

# Annual Groundwater Monitoring and Corrective Action Report

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

**January 31, 2023**

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An **AEP** Company

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BOUNDLESS ENERGY<sup>SM</sup>

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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. The second annual report was prepared on January 31, 2020 to cover the 2019 activities, and future reports will be submitted annually on January 31<sup>st</sup>. This report is being prepared by January 31, 2023 to cover groundwater monitoring activities in 2022.

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, 2022 and July 18, 2022. A remedy has not yet been selected, or initiated.
- Data and statistical analysis not available from the previous reporting period indicates that during the October 2021 sampling event:
  - The following Appendix IV parameters exceeded the groundwater protection standards:
    - Barium at wells MW-1603 and MW-1604
    - Cobalt in wells MW-1607 and MW-1610
    - 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

- Fluoride at well MW-1604
  - Sulfate at wells MW-1606 and MW-1607
  - pH at wells MW-1603, MW-1604, and MW-1612
- During the April 2022 semi-annual sampling event
  - The following Appendix IV parameters exceeded established groundwater protection standards:
    - Barium at wells MW-1603, MW-1604, and MW-1612
    - Cobalt in wells MW-1607 and MW-1610
    - 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, MW-1604, MW-1605, and MW-1612
- The October 2022 data are still undergoing statistical analysis.

The major components of this annual report, to the extent applicable at this time, 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 such as alternate source demonstration or assessment of corrective measures, 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, viewable on the AEP CCR web site, 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 only 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 are included in **Appendix 5** of this 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 2022 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 2021 sampling event:
  - The following Appendix IV parameters exceeded the groundwater protection standards:
    - Barium at wells MW-1603 and MW-1604
    - Cobalt in wells MW-1607 and MW-1610
    - 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
  - Fluoride at well MW-1604
  - Sulfate at wells MW-1606 and MW-1607
  - pH at wells MW-1603, MW-1604, and MW-1612
- During the April 2022 semi-annual sampling event
  - The following Appendix IV parameters exceeded established groundwater protection standards:
    - Barium at wells MW-1603, MW-1604, and MW-1612
    - Cobalt in wells MW-1607 and MW-1610
    - 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, MW-1604, MW-1605, and MW-1612
- The October 2022 data are still undergoing statistical analysis.

**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 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 have been prepared. 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 and corrective action 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 2022.

**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 2023 include:

- Complete the statistical evaluation of the second semi-annual groundwater monitoring event that took place in October 2022.
- 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 alternatives.
- Responding to any new data received in light of CCR rule requirements.
- Preparation of the next annual groundwater report.

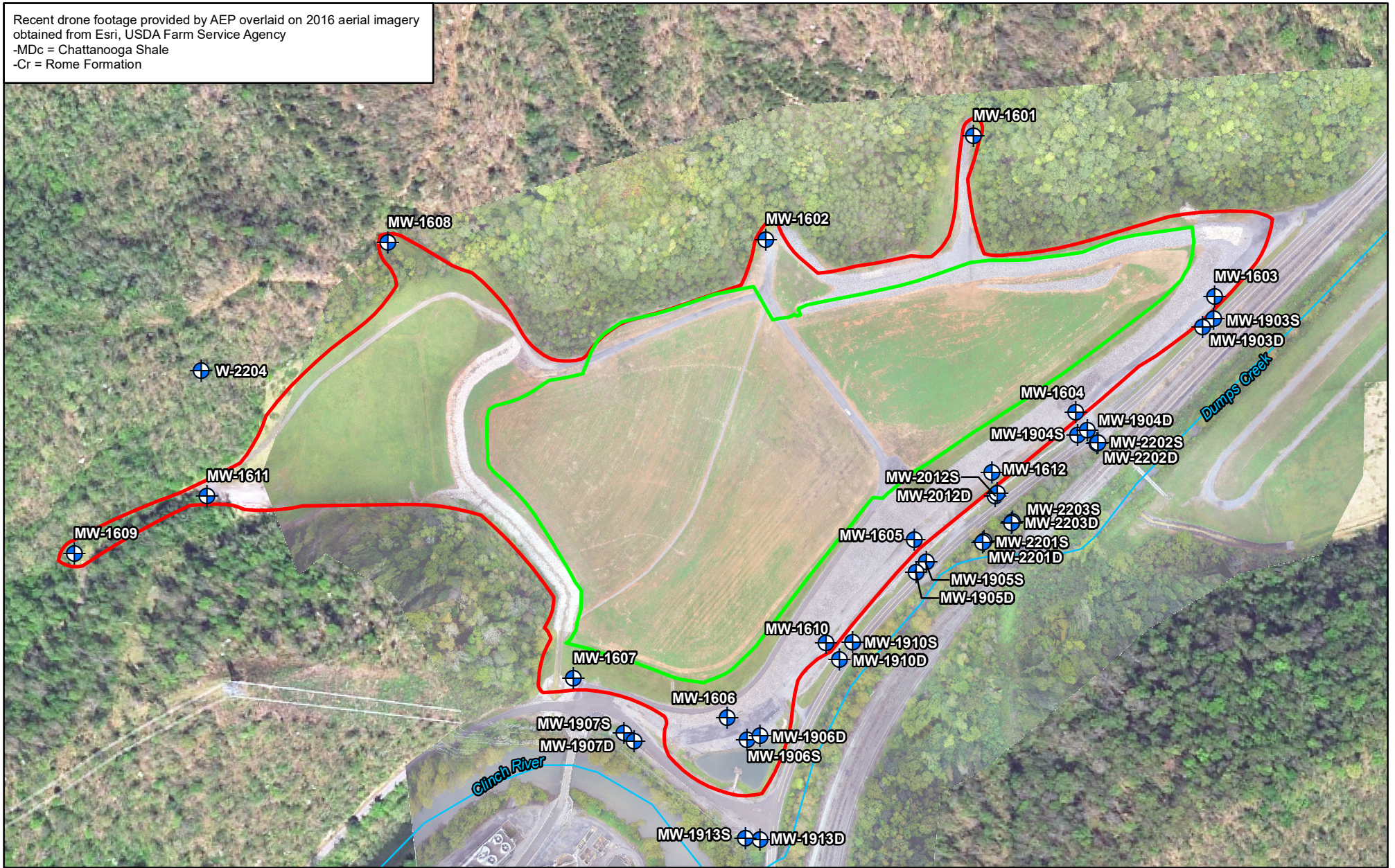
## **APPENDIX 1 – Groundwater Data Tables and Figures**

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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

**Table 1 - Groundwater Data Summary: MW-1602  
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	0.654	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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

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



**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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	2.8	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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

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

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.



**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

## Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

&lt;: 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.

- -: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

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

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

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

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

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



**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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	7.54	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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.



**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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.

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	0.3	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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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



**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

H2: Sample analysis performed past holding time.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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.



**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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.

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

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

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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

--: Not analyzed

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.

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

- -: Not analyzed

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.

**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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

**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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.



**Table 1 - Groundwater Data Summary: W-2201S  
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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

**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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

&lt;: 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.

- -: Not analyzed

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.

**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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.

**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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

H2: Sample analysis performed past holding time.

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

**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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.

**Table 1 - Groundwater Data Summary: W-2203S  
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

Notes:

mg/L: milligrams per liter

SU: standard unit

<: 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.

--: Not analyzed

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.

**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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

<: 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.

- -: Not analyzed

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.



**Table 1 - Groundwater Data Summary: W-2204***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
10/3/2022	Assessment	0.050	116	15.2	0.14	6.4	211	870

Notes:

mg/L: milligrams per liter

SU: standard unit

&lt;: 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.

- -: Not analyzed

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.

**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

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

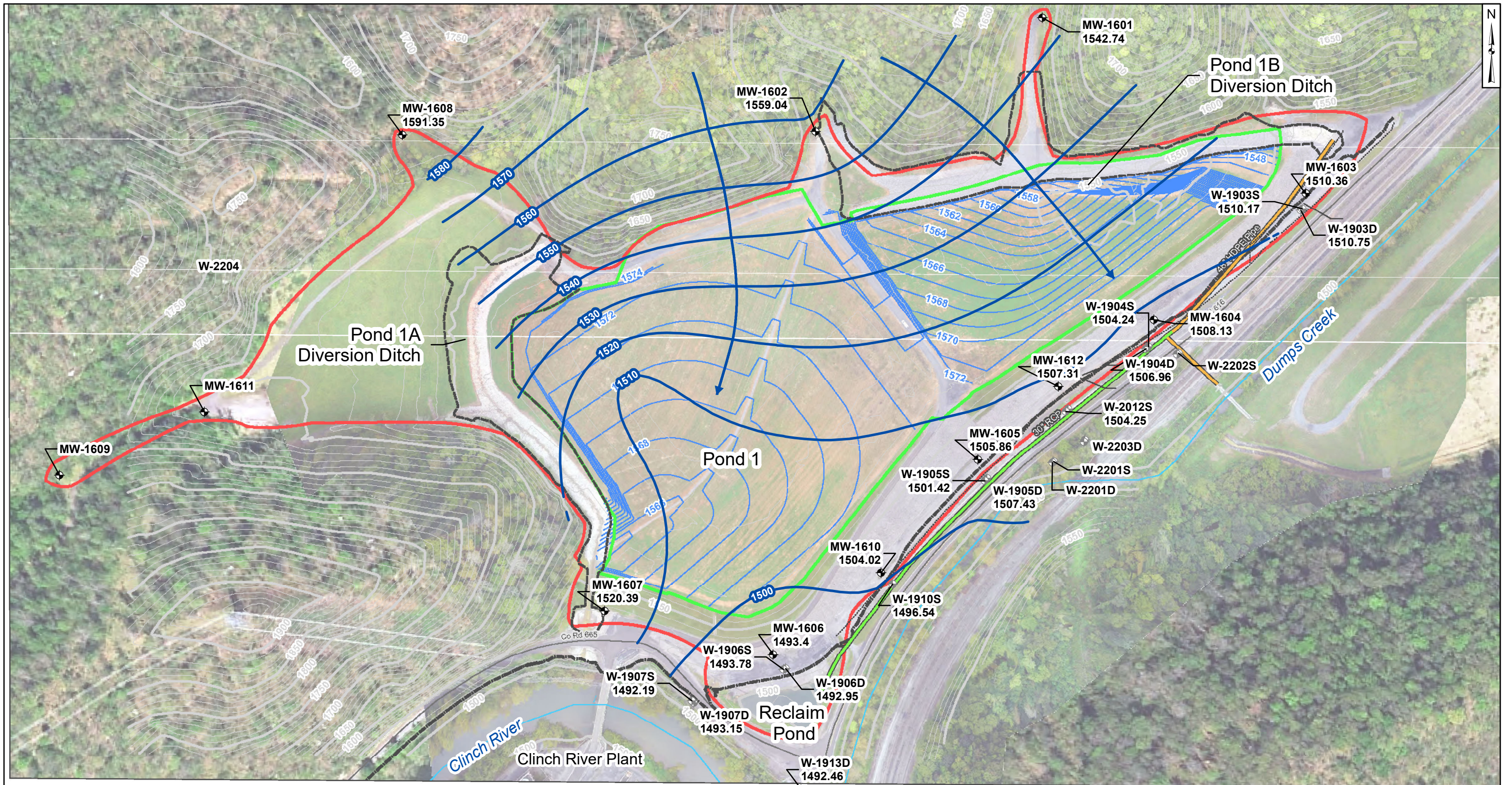
<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag. In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.

- -: Not analyzed

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.

## **Groundwater Flow Direction Maps**

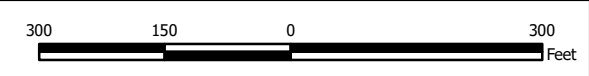




- Legend**
- ⊕ Groundwater Monitoring Well
  - ⊕ Nature and Extent Well
  - Groundwater Elevation Contour
  - Groundwater Flow Direction
  - Post-Closure Topographic Elevation
  - - - 100 yr Flood Elevation Approx. 1505 ft amsl
  - - - Diversion Ditch
  - ▭ Facility Boundary
  - ▭ Pond 1 CCR Unit Boundary

**Notes**

- Monitoring well coordinates and water level data (collected on February 22, 2022) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015) provided by AEP.
- Aerial basemap provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- MW-1609 (1661.15 ft amsl) is not included in the contouring. It is a background cross-gradient monitoring well screened in the Rome Formation.
- MW-1611 (1540.61 ft amsl) is not included in the contouring. It is a special condition background monitoring well screened across the Dumps Fault to monitor potential lateral migration of groundwater.



**Potentiometric Surface Map - Uppermost Aquifer**  
**February 2022**

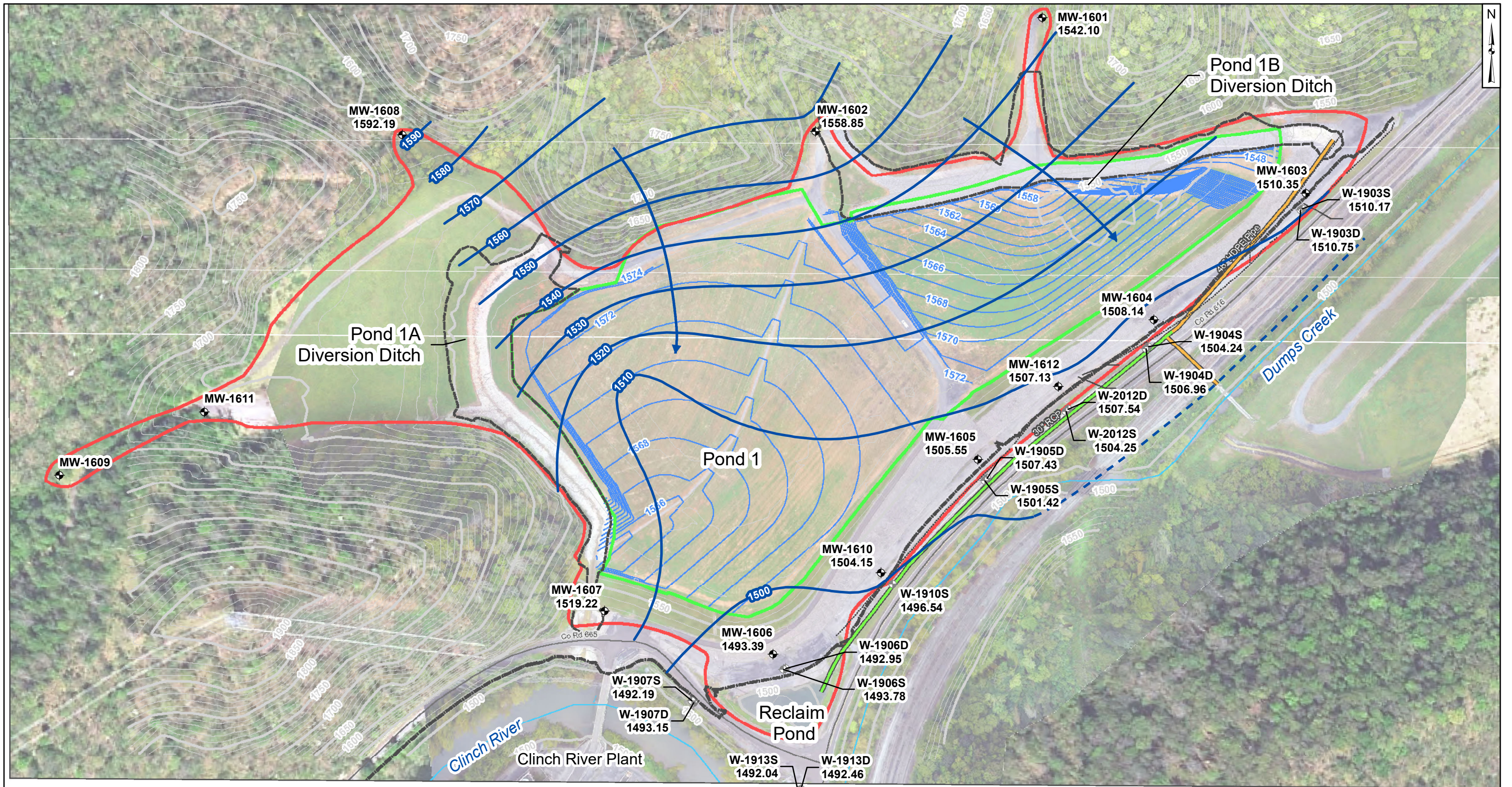
AEP Clinch River Plant - Bottom Ash Pond  
 Carbo, Virginia

**Geosyntec**  
 consultants

Ann Arbor, Michigan      2023/01/27

**Figure X**

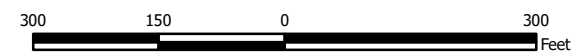




- Legend**
- Groundwater Monitoring Well
  - Nature and Extent Well
  - Groundwater Elevation Contour
  - Groundwater Flow Direction
  - Groundwater Elevation Contour (Inferred)
  - Post-Closure Topographic Elevation
  - 100 yr Flood Elevation Approx. 1505 ft amsl
  - Diversion Ditch
  - Facility Boundary
  - Pond 1 CCR Unit Boundary

**Notes**

- Monitoring well coordinates and water level data (collected on April 1, 2022) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015) provided by AEP.
- Aerial basemap provided by AEP.
- Groundwater elevation units and Post-Closure Pond Topographic units are feet above mean sea level (ft amsl).
- MW-1609 (1659.43 ft amsl) is not included in the contouring. It is a background cross-gradient monitoring well screened in the Rome Formation.
- MW-1611 (1526.67 ft amsl) is not included in the contouring. It is a special condition background monitoring well screened across the Dumps Fault to monitor potential lateral migration of groundwater.



