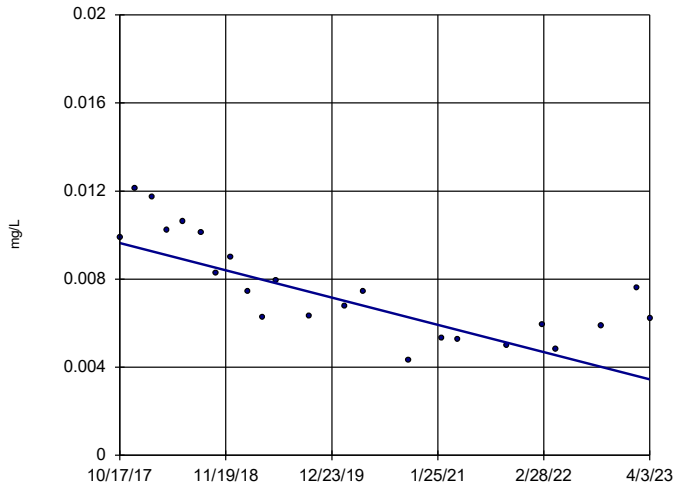
Appendix IV Trend Tests - Dumps Fault - All Results

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 10:52 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt total (mg/L)	MW-1610	-0.001134	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.0001662	-198	-71	Yes	22	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1610	-0.003519	-27	-76	No	23	0	n/a	n/a	0.05	NP
Lithium total (mg/L)	MW-1611 (bg)	-0.009376	-181	-76	Yes	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1610	-0.00943	-56	-76	No	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1611 (bg)	-0.0001732	-100	-71	Yes	22	0	n/a	n/a	0.05	NP

Sen's Slope Estimator

MW-1610

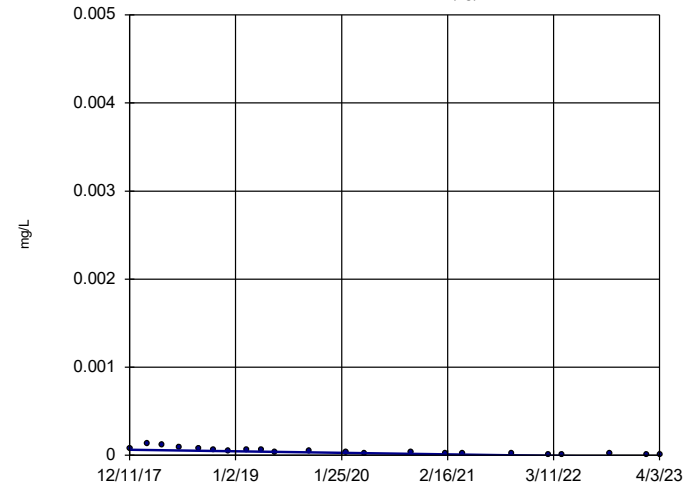


n = 23
 Slope = -0.001134 units per year.
 Mann-Kendall statistic = -158
 critical = -76
 Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt total Analysis Run 6/23/2023 10:50 AM View: Dumps Fault - Pond 1 Appendix IV Tren
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1611 (bg)

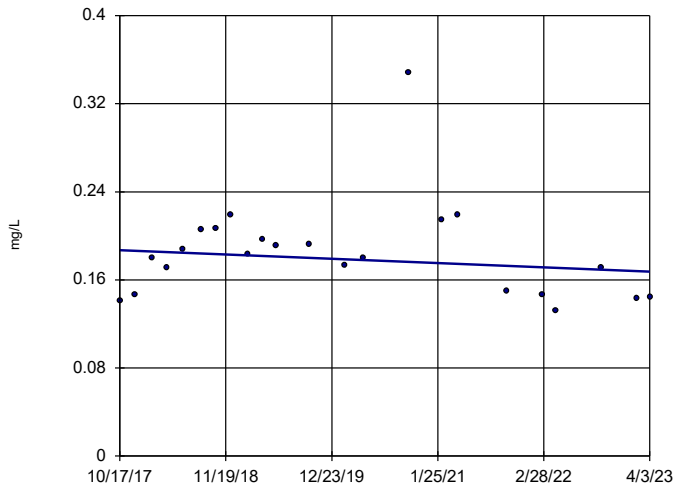


n = 22
 Slope = -0.00001662 units per year.
 Mann-Kendall statistic = -198
 critical = -71
 Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Cobalt total Analysis Run 6/23/2023 10:50 AM View: Dumps Fault - Pond 1 Appendix IV Tren
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1610