**Potentiometric Surface Map - Uppermost Aquifer  
April 2022**

AEP Clinch River Plant - Bottom Ash Pond  
Carbo, Virginia

**Geosyntec**  
consultants

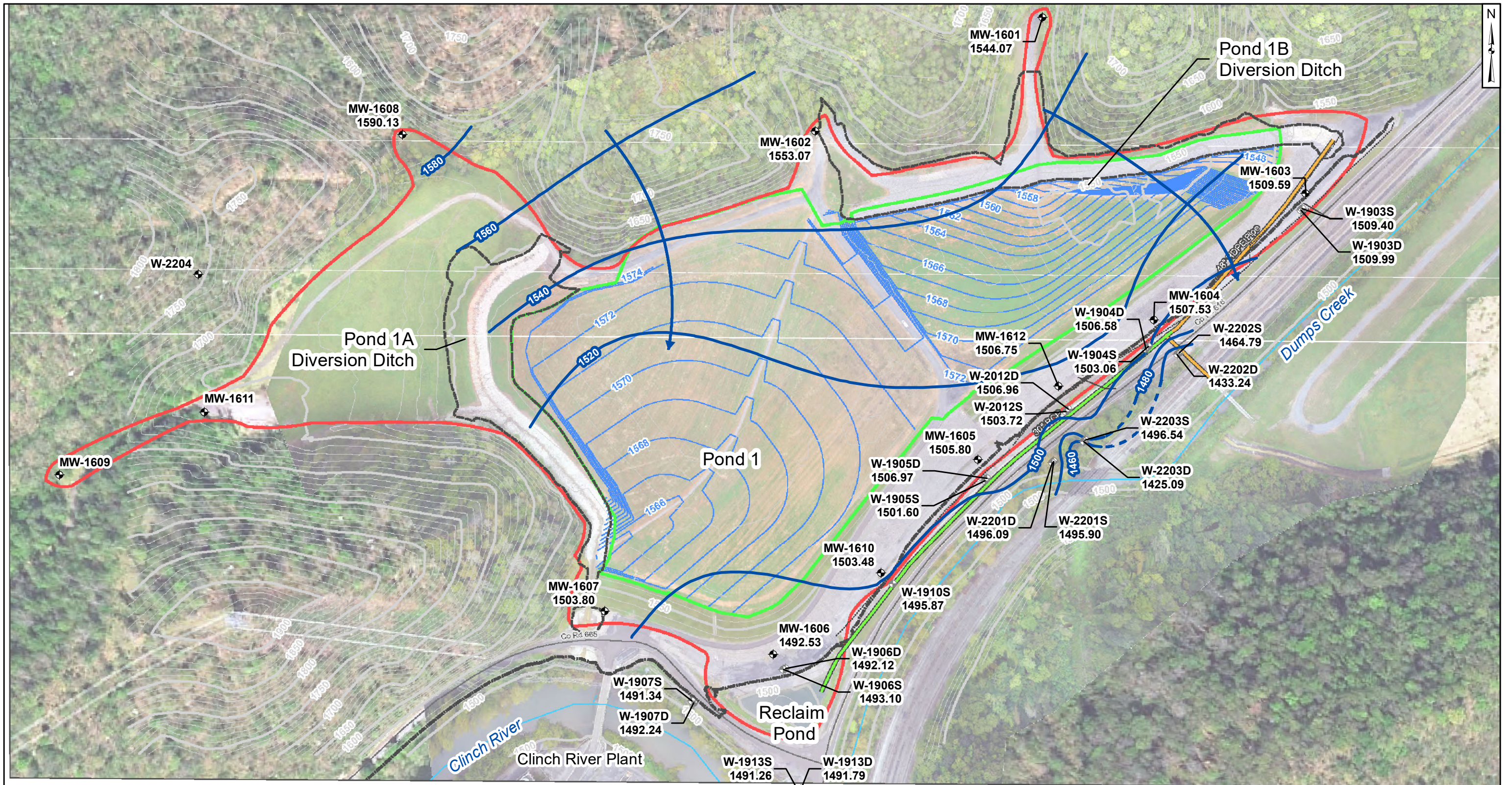
Ann Arbor, Michigan

2022/07/29

Figure

**X**

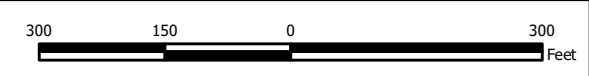




- Legend**
- ◆ Groundwater Monitoring Well; Background
  - ◆ Nature and Extent Well
  - Groundwater Elevation Contour
  - Groundwater Flow Direction
  - Groundwater Elevation Contour (Inferred)
  - Post-Closure Topographic Elevation
  - 100 yr Flood Elevation Approx. 1505 ft amsl
  - Diversion Ditch
  - Facility Boundary
  - Pond 1 CCR Unit Boundary

**Notes**

- Monitoring well coordinates and water level data (collected on October 3, 2022) provided by AEP.
- Site features based on information available in Groundwater Monitoring Network Evaluation (Amec, 2015) provided by AEP.
- Aerial basemap 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.
- MW-1609 (1655.56 ft amsl) was not included in the contouring as it is a background, cross-gradient monitoring well screened in the Rome Formation.
- Wells MW-1611 (1539.78 ft amsl) and W-2204 (1696.79 ft amsl) were not included in the contouring as they are special condition background monitoring wells screened across the Dumps Fault to monitor potential lateral migration of groundwater.



<b>Potentiometric Surface Map - Uppermost Aquifer October 2022</b>	
AEP Clinch River Plant - Bottom Ash Pond Carbo, Virginia	
Ann Arbor, Michigan	2023/01/06

Figure  
**X**



## **Groundwater Flow Velocity Calculations**

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

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2022-02		2022-04		2022-10	
			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 <sup>[1]</sup>	2.0	164	0.4	160	0.4	153	0.4
	MW-1602 <sup>[1]</sup>	2.0	88	0.7	312	0.2	198	0.3
	MW-1603 <sup>[2]</sup>	2.0	146	0.4	37	1.6	218	0.3
	MW-1604 <sup>[2]</sup>	2.0	164	0.4	162	0.4	239	0.3
	MW-1605 <sup>[2]</sup>	2.0	127	0.5	129	0.5	256	0.2
	MW-1606 <sup>[2]</sup>	2.0	190	0.3	188	0.3	169	0.4
	MW-1607 <sup>[2]</sup>	2.0	397	0.2	396	0.2	180	0.3
	MW-1608 <sup>[1]</sup>	2.0	341	0.2	355	0.2	352	0.2
	MW-1609 <sup>[1]</sup>	2.0	NC	NC	NC	NC	NC	NC
	MW-1610 <sup>[2]</sup>	2.0	628	0.1	710	0.1	133	0.5
	MW-1611 <sup>[1]</sup>	2.0	NC	NC	NC	NC	NC	NC
	MW-1612 <sup>[2]</sup>	2.0	333	0.2	317	0.2	893	0.1

Notes:

[1] - Background 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.

**STATISTICAL ANALYSIS SUMMARY**  
**ASH POND 1**  
**Clinch River Plant**  
**Carbo, Virginia**

*Submitted to*



1 Riverside Plaza  
Columbus, Ohio 43215-2372

*Submitted by*



engineers | scientists | innovators

941 Chatham Lane  
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February 7, 2022

CHA8500

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## LIST OF ATTACHMENTS

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

## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LPL	Lower Prediction Limit
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
SSD	Statistically Significant Decrease
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
UTL	Upper Tolerance Limit

## SECTION 1

### EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257.90-257.98, "CCR rule"), groundwater monitoring has been conducted at Ash Pond 1, an existing CCR unit at the Clinch River Plant located in Carbo, Virginia. 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 been completing assessment monitoring since. During 2021, an annual sampling event for Appendix IV parameters required by 257.95(b) was completed in February, and semi-annual sampling events for Appendix III and the detected Appendix IV parameters required by 257.95(d)(1) were completed in April and October. During the February and April 2021 assessment monitoring events, SSLs were observed for barium, cobalt, lithium, molybdenum (Geosyntec, 2021a). One assessment monitoring event was conducted at the Ash Pond 1 in October 2021 in accordance with 40 CFR 257.95. The results of this assessment event are documented in this report.

Monitoring data from the October 2021 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 which 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 re-established for the Appendix IV parameters to assess whether Appendix IV parameters were present at an SSL above the GWPS. SSLs were identified for barium, cobalt, lithium, and molybdenum. Thus, 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.

## SECTION 2

### ASH POND 1 EVALUATION

#### **2.1 Data Validation & QA/QC**

During the assessment monitoring program, 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) in October 2021. The geological units consist of the Chattanooga Shale, the Rome Limestone, and the Dumps Fault water-bearing unit. Samples from the October 2021 event 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 (NELAP). Quality assurance and quality control (QA/QC) samples completed by the analytical laboratory included the use of laboratory reagent blanks (LRBs), continuing calibration verification (CCV) 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.9.6.32 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 2021 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 determined to be the greater value of (1) the background concentration and (2) the maximum contaminant level (MCL) or the level specified in 40 CFR 257.95(h)(2) for each Appendix IV parameter. To determine background concentrations, an upper tolerance limit (UTL) was calculated using pooled data from the background wells collected during the background monitoring and assessment

monitoring events. Generally, tolerance limits were calculated parametrically with 95% coverage and 95% confidence. Non-parametric tolerance limits were calculated in instances where data have either non-normal distributions or a high non-detect frequency. Non-parametric tolerance limits for Chattanooga Shale wells were calculated for arsenic, barium, fluoride, lithium, and selenium due to apparent non-normal distributions, and for beryllium, cadmium, mercury, and thallium due to a high non-detect frequency. Non-parametric tolerance limits for Rome Limestone wells were calculated for arsenic, cadmium and lithium due to apparent non-normal distributions, and for beryllium, mercury, and thallium due to a high non-detect frequency. Non-parametric tolerance limits for Dumps Fault wells were calculated for combined radium due to apparent non-normal distributions, and for beryllium, cadmium, mercury, and thallium due to a high non-detect frequency. 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 ( $\alpha = 0.01$ ); however, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect 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). Calculated confidence limits are shown in Attachment B.

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

- The LCL for barium at MW-1603 (2.07 mg/L) and MW-1604 (3.08 mg/L) exceeded the GWPS of 2.00 mg/L, and the LCL for lithium at MW-1605 (0.186 mg/L) exceeded the GWPS of 0.118 mg/L in the Chattanooga Shale formation.
- The LCL for cobalt at MW-1607 (0.00809 mg/L) exceeded the GWPS of 0.00600 mg/L, the LCLs for lithium at MW-1606 (0.0553 mg/L) and MW-1607 (0.117 mg/L) exceeded the GWPS of 0.0400 mg/L, and the LCL for molybdenum at MW-1607 (0.131 mg/L) exceeded the GWPS of 0.100 mg/L in the Rome Limestone formation.
- The LCL for cobalt at MW-1610 (0.00655 mg/L) exceeded the GWPS of 0.00600 mg/L, the LCL for lithium at MW-1610 (0.171 mg/L) exceeded the GWPS of 0.165 mg/L, and the LCL for molybdenum at MW-1610 (0.135 mg/L) exceeded the GWPS of 0.100 mg/L in the Dumps Fault water bearing unit.

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 2021 *Statistical Analysis Summary* report (Geosyntec, 2021b):

- In the Chattanooga Shale formation, intrawell tests were used to evaluate potential SSIs for boron, fluoride, sulfate, and total dissolved solids (TDS), whereas 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, whereas 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 have been updated periodically during the assessment monitoring period as sufficient data became available.

Prediction limits for the interwell tests were recalculated using data collected during the 2021 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, and decreasing trends were found for chloride at MW-1601 and MW-1608 in Chattanooga Shale and MW-1609 in Rome Limestone. However, the magnitudes of the trends were low compared to the average concentrations; thus, no adjustments were made to the background datasets. 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.

The intrawell prediction limits for the three formations were previously calculated using historical data through April 2020 (Geosyntec, 2021b). For the intrawell tests, insufficient new data was available to compare against the existing background dataset; thus, the prediction limits were not updated with newer data for the intrawell tests at this time. However, since the previous background update, additional data from the May 2019 sampling event were provided; thus, intrawell prediction limits using a one-of-two retesting procedure were recalculated to incorporate additional data from May 2019.

After the revised background set was established, a parametric or non-parametric analysis was selected based on the distribution of the data and the frequency of non-detect data. Estimated results less than the practical quantitation limit (PQL) – i.e., “J-flagged” data – were considered detections and the estimated results were used in the statistical analyses. Non-parametric analyses were selected for datasets with at least 50% non-detect data or datasets that could not be



normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk / Shapiro-Francia test for normality. The Kaplan-Meier non-detect adjustment was applied to datasets with between 15% and 50% non-detect data. For datasets with fewer than 15% non-detect data, non-detect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or non-parametric) and transformation (where applicable) for each background dataset are shown in Attachment B.

Both interwell and intrawell UPLs were calculated for a one-of-two retesting procedure; i.e., if at least one sample in a series of two does not exceed 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 does not exceed 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 achieving an acceptably high statistical power to 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 exceeded background concentrations. Prediction limits were calculated for the Appendix III parameters to represent background values.

Data collected during the October 2021 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 exceeded the Chattanooga Shale interwell UPL of 7.25 mg/L at MW-1603 (24.1 mg/L), MW-1604 (22.9 mg/L), MW-1605 (41.6 mg/L), and MW-1612 (42.3 mg/L).
- Chloride concentrations exceeded the Chattanooga Shale interwell UPL of 45.8 mg/L at MW-1603 (127 mg/L) and MW-1605 (164 mg/L mg/L).
- Fluoride concentrations exceeded the Chattanooga Shale intrawell UPL of 0.288 mg/L at MW-1604 (0.31 mg/L).
- Chloride concentrations exceeded the Rome Limestone interwell UPL of 4.10 mg/L at MW-1606 (13.4 mg/L) and MW-1607 (6.74 mg/L).
- Sulfate concentrations exceeded the Rome Limestone interwell UPL of 20.9 mg/L at MW-1606 (44.8 mg/L) and MW-1607 (128 mg/L).

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

- pH values were below the Chattanooga Shale interwell LPL of 8.0 standard units (SU) for MW-1603 (7.2 SU), MW-1604 (7.6 SU), and MW-1612 (7.4 SU).

While the prediction limits were calculated for a one-of-two retesting procedure, SSIs were conservatively assumed if the initial (October 2021) sample was above the UPL or below the LPL.

### **2.3 Conclusions**

A semi-annual 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 re-established 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 exceeded the GWPS. SSLs were identified for barium, cobalt, lithium, and molybdenum.

Appendix III parameters were compared to recalculated prediction limits. Calcium, chloride, fluoride, and sulfate results exceeded 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.

## **SECTION 3**

### **REFERENCES**

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

Geosyntec. 2020. Statistical Analysis Plan. October 2021.

Geosyntec. 2021a. Statistical Analysis Summary – Ash Pond 1, Clinch River Plant, Carbo, Virginia. October 2021.

Geosyntec. 2021b. Statistical Analysis Summary – Ash Pond 1, Clinch River Plant, Carbo, Virginia. February 2021.

# TABLES

**Table 1 - Groundwater Data Summary  
Clinch River Plant - Ash Pond 1**

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
		10/11/2021	10/11/2021	10/12/2021	10/12/2021	10/12/2021	10/12/2021	10/11/2021	10/11/2021	10/11/2021	10/12/2021	10/11/2021	10/12/2021
Antimony	µg/L	0.05 J	0.35	0.08 J	0.06 J	0.02 J	0.02 J	0.03 J	0.03 J	0.04 J	0.08 J	0.03 J	0.03 J
Arsenic	µg/L	7.00	1.61	2.81	4.58	1.29	8.37	1.42	0.98	0.09 J	1.41	6.64	0.48
Barium	µg/L	161	100	2,740	3,130	2,390	127	66.8	27.7	387	285	208	2,470
Beryllium	µg/L	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.019 J	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Boron	mg/L	0.550	0.578	0.252	0.444	0.548	0.139	0.108	0.332	0.05 U	0.035 J	0.549	0.400
Cadmium	µg/L	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.032	0.064	0.02 U	0.015 J	0.007 J	0.02 U	0.02 U
Calcium	mg/L	5.4	4.3	24.1	22.9	41.6	57.7	44.1	0.8	71.1	30.9	22.6	42.3
Chloride	mg/L	18.9	4.56	127	16.6	164	13.4	6.74	5.68	1.40	9.84	13.5	27.5
Chromium	µg/L	0.14 J	0.07 J	0.24	0.19 J	0.24	0.48	0.2 U	0.23	0.07 J	0.49	0.11 J	0.18 J
Cobalt	µg/L	0.066	0.023	0.206	0.210	0.038	4.19	6.25	0.122	0.241	4.97	0.016 J	0.116
Combined Radium	pCi/L	0.27	0.51	1.85	1.37	1.65	6.15	1.63	0.68	1.3	0.48	0.36	1.9
Fluoride	mg/L	2.30	1.65	0.12	0.31	0.36	0.22	0.24	0.42	0.24	0.20	0.91	0.18
Lead	µg/L	0.4 U	0.2 U	0.2 U	0.2 U	0.06 J	0.98	0.22	0.10 J	0.57	0.94	0.2 U	0.2 U
Lithium	mg/L	0.0921	0.0350	0.0613	0.0739	0.191	0.0979	0.108	0.0189	0.00095	0.150	0.0604	0.115
Mercury	µg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Molybdenum	µg/L	0.9	1.4	0.5	0.2 J	0.5	69.4	122	1.0	0.3 J	83.0	1.5	0.3 J
Selenium	µg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.13 J	0.12 J	0.5 U	0.5 U	0.13 J	0.5 U	0.5 U
Sulfate	mg/L	156	20.2	0.63	0.4 U	0.4 U	44.8	128	163	17.0	14.5	48.3	0.4 U
Thallium	µg/L	0.4 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Dissolved Solids	mg/L	1,360	520	450	390	660	330	260	420	260	210	540	520
pH	SU	8.6	8.5	7.2	7.6	8.0	7.3	8.0	8.5	7.7	8.0	8.1	7.4

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J: Estimated value. Parameter was detected in concentrations below the reporting limit.

-: Not sampled

**Table 2A: Groundwater Protection Standards  
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		0.000386	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		0.00122	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.000416	0.00600
Combined Radium, Total (pCi/L)	5.00		2.75	5.00
Fluoride, Total (mg/L)	4.00		2.42	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000562	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	0.0153	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value

MCL = Maximum Contaminant Level

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: Groundwater Protection Standards  
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		0.000117	0.00600
Arsenic, Total (mg/L)	0.0100		0.000970	0.0100
Barium, Total (mg/L)	2.00		0.526	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		0.000336	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.00132	0.00600
Combined Radium, Total (pCi/L)	5.00		5.19	5.19
Fluoride, Total (mg/L)	4.00		0.348	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00130	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	0.00244	0.100
Selenium, Total (mg/L)	0.0500		0.000409	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value

MCL = Maximum Contaminant Level

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: Groundwater Protection Standards  
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		0.00112	0.00600
Arsenic, Total (mg/L)	0.0100		0.0457	0.0457
Barium, Total (mg/L)	2.00		0.201	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		0.000963	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.000144	0.00600
Combined Radium, Total (pCi/L)	5.00		1.94	5.00
Fluoride, Total (mg/L)	4.00		1.36	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000212	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.165	0.165
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00613	0.100
Selenium, Total (mg/L)	0.0500		0.000307	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value

MCL = Maximum Contaminant Level

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  
Clinch River Plant - Ash Pond 1**

<b>Formation</b>	<b>Well ID</b>	<b>Constituent</b>	<b>GWPS</b>	<b>LCL</b>
Chattanooga Shale	MW-1603	Barium	2.00	2.07
	MW-1604	Barium	2.00	3.08
	MW-1605	Lithium	0.118	0.186
Rome Limestone	MW-1606	Lithium	0.0400	0.0553
	MW-1607	Cobalt	0.00600	0.00809
		Lithium	0.0400	0.117
		Molybdenum	0.100	0.131
Dumps Fault	MW-1610	Cobalt	0.00600	0.00655
		Lithium	0.165	0.171
		Molybdenum	0.100	0.135

Notes:

All values are in mg/L

GWPS - Groundwater protection standard

LCL - lower confidence limit

**Table 4A - Appendix III Data Summary  
Clinch River Plant - Ash Pond 1**

Analyte	Unit	Description	Chattanooga Shale			
			MW-1603	MW-1604	MW-1605	MW-1612
			10/12/2021	10/12/2021	10/12/2021	10/12/2021
Boron	mg/L	Intrawell Background Value (UPL)	0.489	0.501	0.673	0.590
		Analytical Result	0.252	0.444	0.548	0.400
Calcium	mg/L	Interwell Background Value (UPL)	7.25			
		Analytical Result	<b>24.1</b>	<b>22.9</b>	<b>41.6</b>	<b>42.3</b>
Chloride	mg/L	Interwell Background Value (UPL)	45.8			
		Analytical Result	<b>127</b>	16.6	<b>164</b>	27.5
Fluoride	mg/L	Intrawell Background Value (UPL)	0.185	0.288	0.428	0.255
		Analytical Result	0.12	<b>0.31</b>	0.36	0.18
pH	SU	Interwell Background Value (UPL)	9.0			
		Interwell Background Value (LPL)	8.0			
		Analytical Result	<b>7.2</b>	<b>7.6</b>	8.0	<b>7.4</b>
Sulfate	mg/L	Intrawell Background Value (UPL)	31.5	4.87	133	18.1
		Analytical Result	0.63	0.06	0.06	0.06
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	682	417	902	577
		Analytical Result	450	390	660	520

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

**Table 4B - Appendix III Data Summary  
Clinch River Plant - Ash Pond 1**

Analyte	Unit	Description	Rome Limestone	
			MW-1606	MW-1607
			10/12/2021	10/11/2021
Boron	mg/L	Intrawell Background Value (UPL)	0.206	0.185
		Analytical Result	0.139	0.108
Calcium	mg/L	Intrawell Background Value (UPL)	65.8	53.1
		Analytical Result	57.7	44.1
Chloride	mg/L	Interwell Background Value (UPL)	4.10	
		Analytical Result	<b>13.4</b>	<b>6.74</b>
Fluoride	mg/L	Intrawell Background Value (UPL)	0.289	0.272
		Analytical Result	0.22	0.24
pH	SU	Intrawell Background Value (UPL)	7.5	8.3
		Intrawell Background Value (LPL)	6.7	7.2
		Analytical Result	7.3	8.0
Sulfate	mg/L	Interwell Background Value (UPL)	20.9	
		Analytical Result	<b>44.8</b>	<b>128</b>
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	384	316
		Analytical Result	330	260

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

**Table 4C - Appendix III Data Summary  
Clinch River Plant - Ash Pond 1**

Analyte	Unit	Description	Dumps Fault
			MW-1610
			10/12/2021
Boron	mg/L	Intrawell Background Value (UPL)	0.117
		Analytical Result	0.035
Calcium	mg/L	Intrawell Background Value (UPL)	38.7
		Analytical Result	30.9
Chloride	mg/L	Intrawell Background Value (UPL)	12.5
		Analytical Result	9.84
Fluoride	mg/L	Intrawell Background Value (UPL)	0.225
		Analytical Result	0.20
pH	SU	Intrawell Background Value (UPL)	8.0
		Intrawell Background Value (LPL)	7.1
		Analytical Result	8.0
Sulfate	mg/L	Intrawell Background Value (UPL)	51.8
		Analytical Result	14.5
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	267
		Analytical Result	210

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

## ATTACHMENT A

Certification by Qualified Professional Engineer

**Certification by Qualified Professional Engineer**

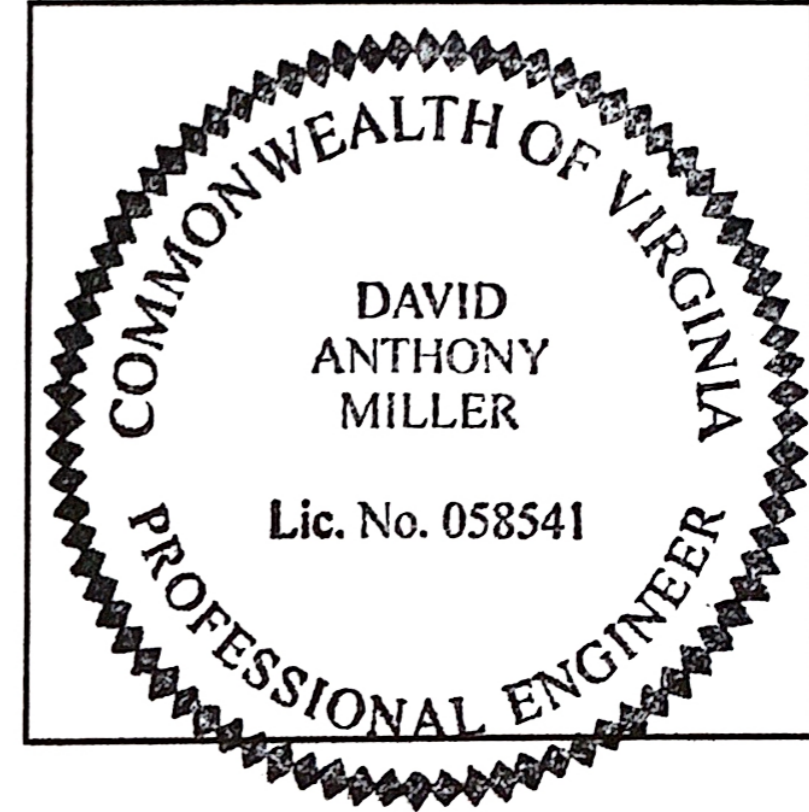
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Clinch River Ash Pond 1 CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



058541

License Number

VIRGINIA

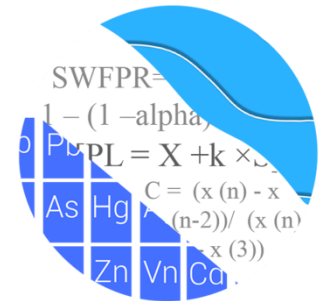
Licensing State

02.07.22

Date

**ATTACHMENT B**  
**Statistical Analysis Output**

# GROUNDWATER STATS CONSULTING



January 27, 2022

Geosyntec Consultants  
Attn: Ms. Allison Kreinberg  
941 Chatham Lane, #103  
Worthington, OH 43221

RE: Clinch River Pond 1 – Assessment Monitoring Report & Background Update – 2021

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 2021 groundwater data for 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 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 Dr. Jim Loftis, Civil & Environmental Engineering professor emeritus at Colorado State University and Senior Advisor to Groundwater Stats Consulting, and Kristina Rayner, Founder and Groundwater Statistician for Groundwater Stats Consulting.

The CCR program consists of the following 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. 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. For calculating intrawell prediction limits, the substitution is performed for individual wells and may differ across wells. This generally gives the most conservative limit in each case. 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 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. While the false positive rate associated with the parametric limits is based on an annual 10% (5% per semi-annual event) as recommended by the EPA Unified Guidance (2009), the false positive rate associated with the nonparametric limits is dependent upon the available background sample size, number of future comparisons, and verification resample plan. 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 (US EPA, 2009), data are analyzed using either parametric or non-parametric prediction limits. 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 in background, simple substitution of one half the reporting limit is utilized in the statistical analysis. The reporting limit

utilized for non-detects is the 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 prediction 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 similar 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

During this analysis 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 will be updated after the Fall 2022 sample event when sufficient compliance samples are available.

### Outlier Analysis

Prior to updating background data during this 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 (Figures D).

## 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 (Figures E). Statistically significant trends were identified for the following upgradient well/constituent pairs:

### Chattanooga Shale

- Calcium: MW-1602
- 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 (Figures F). Downgradient measurements will be compared to these background limits during each subsequent semi-annual sampling event.

## **Evaluation of Appendix IV Parameters – October 2021**

Prior to constructing statistical limits, data at all wells are screened through October 2021 using time series plots to identify outliers and extreme trending patterns that would lead to artificially elevated statistical limits. For the downgradient well data that are used to construct 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. No new suspected outliers were identified during this analysis and no changes were made to previous flagged values. 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, and this value was flagged. In addition, high values for cobalt and lead in well MW-1611 were identified visually and flagged. 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 2021 at each of the formations (Figures G). 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.

### 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 H), 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 2021 (Figures I). 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:

#### Chattanooga Shale

- Barium: MW-1603 and MW-1604
- 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

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  
Groundwater Statistician

# 100% Non-Detects

Analysis Run 1/24/2022 3:27 PM 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

# Date Ranges

Date: 1/26/2022 3:38 PM

Clinch River LF Client: AEP Data: Clinch River

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Calcium total (mg/L)

MW-1611 background:8/21/2018-4/20/2020

Chloride total (mg/L)

MW-1611 background:8/21/2018-4/20/2020

Sulfate total (mg/L)

MW-1603 background:8/22/2018-4/21/2020

MW-1604 background:8/22/2018-4/21/2020

MW-1605 background:8/22/2018-4/21/2020

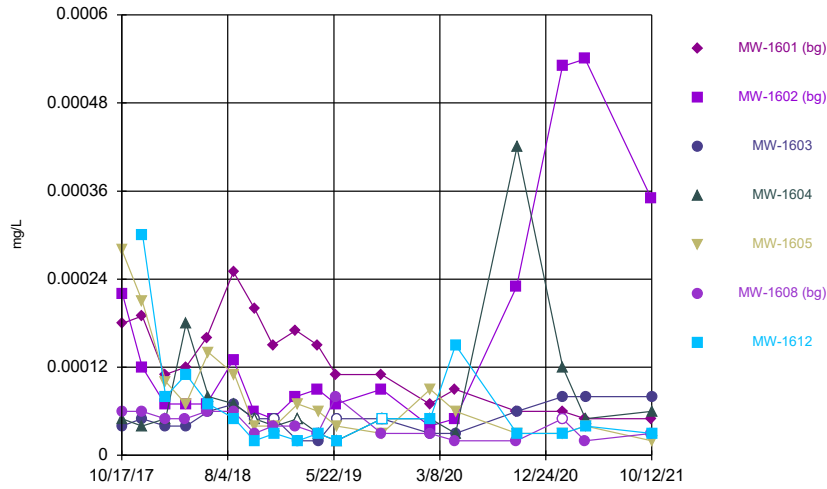
MW-1611 background:8/21/2018-4/20/2020

MW-1612 background:8/22/2018-4/21/2020

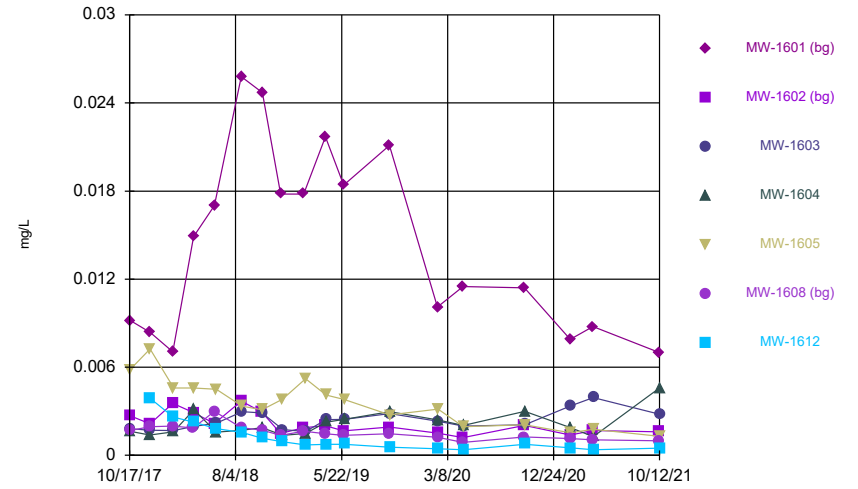
Total Dissolved Solids (mg/L)

MW-1611 background:8/21/2018-4/20/2020

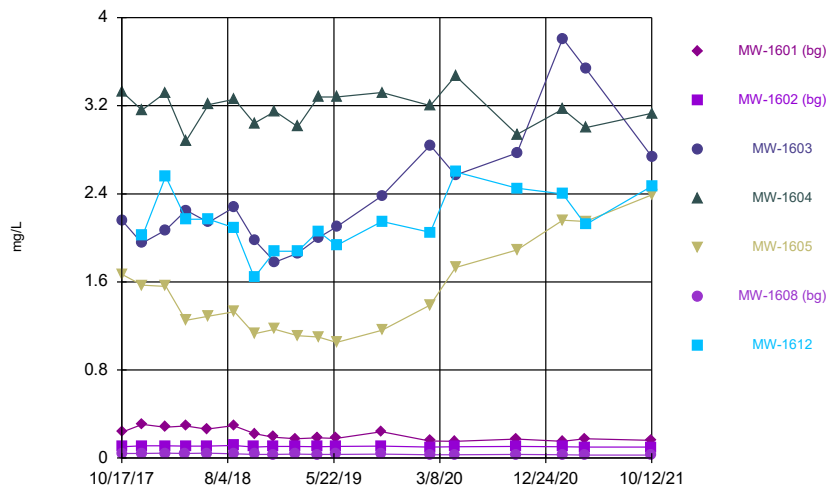
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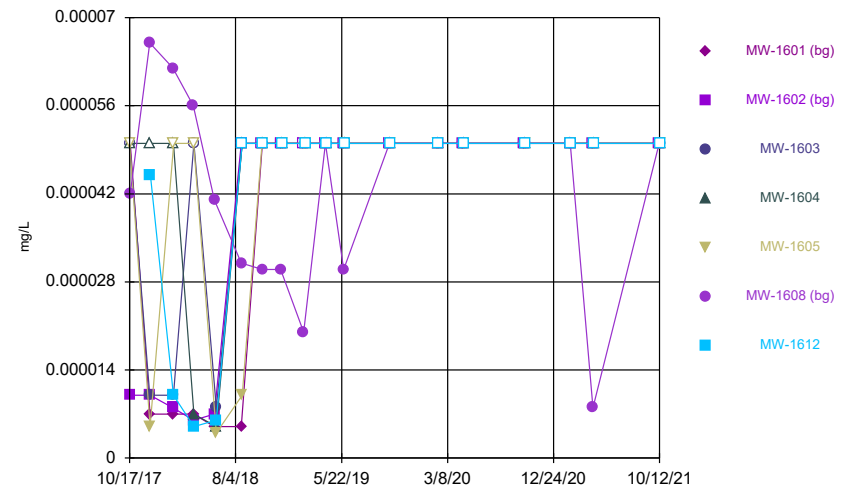
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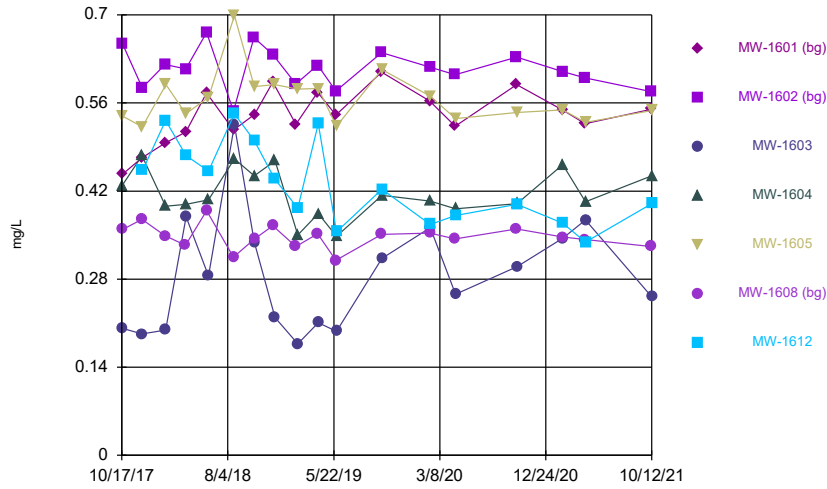
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Time Series

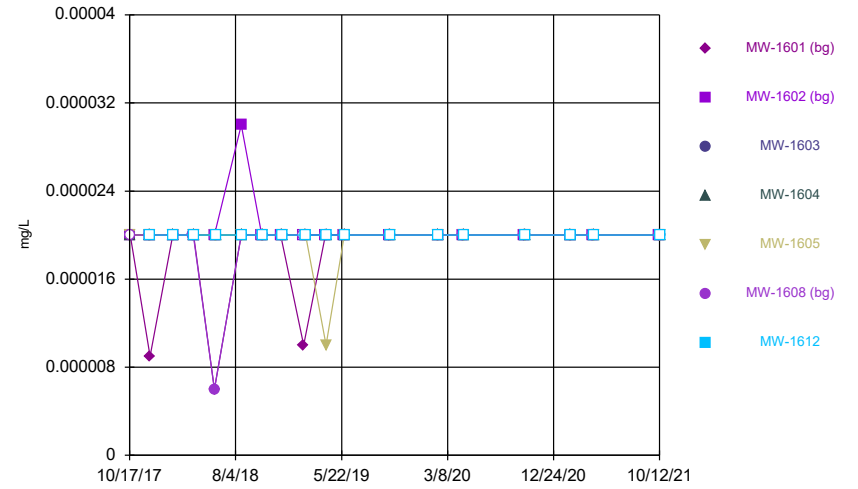


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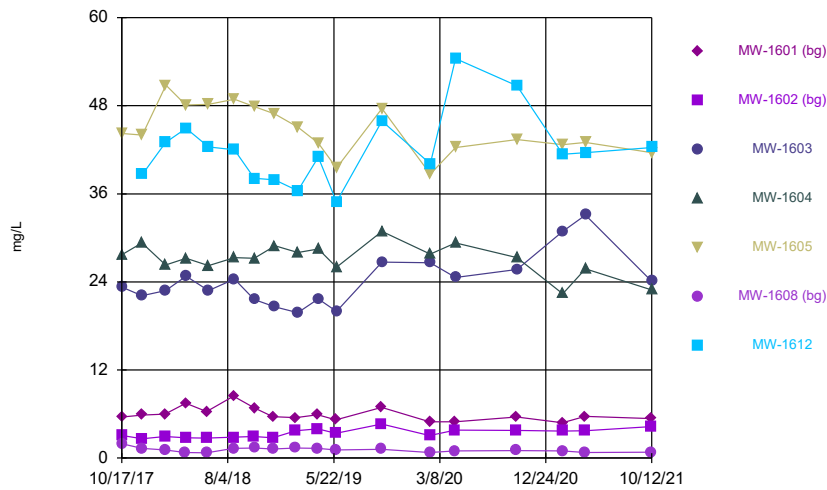
Constituent: Boron total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



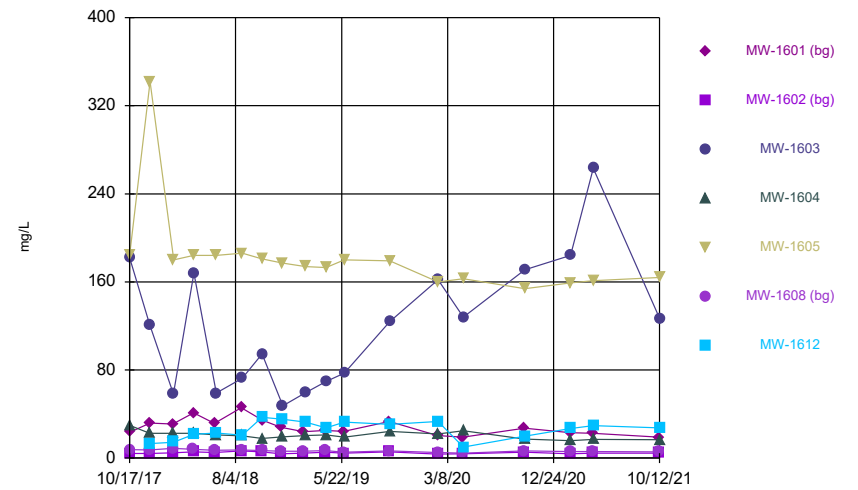
Constituent: Cadmium total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



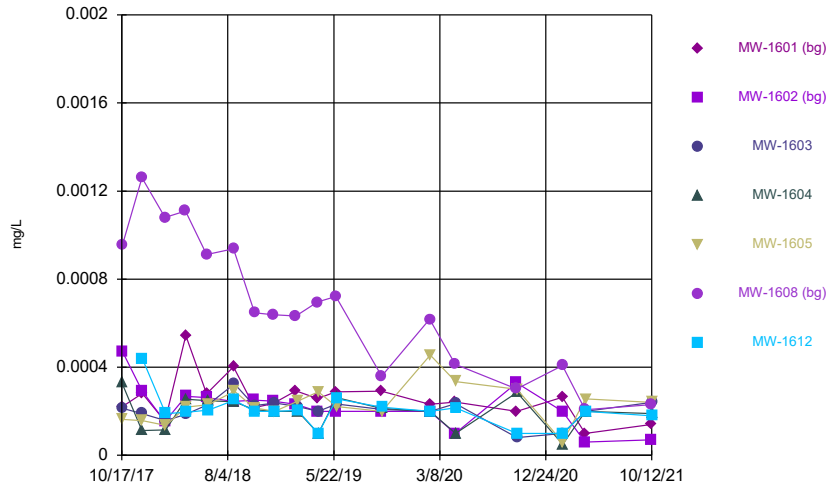
Constituent: Calcium total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



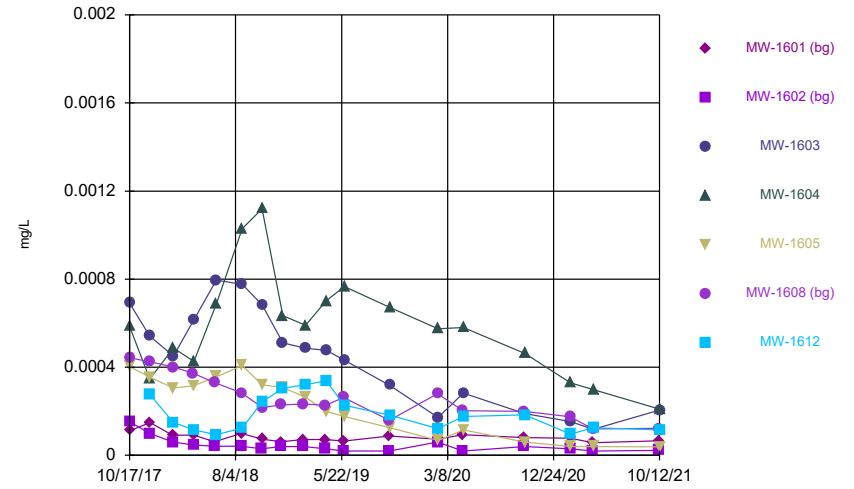
Constituent: Chloride total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