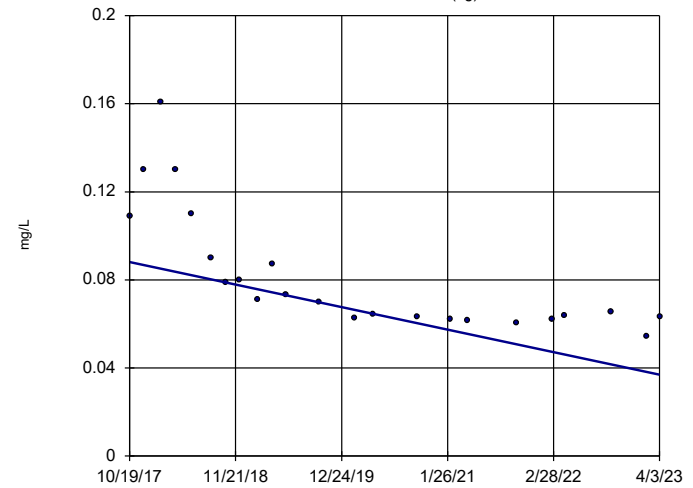


n = 23
 Slope = -0.003519 units per year.
 Mann-Kendall statistic = -27
 critical = -76
 Trend not significant at 95% confidence level (α = 0.025 per tail).

Constituent: Lithium total Analysis Run 6/23/2023 10:50 AM View: Dumps Fault - Pond 1 Appendix IV Tre
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1611 (bg)

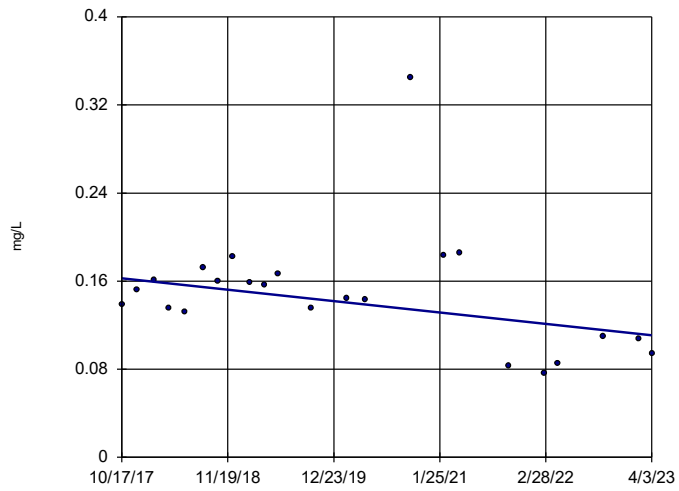


n = 23
 Slope = -0.009376 units per year.
 Mann-Kendall statistic = -181
 critical = -76
 Decreasing trend significant at 95% confidence level (α = 0.025 per tail).

Constituent: Lithium total Analysis Run 6/23/2023 10:50 AM View: Dumps Fault - Pond 1 Appendix IV Tre
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1610



n = 23
 Slope = -0.00943
 units per year.
 Mann-Kendall
 statistic = -56
 critical = -76
 Trend not sig-
 nificant at 95%
 confidence level
 (α = 0.025 per
 tail).

Constituent: Molybdenum total Analysis Run 6/23/2023 10:50 AM View: Dumps Fault - Pond 1 Appendix I
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1611 (bg)

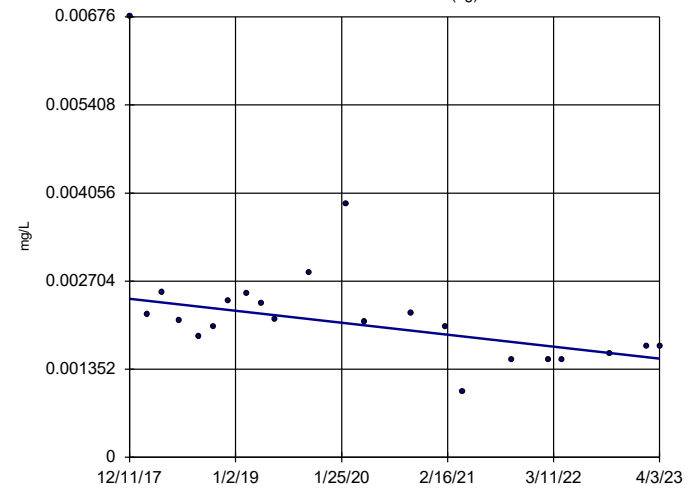


FIGURE H.

Confidence Interval (Most Recent 8) - Chattanooga Shale - Barium MW-1605

Clinch River Client: AEP Data: Clinch River Printed 6/23/2023, 9:42 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Barium total (mg/L)	MW-1605	2.468	2.169	2	Yes	8	2.319	0.1412	0	None	No	0.01	Param.