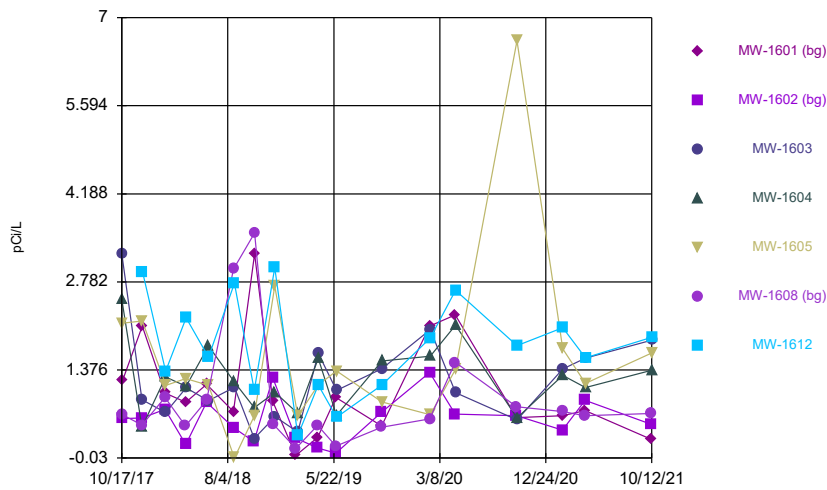
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Clinch River LF Client: AEP Data: Clinch River

Time Series



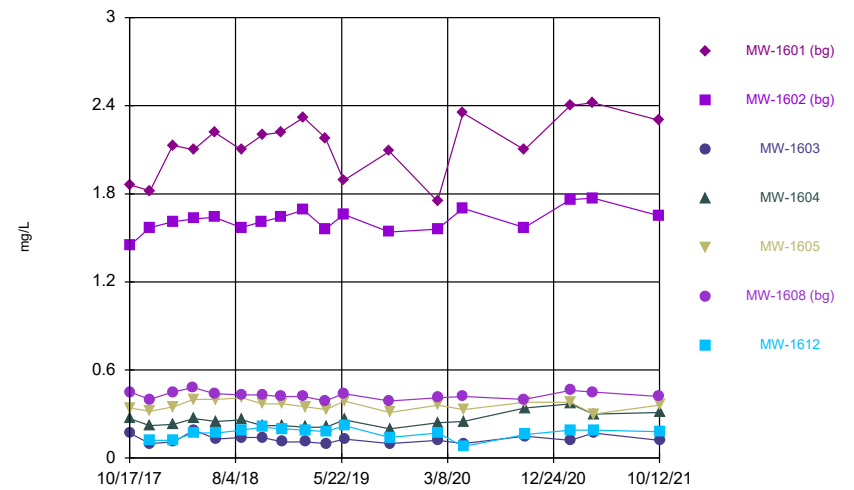
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Clinch River LF Client: AEP Data: Clinch River

Time Series



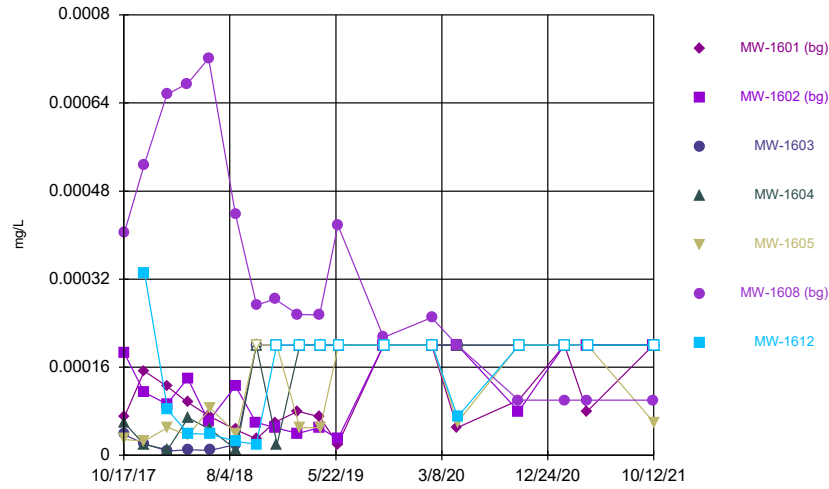
Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale -  
Clinch River LF Client: AEP Data: Clinch River

Time Series



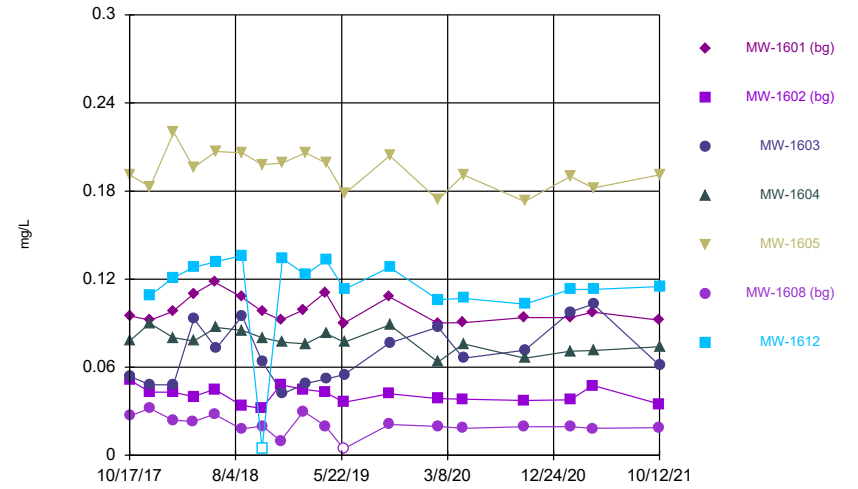
Constituent: Fluoride total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



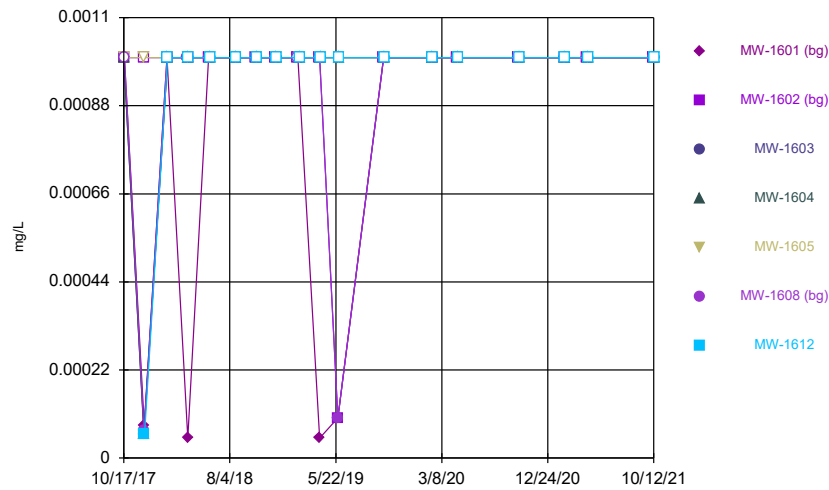
Constituent: Lead total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



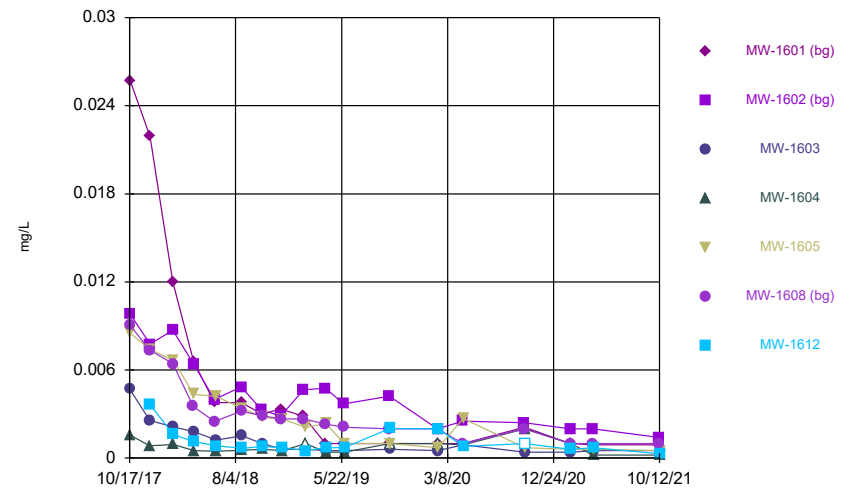
Constituent: Lithium total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



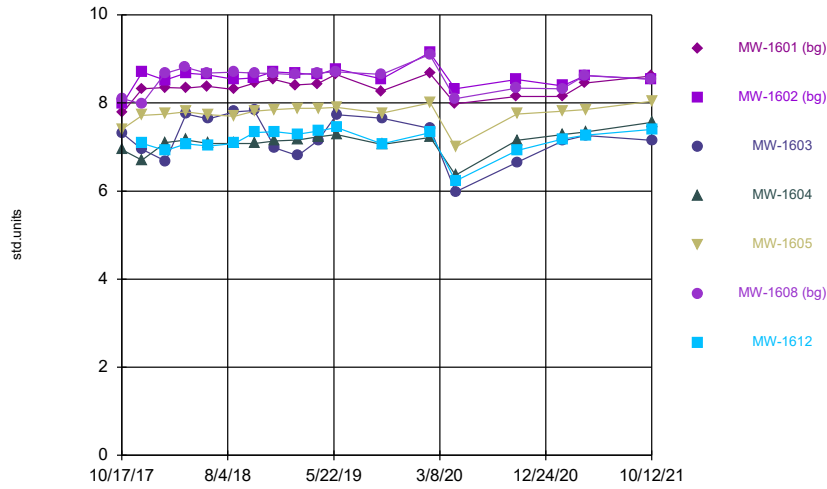
Constituent: Mercury total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



Constituent: Molybdenum total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

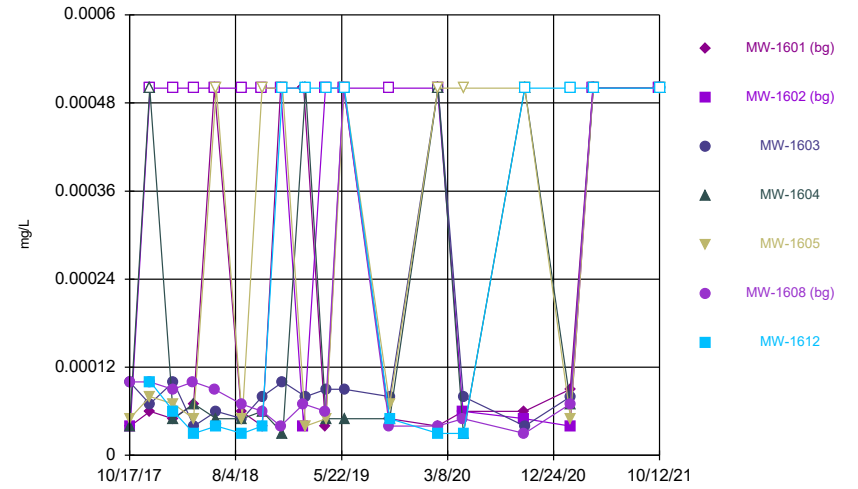
Time Series



Constituent: pH [field] Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

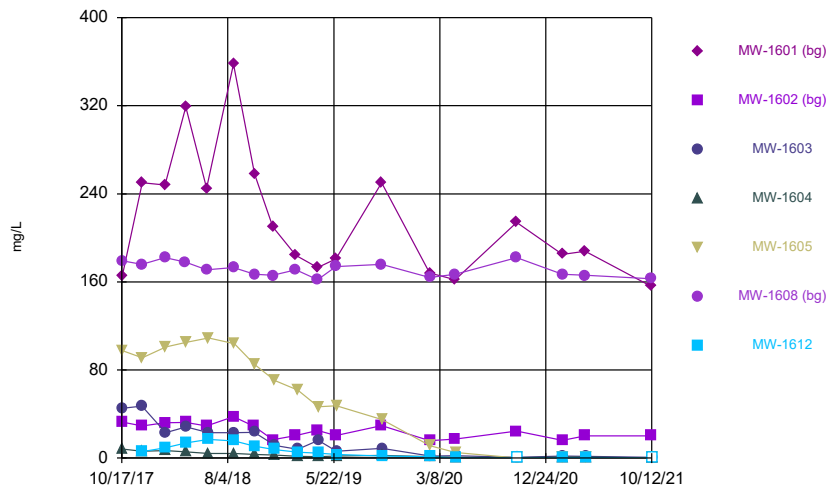
Time Series



Constituent: Selenium total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

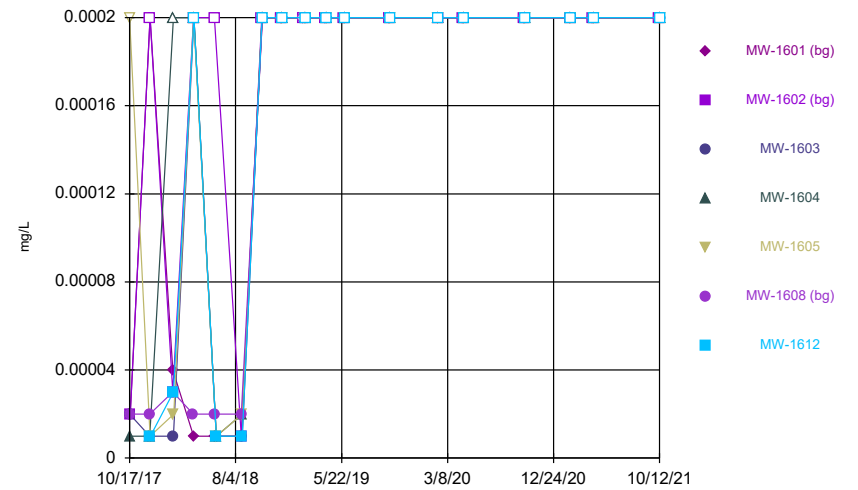
Time Series



Constituent: Sulfate total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

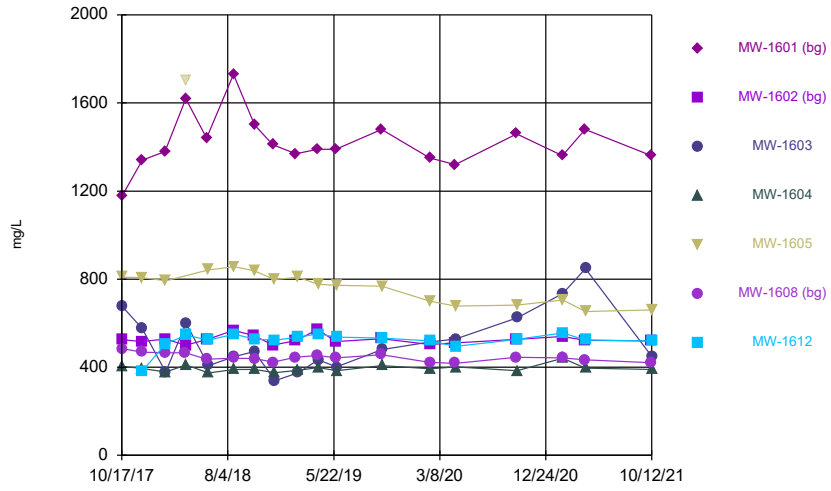
Time Series



Constituent: Thallium total Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

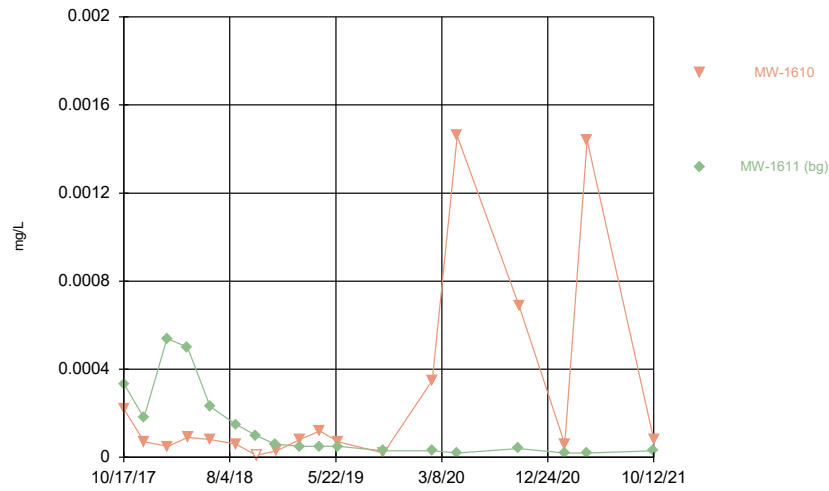


### Time Series



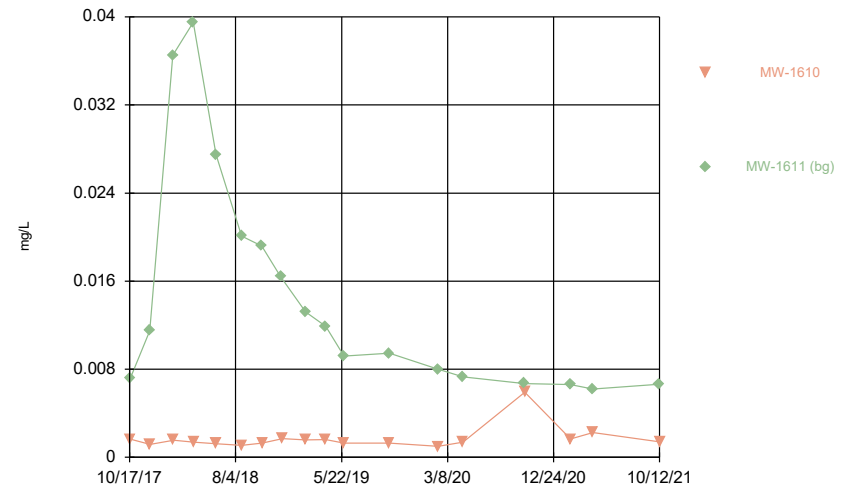
Constituent: Total Dissolved Solids Analysis Run 1/26/2022 1:51 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



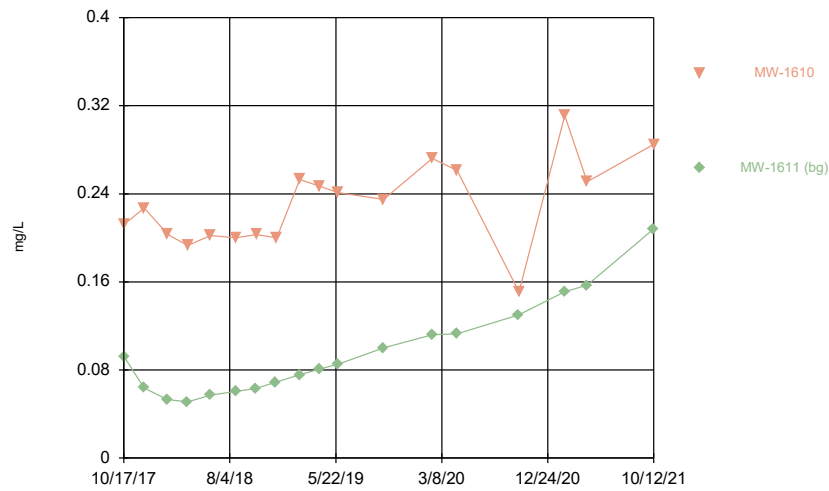
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



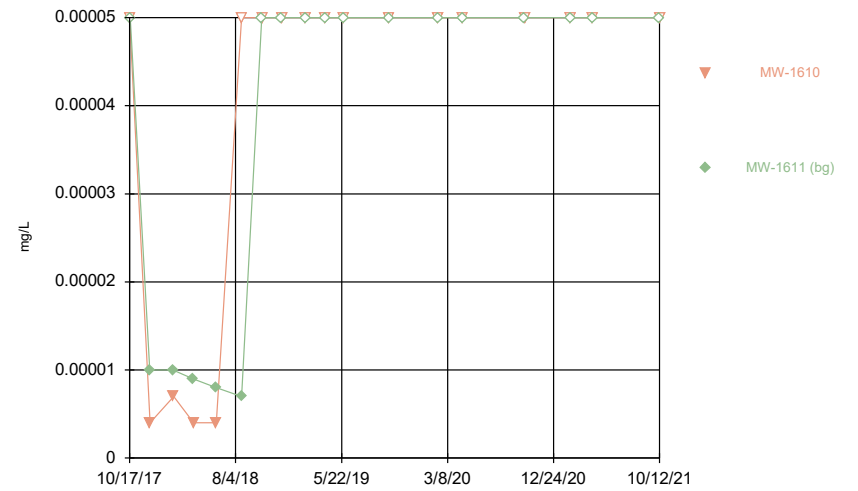
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



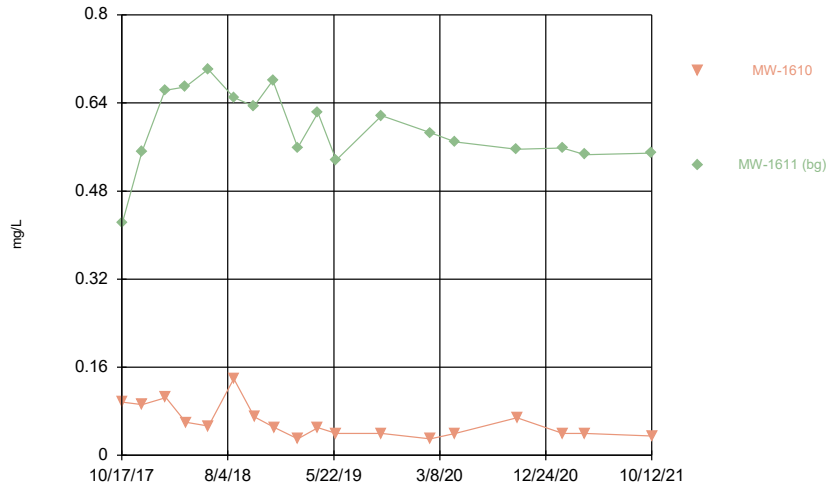
Constituent: Barium total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Beryllium total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

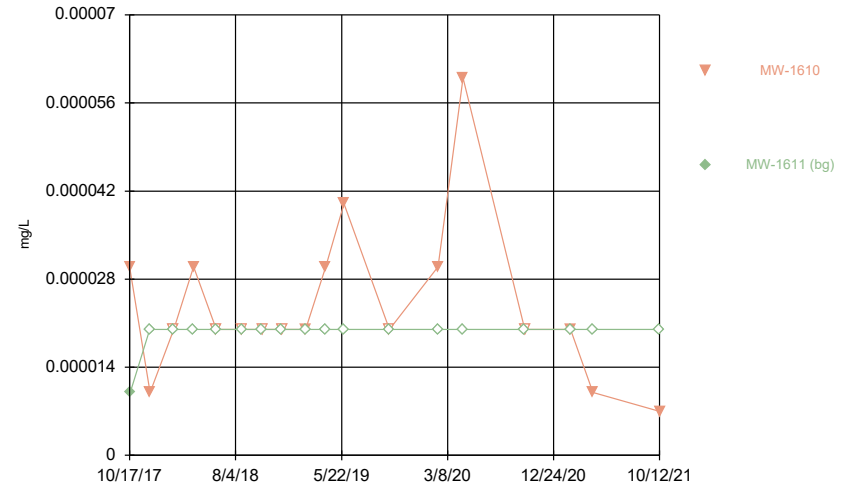
Time Series



Constituent: Boron total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

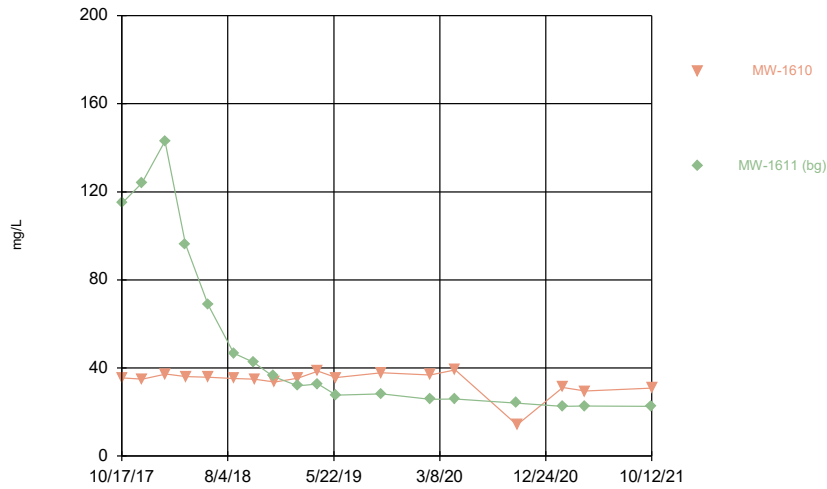
Hollow symbols indicate censored values.

Time Series



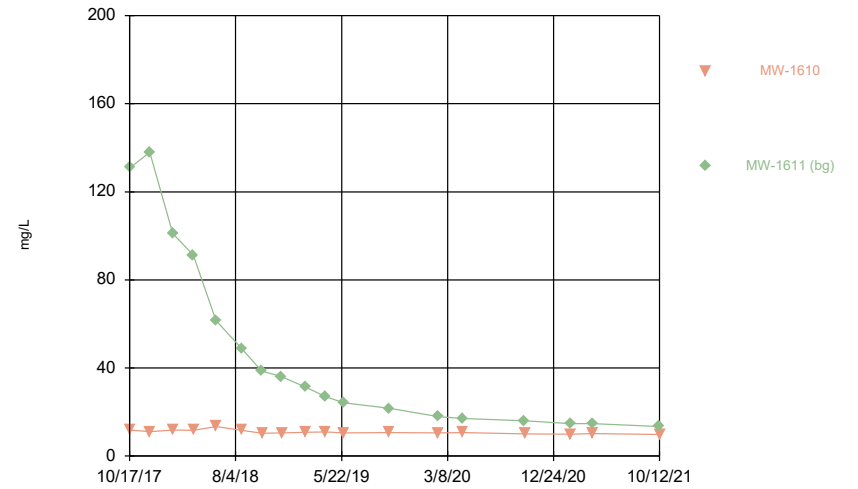
Constituent: Cadmium total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Calcium total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

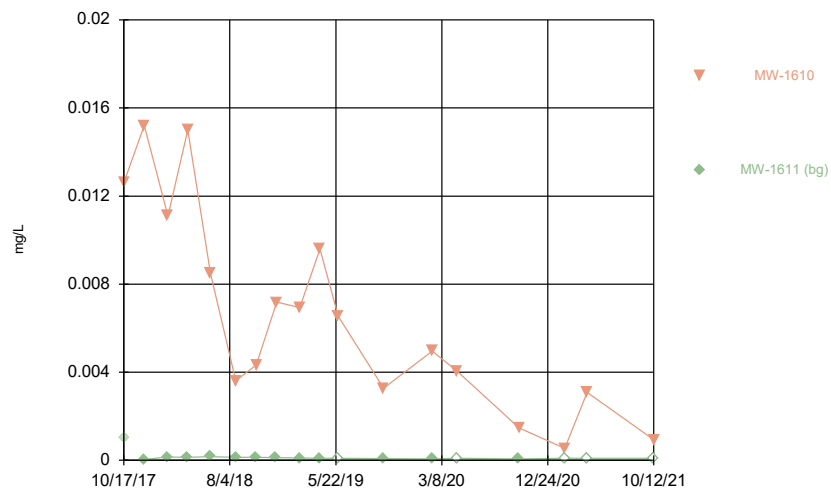
Time Series



Constituent: Chloride total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

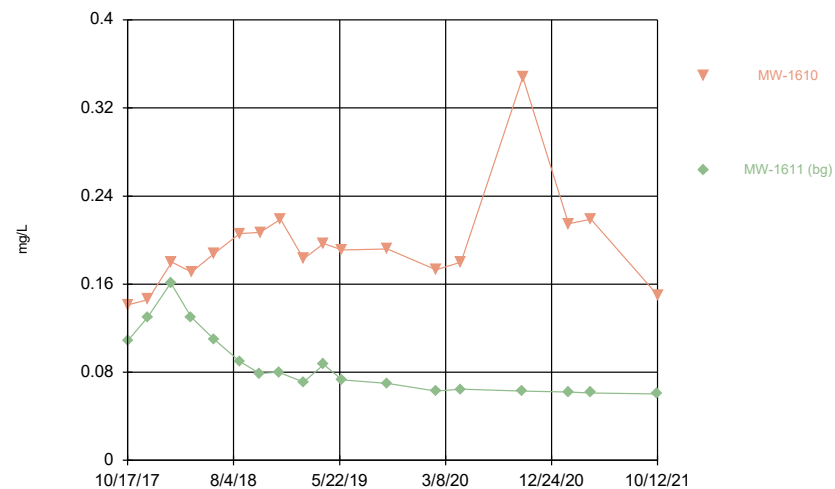


Time Series



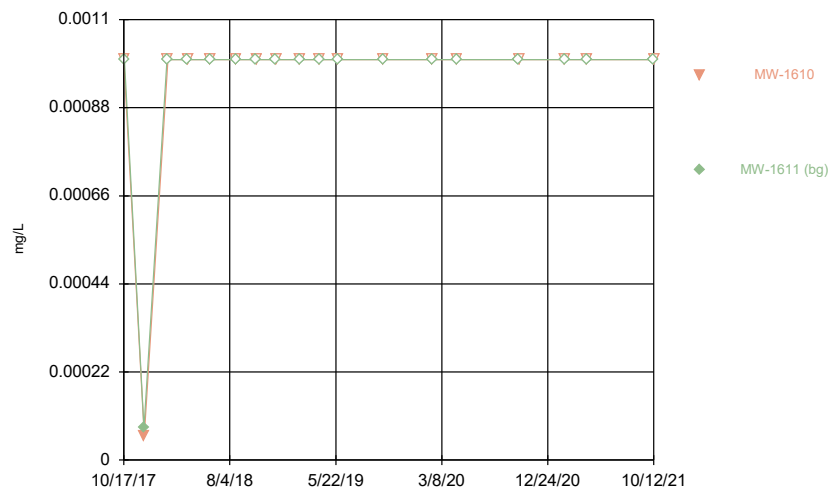
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Clinch River LF Client: AEP Data: Clinch River

Time Series



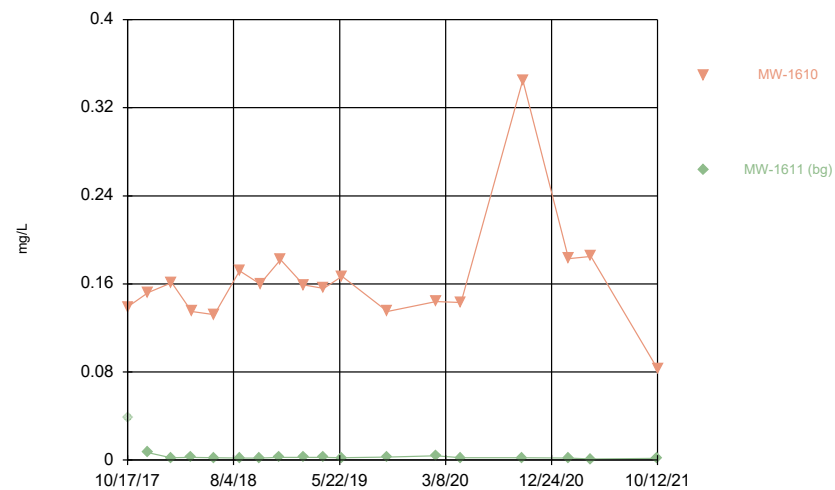
Constituent: Lithium total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Mercury total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

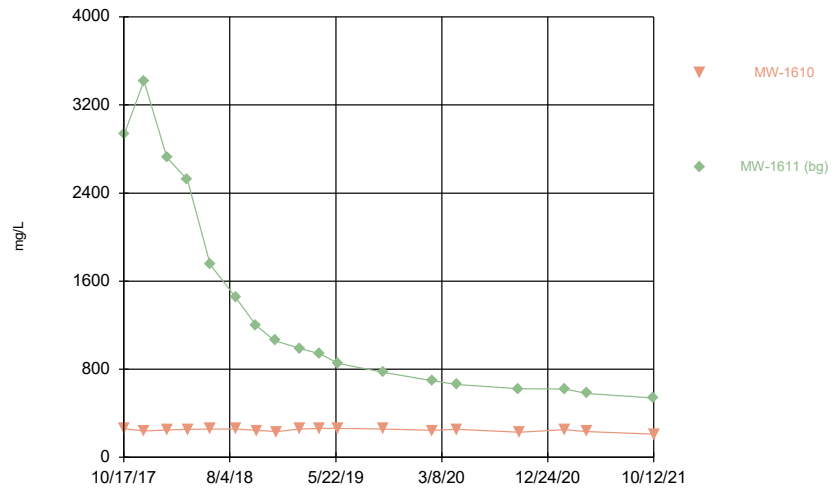
Time Series



Constituent: Molybdenum total Analysis Run 1/26/2022 10:05 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

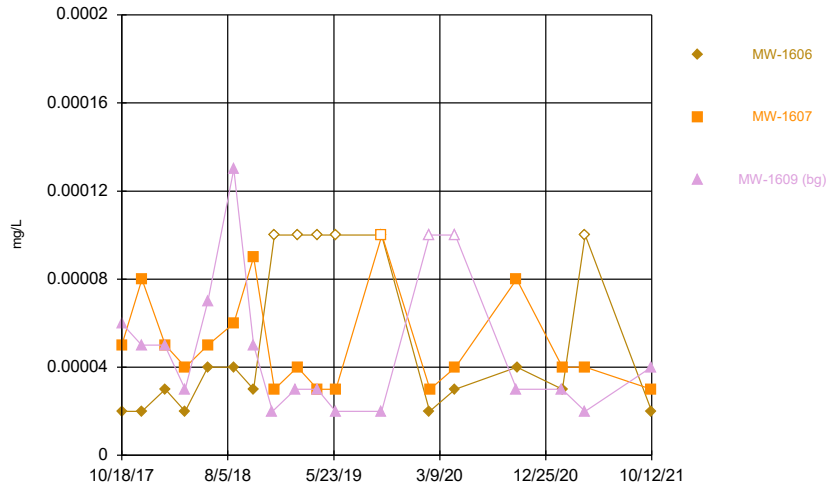


### Time Series



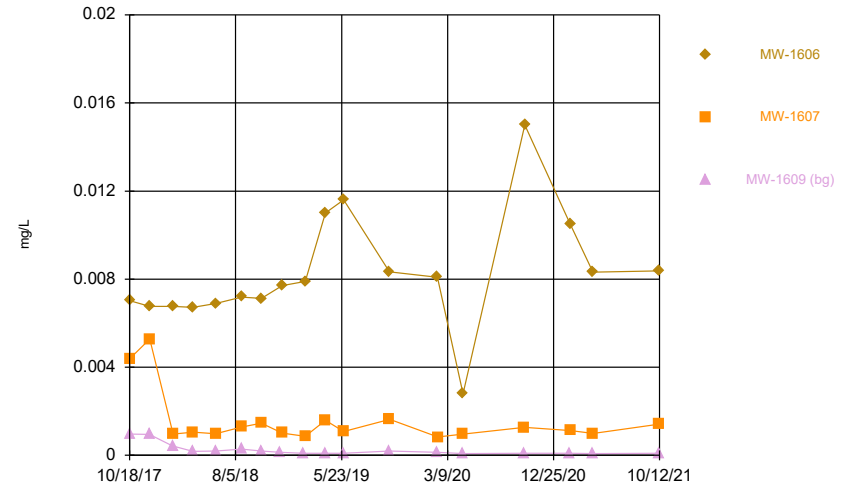
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Clinch River LF Client: AEP Data: Clinch River

Time Series



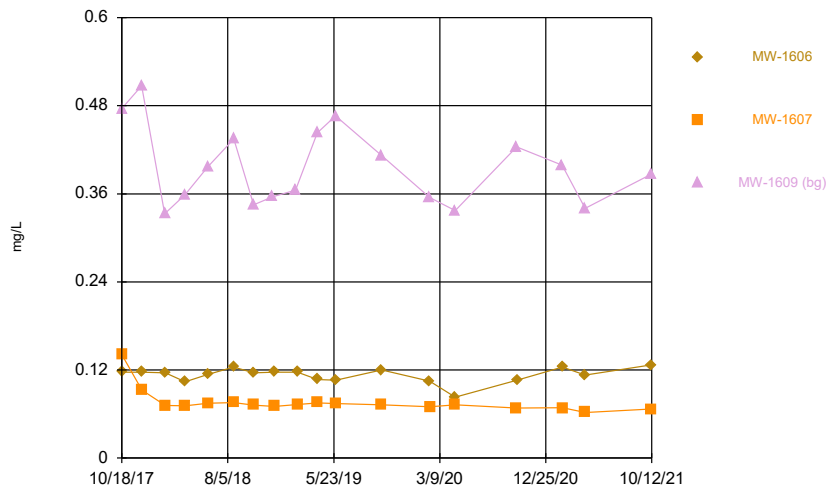
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



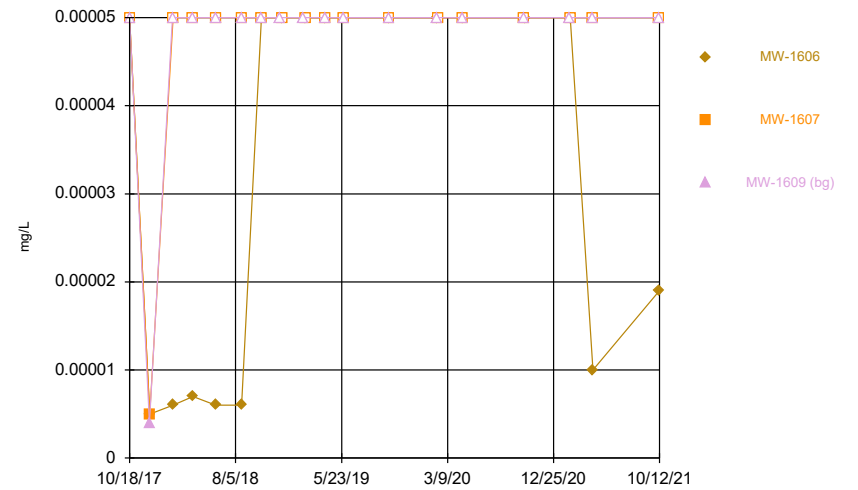
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Barium total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

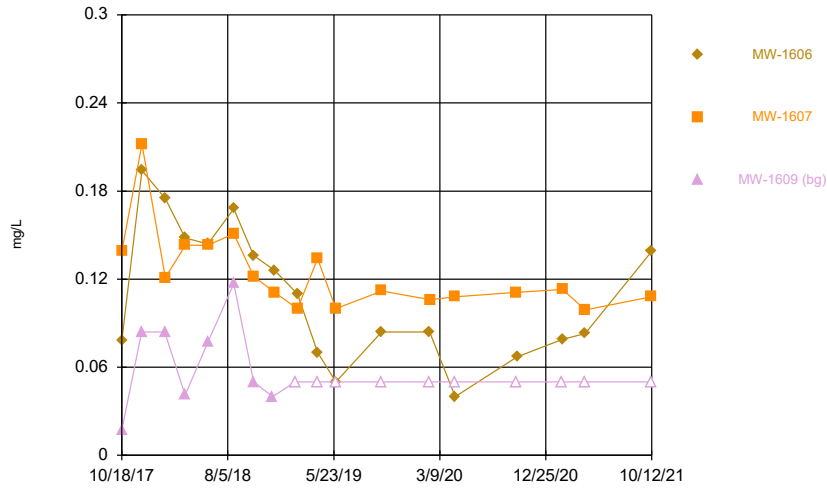
Time Series



Constituent: Beryllium total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