Appendix IV Trend Tests - Dumps Fault - Significant Results

Clinch River Client: AEP Data: Clinch River Printed 9/5/2023, 12:21 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt total (mg/L)	MW-1610	-0.001134	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.00001662	-198	-71	Yes	22	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1611 (bg)	-0.0001732	-100	-71	Yes	22	0	n/a	n/a	0.05	NP

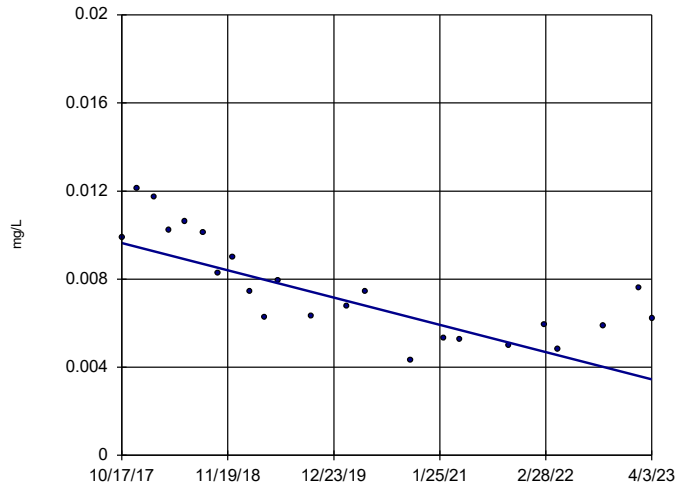
Appendix IV Trend Tests - Dumps Fault - All Results

Clinch River Client: AEP Data: Clinch River Printed 9/5/2023, 12:21 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt total (mg/L)	MW-1610	-0.001134	-158	-76	Yes	23	0	n/a	n/a	0.05	NP
Cobalt total (mg/L)	MW-1611 (bg)	-0.0001662	-198	-71	Yes	22	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1610	-0.00943	-56	-76	No	23	0	n/a	n/a	0.05	NP
Molybdenum total (mg/L)	MW-1611 (bg)	-0.0001732	-100	-71	Yes	22	0	n/a	n/a	0.05	NP

Sen's Slope Estimator

MW-1610

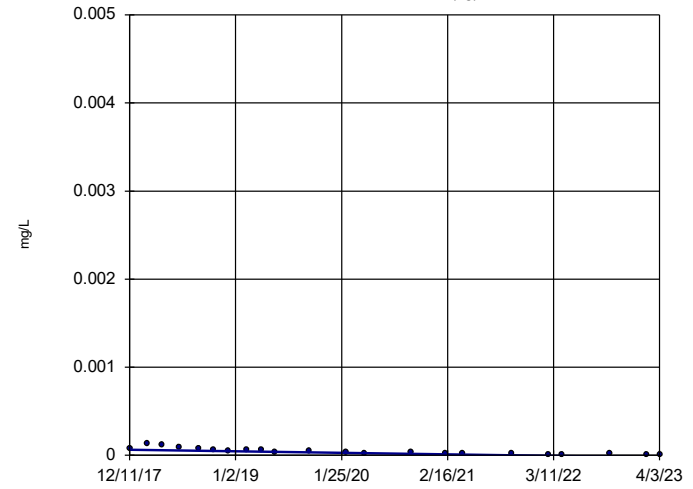


n = 23
 Slope = -0.001134
 units per year.
 Mann-Kendall
 statistic = -158
 critical = -76
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Cobalt total Analysis Run 9/5/2023 12:19 PM View: Dumps Fault - Pond 1 Appendix IV Trend
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1611 (bg)

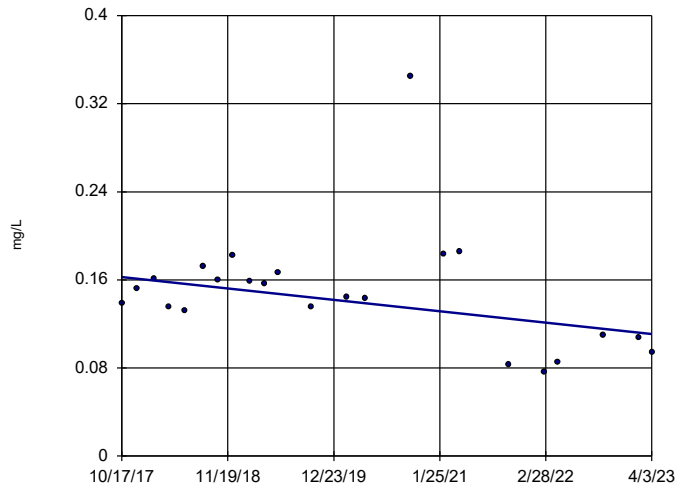


n = 22
 Slope = -0.00001662
 units per year.
 Mann-Kendall
 statistic = -198
 critical = -71
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Cobalt total Analysis Run 9/5/2023 12:19 PM View: Dumps Fault - Pond 1 Appendix IV Trend
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1610