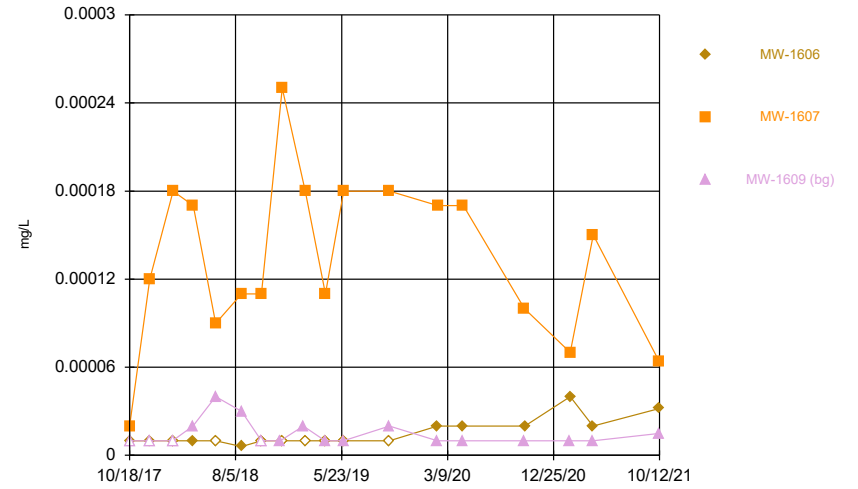


Time Series



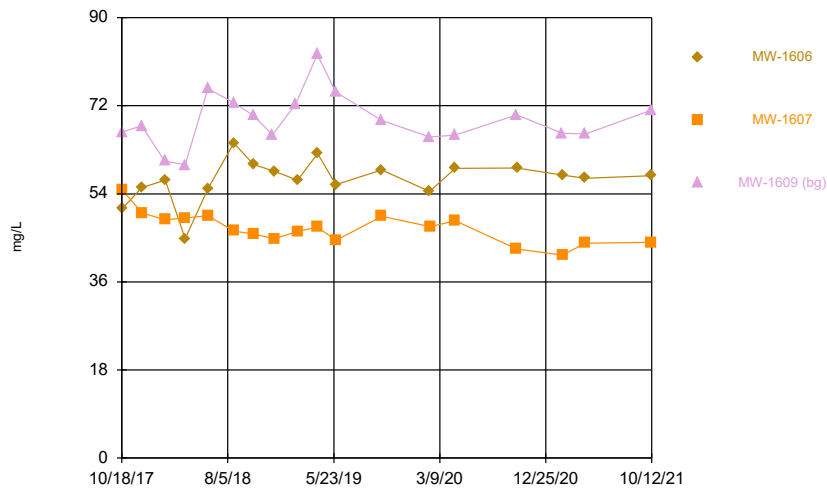
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Clinch River LF Client: AEP Data: Clinch River

Time Series



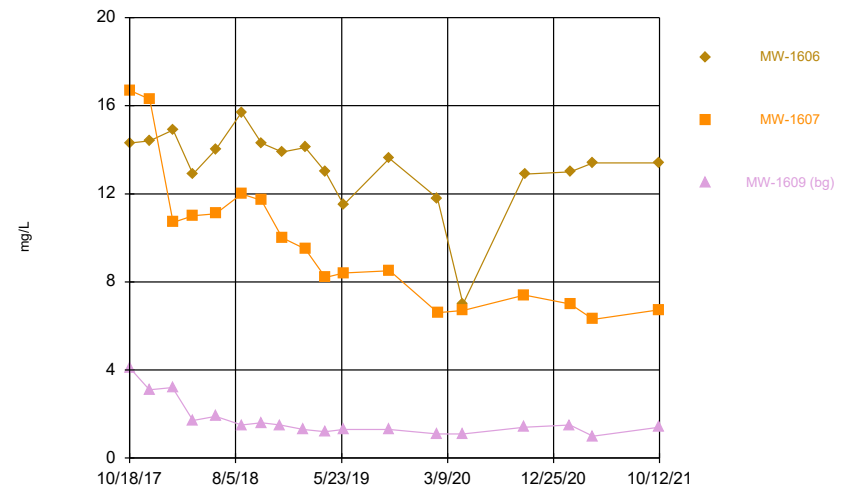
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Clinch River LF Client: AEP Data: Clinch River

Time Series



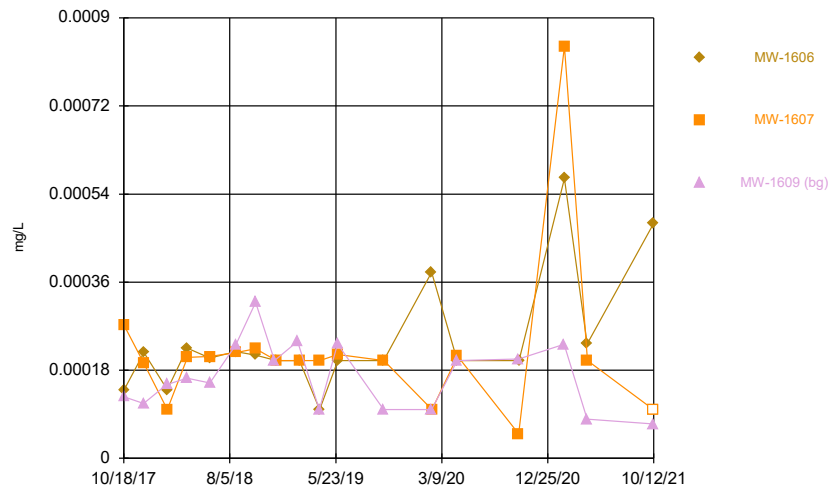
Constituent: Calcium total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



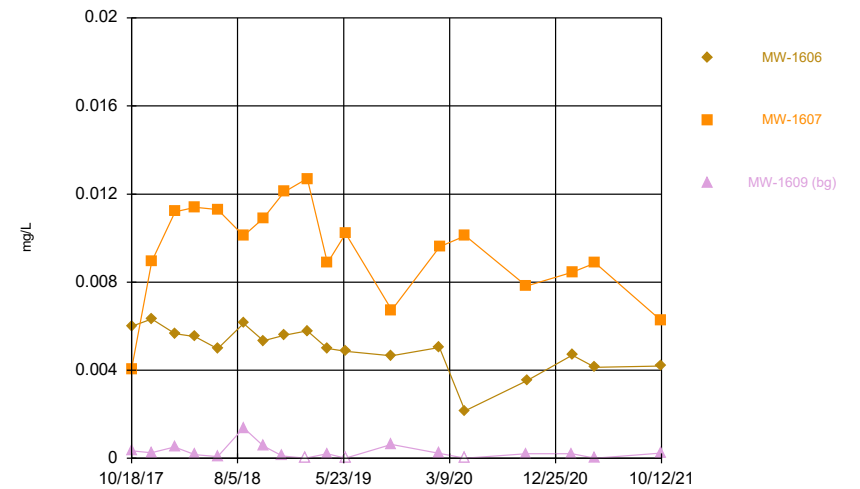
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Time Series



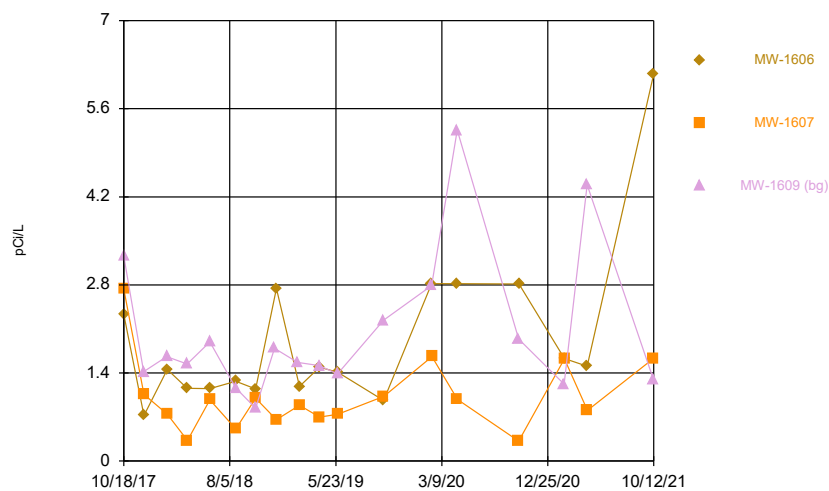
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Clinch River LF Client: AEP Data: Clinch River

Time Series



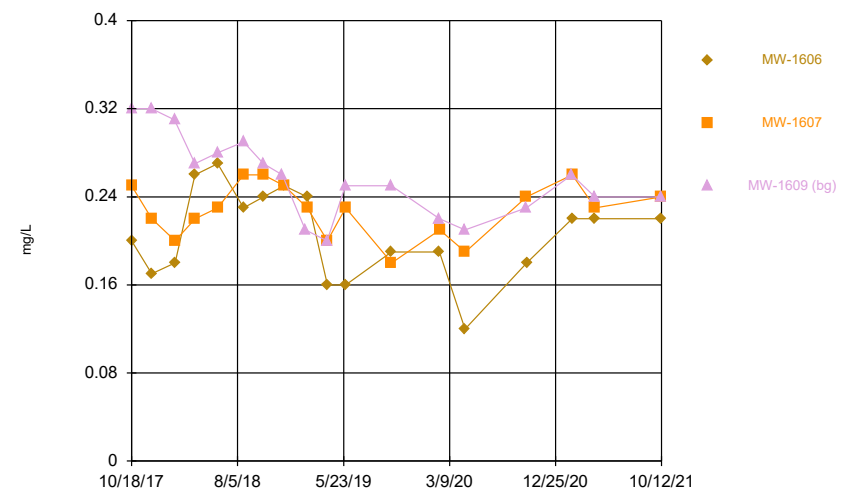
Constituent: Cobalt total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



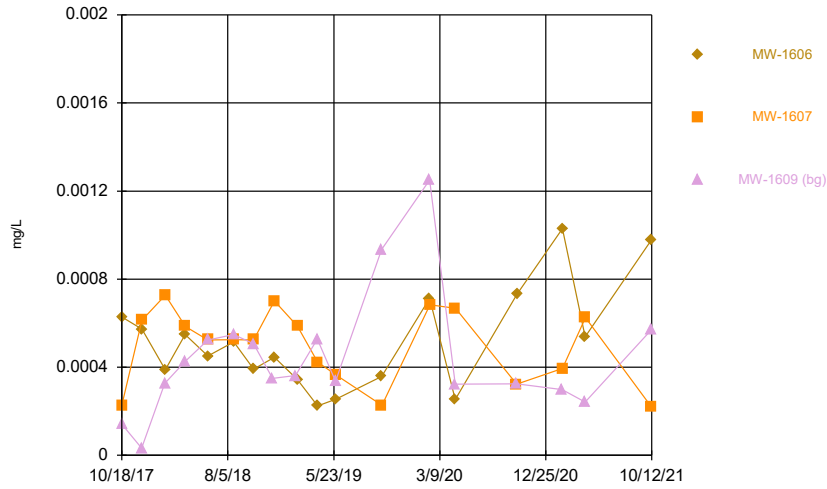
Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - P  
Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Fluoride total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

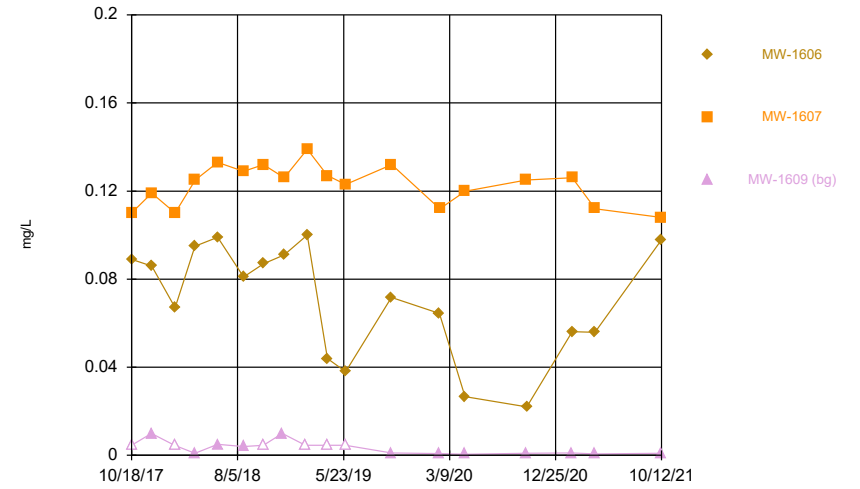
Time Series



Constituent: Lead total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

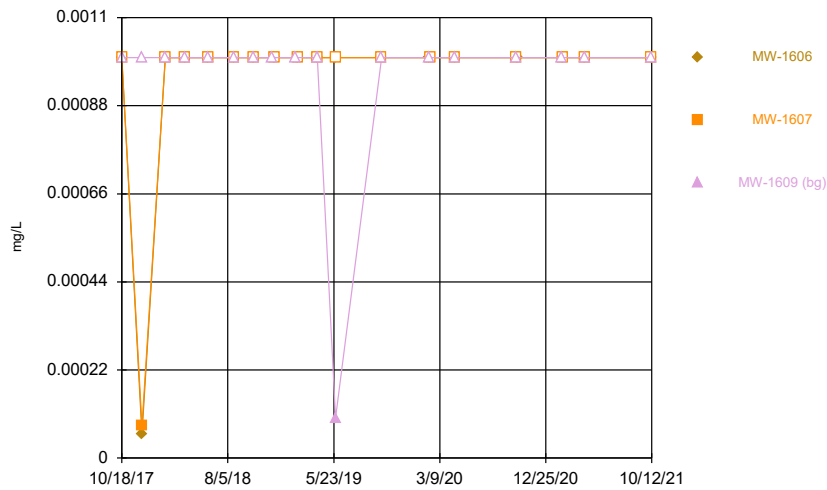
Time Series



Constituent: Lithium total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Hollow symbols indicate censored values.

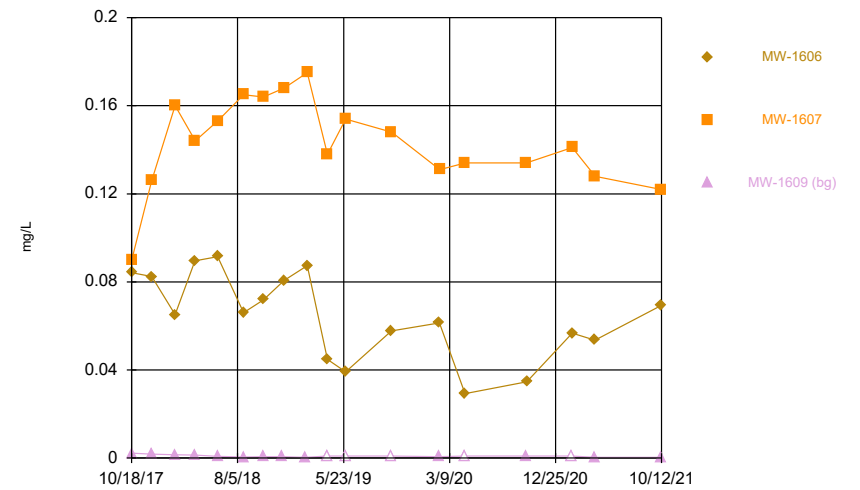
Time Series



Constituent: Mercury total Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

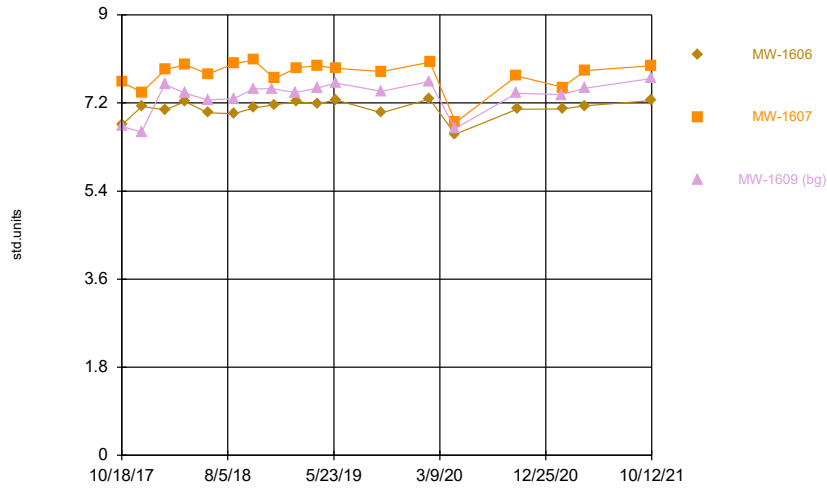
Hollow symbols indicate censored values.

Time Series



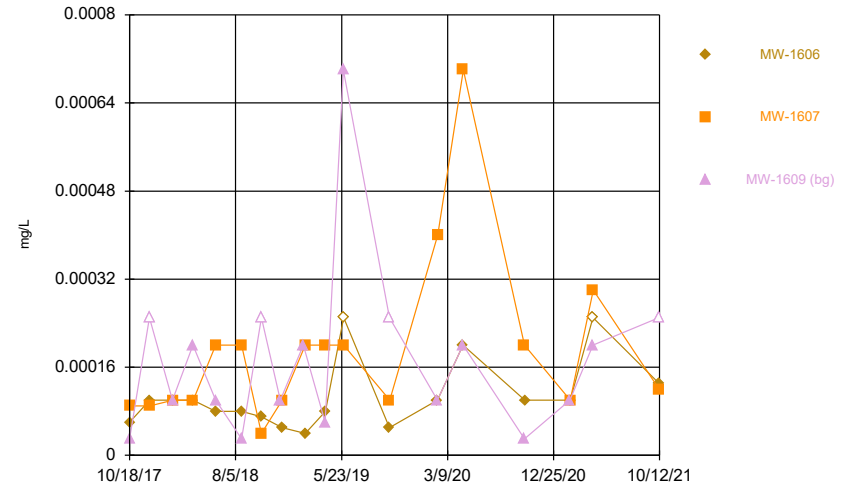
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Clinch River LF Client: AEP Data: Clinch River

Time Series



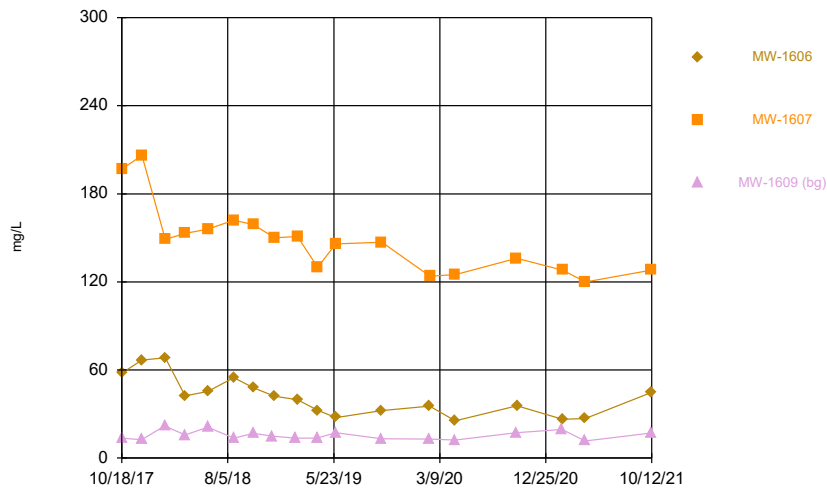
Constituent: pH [field] Analysis Run 1/26/2022 2:47 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



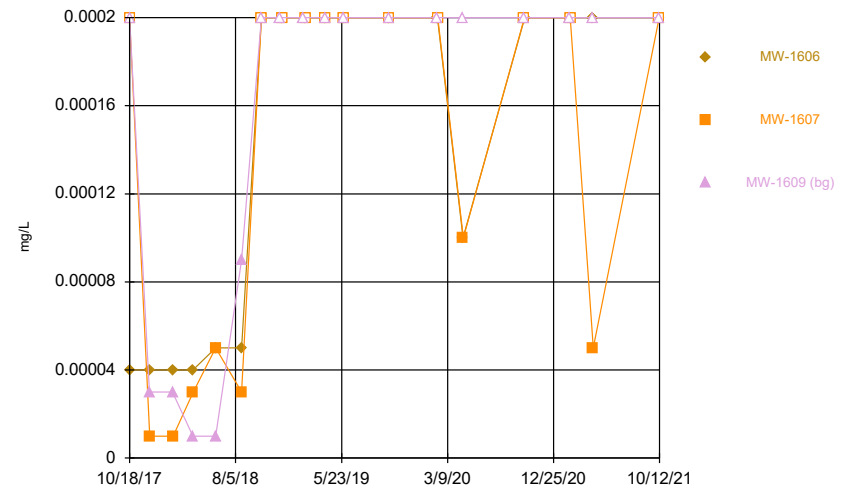
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Clinch River LF Client: AEP Data: Clinch River

Time Series



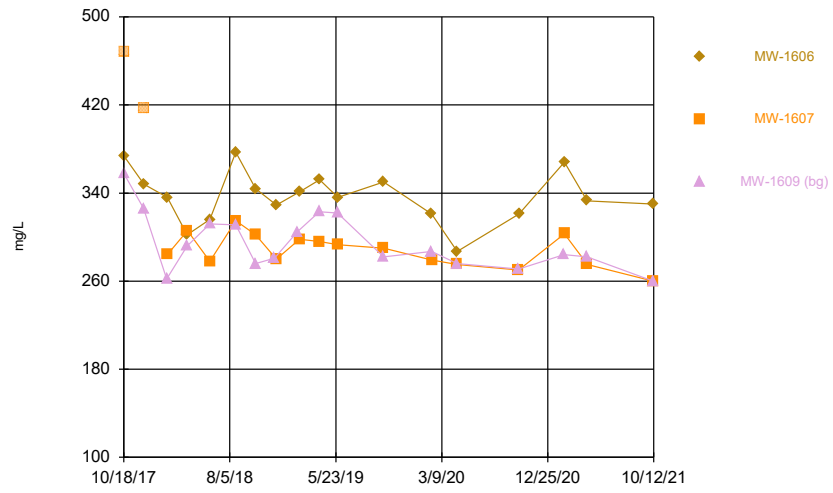
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Time Series



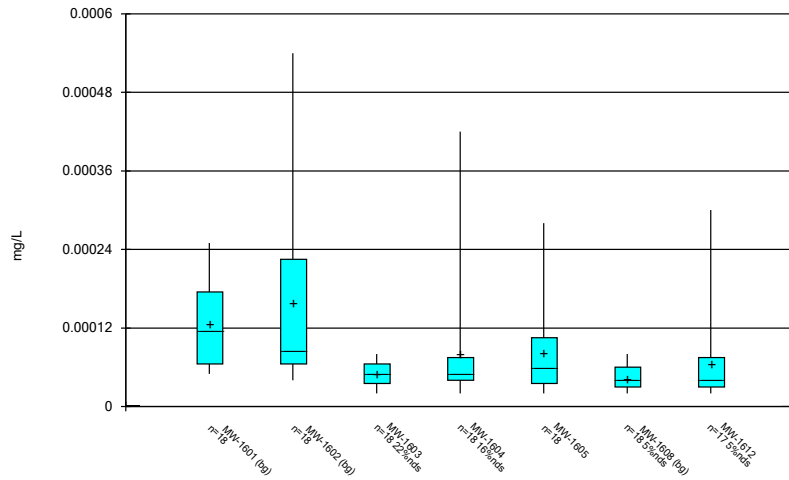
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### Time Series



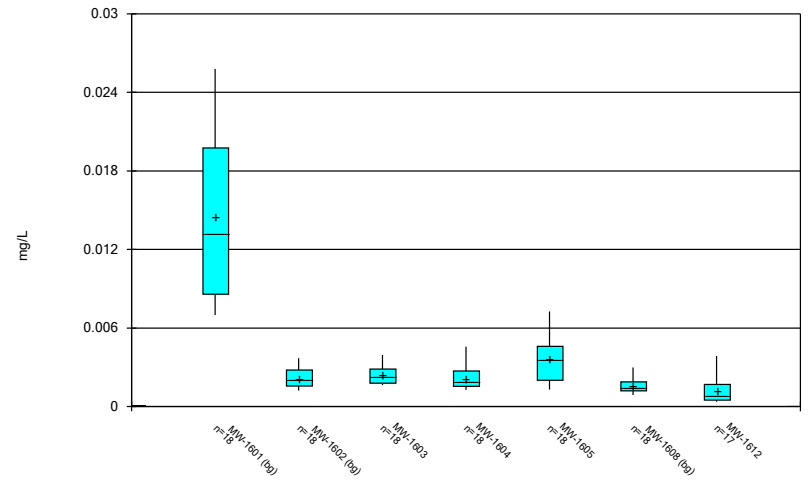
Constituent: Total Dissolved Solids    Analysis Run 1/26/2022 2:47 PM    View: Rome Limestone - Pond 1  
 Clinch River LF    Client: AEP    Data: Clinch River

Box & Whiskers Plot



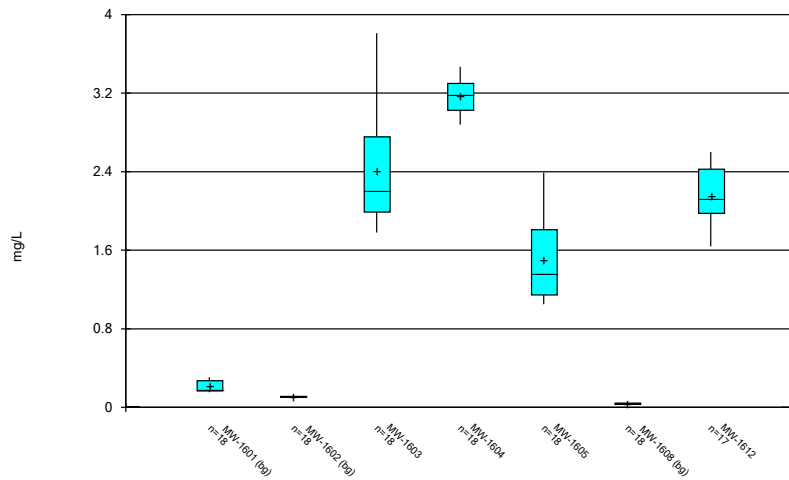
Constituent: Antimony total Analysis Run 1/26/2022 1:53 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



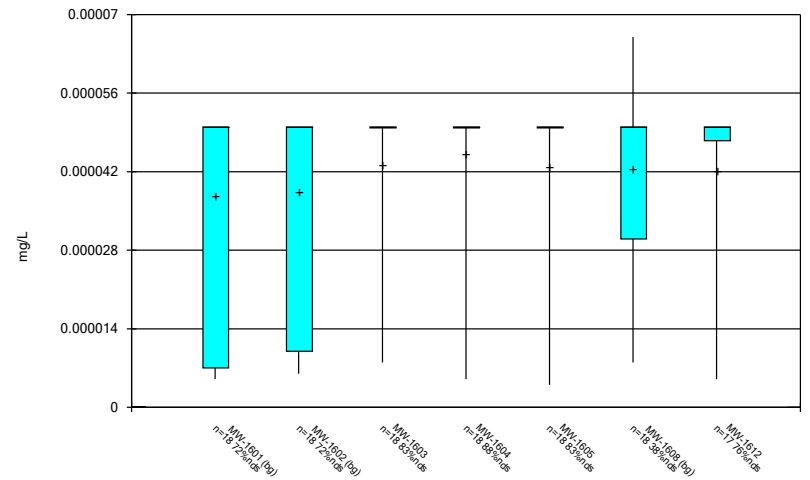
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Box & Whiskers Plot



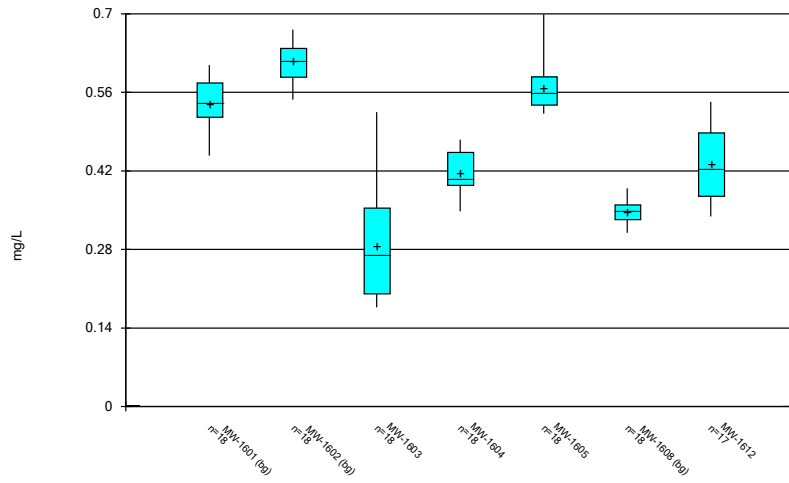
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Box & Whiskers Plot



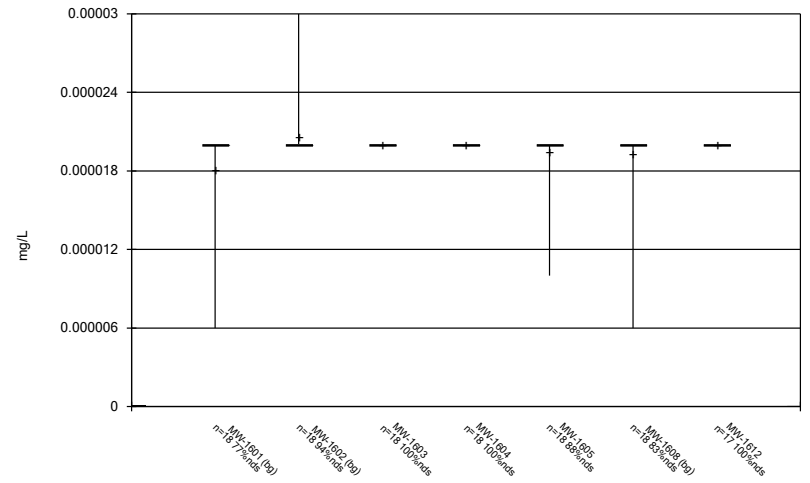
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



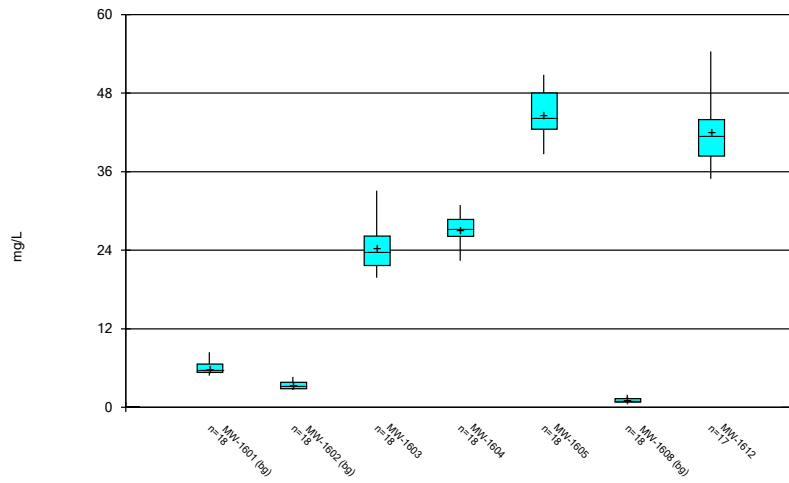
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



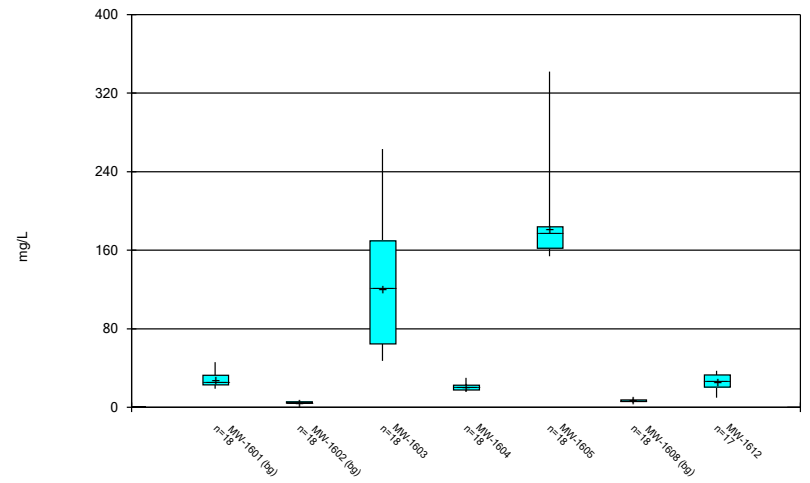
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Box & Whiskers Plot



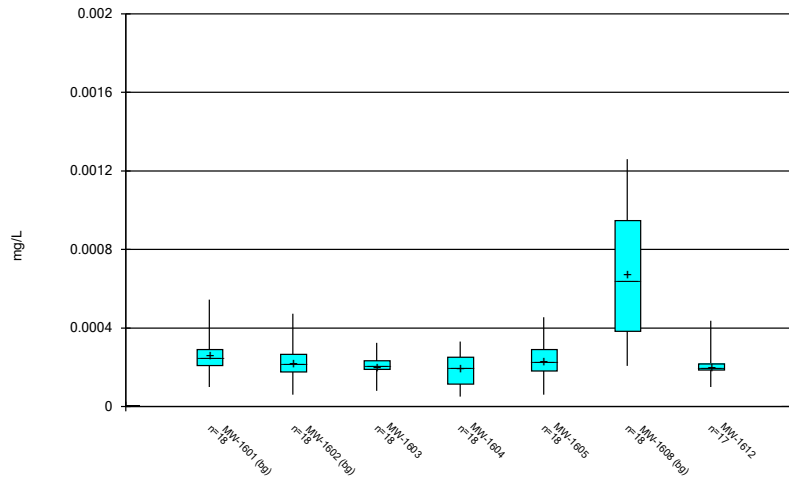
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



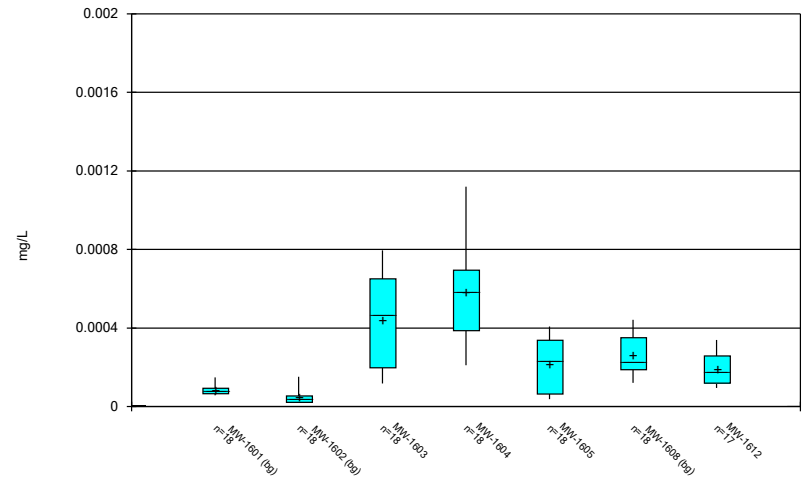
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Box & Whiskers Plot



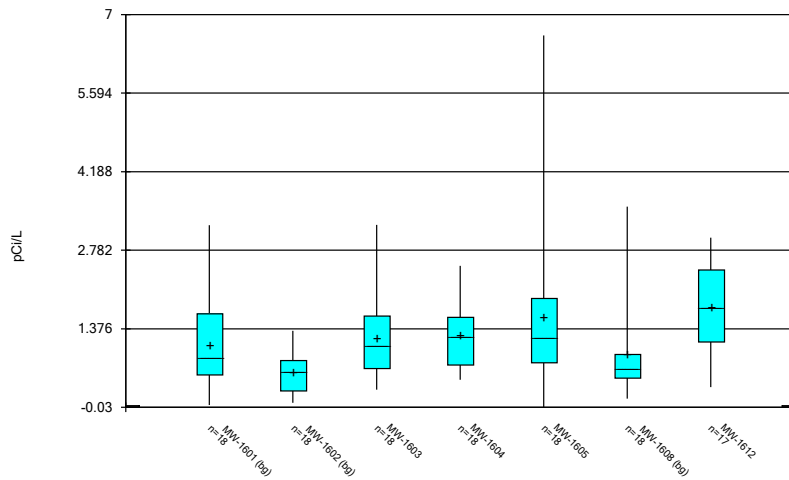
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Box & Whiskers Plot



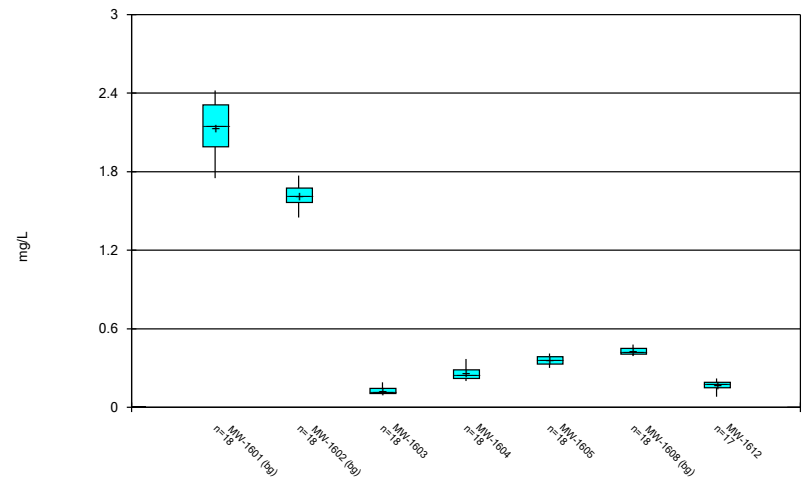
Constituent: Cobalt total Analysis Run 1/26/2022 1:53 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 1:53 PM View: Chattanooga Shale -  
Clinch River LF Client: AEP Data: Clinch River

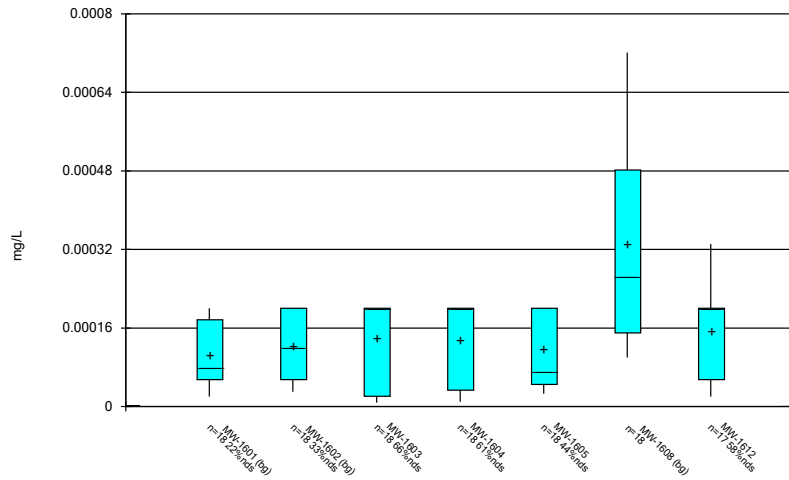
Box & Whiskers Plot



Constituent: Fluoride total Analysis Run 1/26/2022 1:53 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