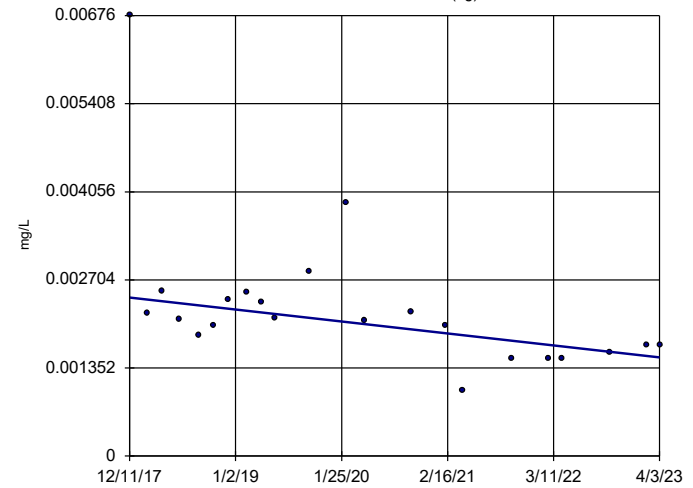


n = 23
 Slope = -0.00943
 units per year.
 Mann-Kendall
 statistic = -56
 critical = -76
 Trend not sig-
 nificant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Molybdenum total Analysis Run 9/5/2023 12:19 PM View: Dumps Fault - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

Sen's Slope Estimator

MW-1611 (bg)



n = 22
 Slope = -0.0001732
 units per year.
 Mann-Kendall
 statistic = -100
 critical = -71
 Decreasing trend
 significant at 95%
 confidence level
 ($\alpha = 0.025$ per
 tail).

Constituent: Molybdenum total Analysis Run 9/5/2023 12:19 PM View: Dumps Fault - Pond 1 Appendix IV
 Clinch River Client: AEP Data: Clinch River

APPENDIX 3 – Alternate Source Demonstrations

No new alternate source demonstrations have been completed as of January 31, 2024.

APPENDIX 4 – Notices for Monitoring Program Transitions

The notification that an assessment monitoring program and assessment of corrective measure was initiated follows.

Clinch River Plant
Notice of Assessment Monitoring Program Establishment
Pond 1 CCR Management Unit

On July 15, 2019, it was determined that Clinch River Plant's Pond 1 had statistically significant increases over background for calcium, chloride and sulfate and a statistically significant decrease for pH.

Clinch River Pond 1 was officially closed on August 6, 2018 under a Solid Waste Permit issued by Virginia Department of Environmental Quality. The State solid waste permit included a groundwater monitoring program that required the groundwater to be sampled and analyzed for Appendix III, Appendix IV and additional State parameters immediately following the collection of background. Under the State statistical methods, the statistical analysis of the first compliance sampling event indicated statistical significant increases above groundwater protection standards for cobalt, lithium, molybdenum, nickel, lead and barium. Nickel and lead are State-only parameters.

Based on the results of the State statistical analysis, Appalachian Power Company made the decision to statistically evaluate Appendix IV parameters during the first Federal CCR detection monitoring event. This evaluation following Federal statistical analysis methods, indicated statistical significant increases above groundwater protection standards for barium, cobalt, lithium and molybdenum. This evaluation can be found as Appendix 2 of the Annual Groundwater Report dated August 1, 2019.

At this point, no alternate source demonstration (ASD) for Appendix III parameters will be completed in accordance with §257.94(e)(2), prompting the initiation of an assessment monitoring program, which was established on July 15, 2019. Therefore this notice is being placed in the operating record in accordance with the requirement of 257.94(e)(3). If a successful ASD is completed for the Appendix IV exceedances then an ASD will be completed for the Appendix III parameters.

Clinch River Plant

Notice for Initiating an Assessment of Corrective Measures

CCR Unit – Pond 1

This notice is being provided, as required by 40 CFR 257.95(g)(5), that an Assessment of Corrective Measures was initiated on October 13, 2019 for Clinch River Plant's Pond 1 due to the statistically significant concentrations detected above the established groundwater protection standards for cobalt, lithium, molybdenum and barium.

APPENDIX 5 – Well Installation/Decommissioning Logs

No wells were installed during this reporting period.