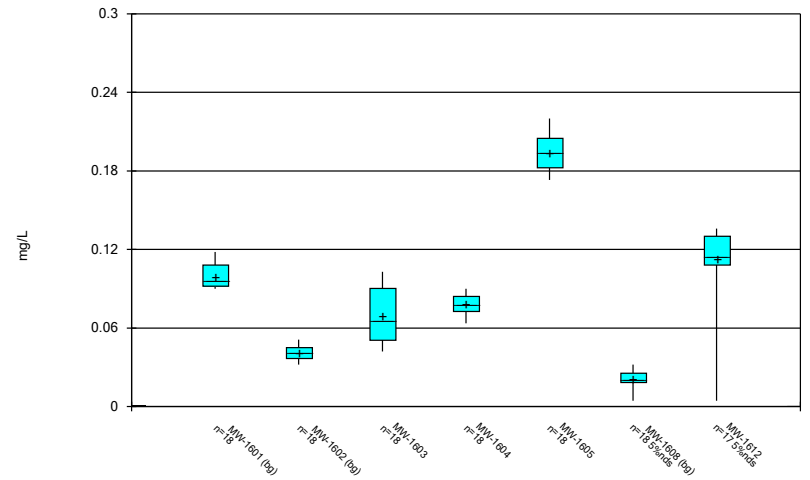


Box & Whiskers Plot



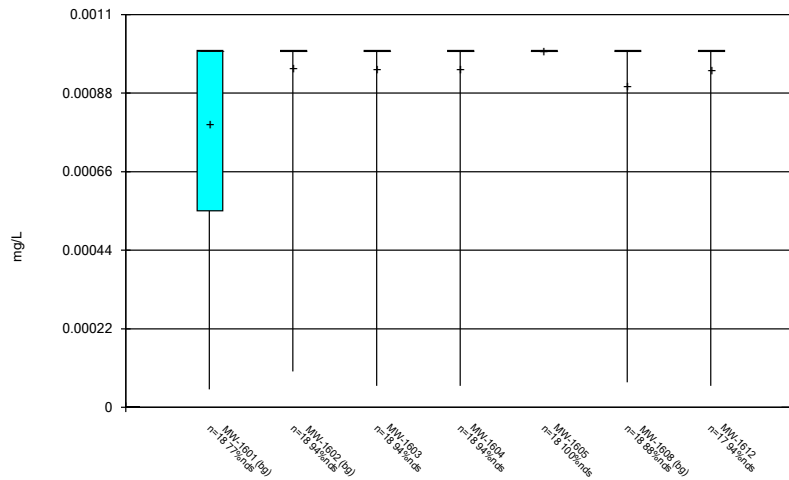
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



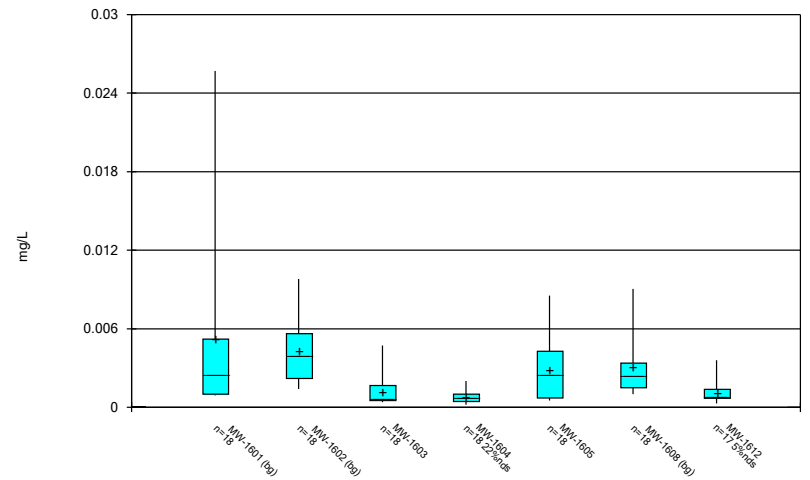
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



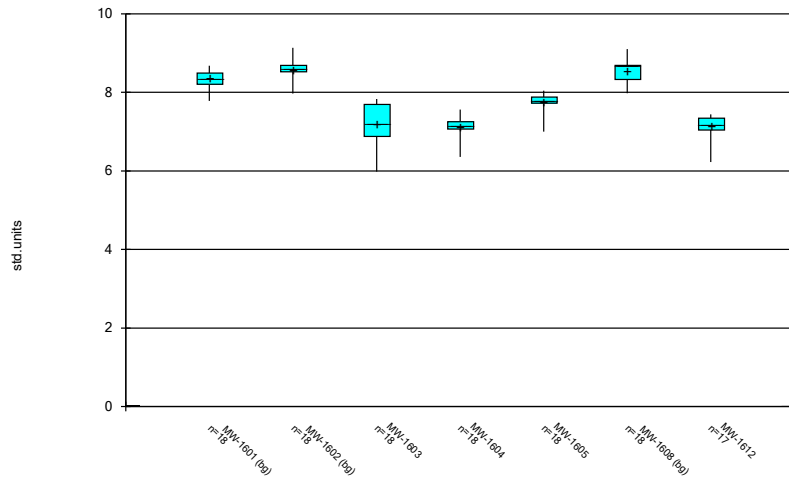
Constituent: Mercury total Analysis Run 1/26/2022 1:53 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



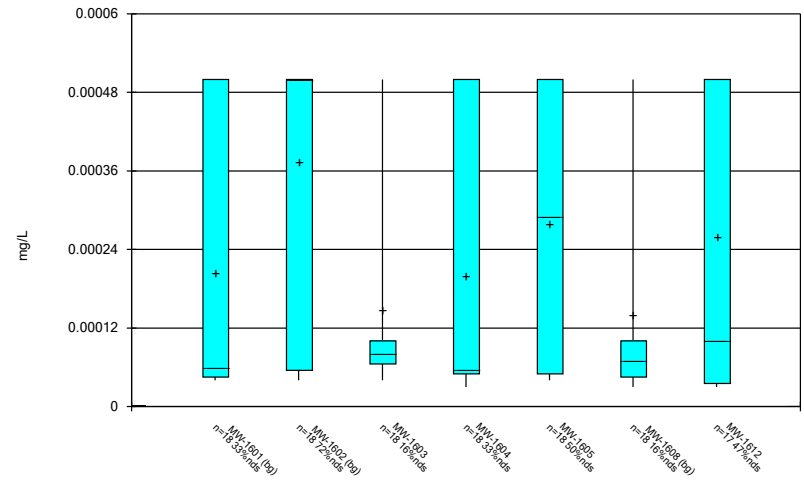
Constituent: Molybdenum total Analysis Run 1/26/2022 1:53 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



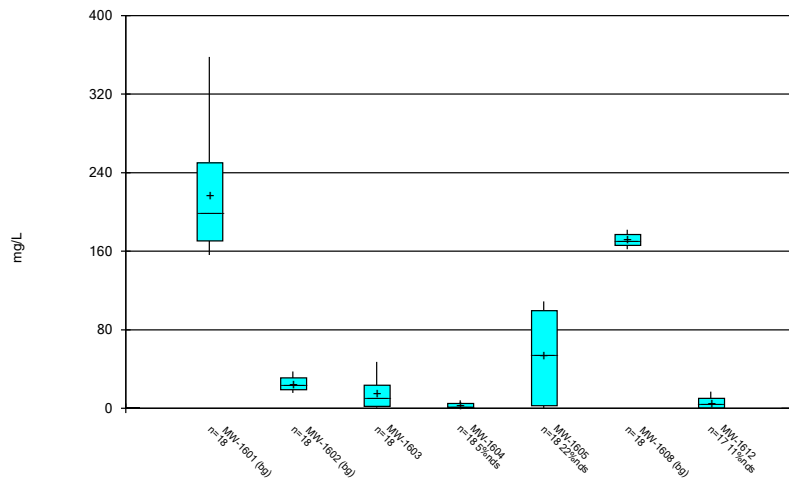
Constituent: pH [field] Analysis Run 1/26/2022 1:53 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



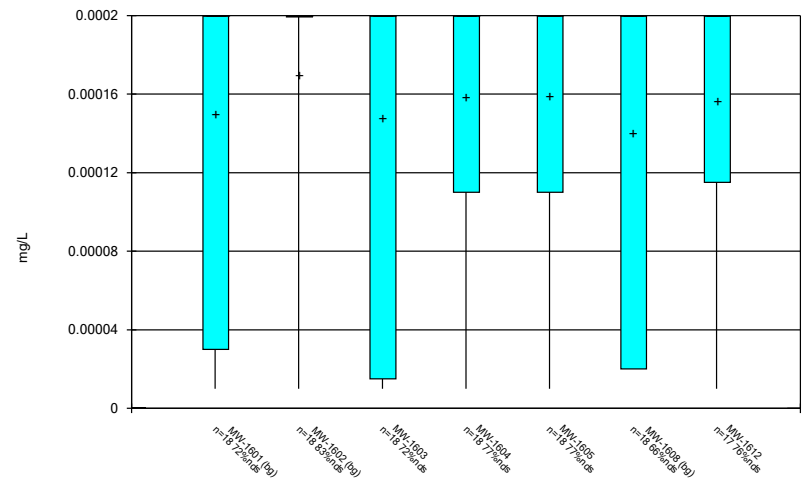
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



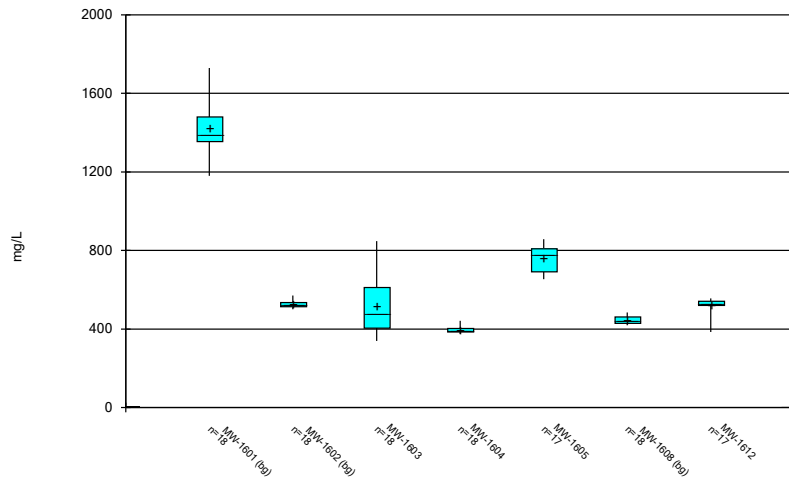
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Box & Whiskers Plot



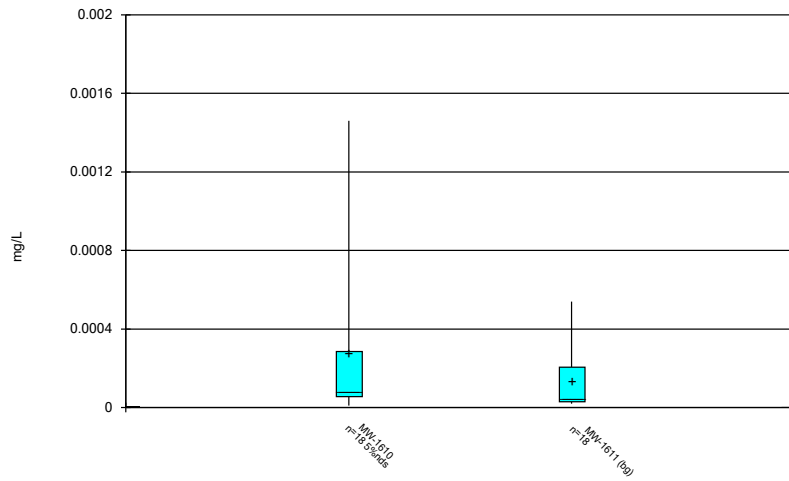
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



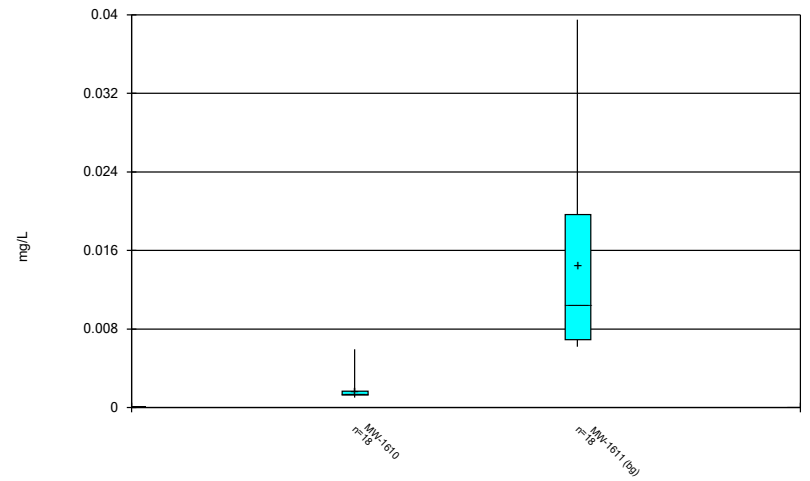
Constituent: Total Dissolved Solids    Analysis Run 1/26/2022 1:53 PM    View: Chattanooga Shale - Pond 1  
Clinch River LF    Client: AEP    Data: Clinch River

### Box & Whiskers Plot



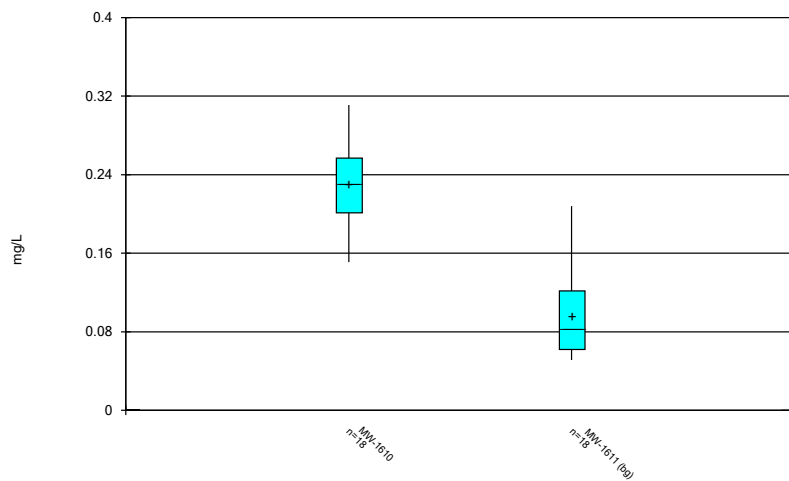
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



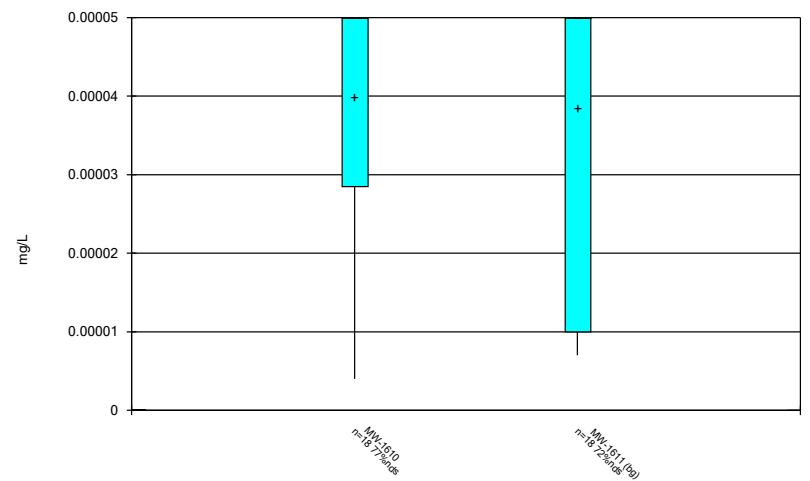
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



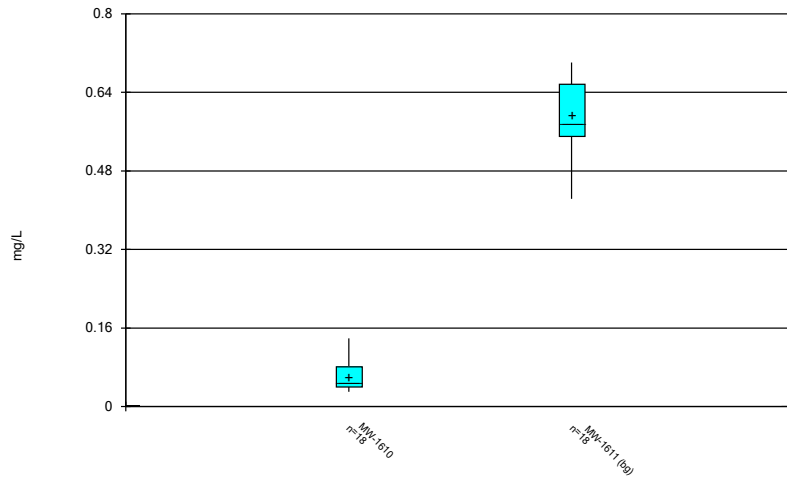
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



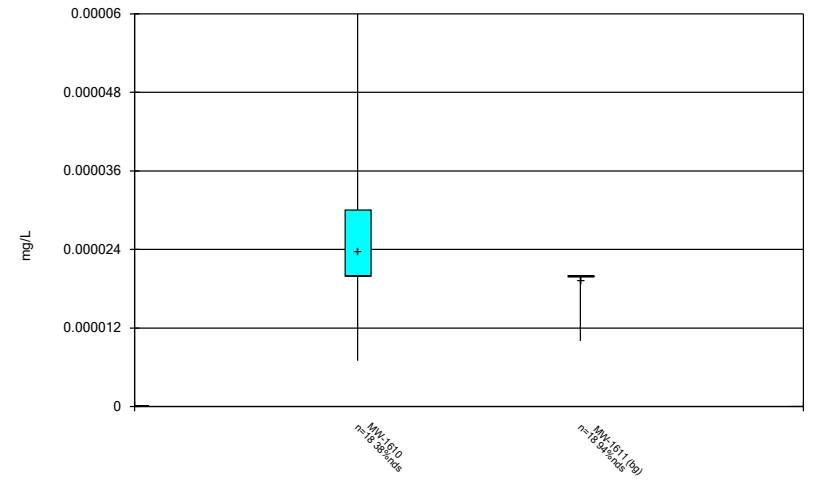
Constituent: Beryllium total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



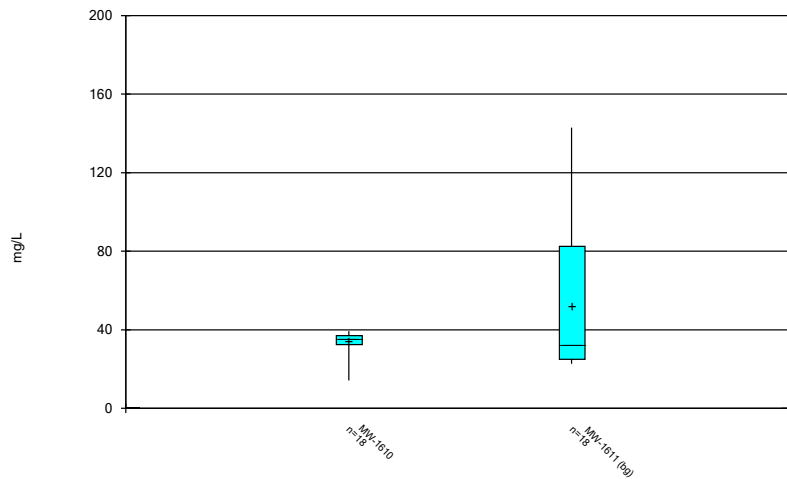
Constituent: Boron total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



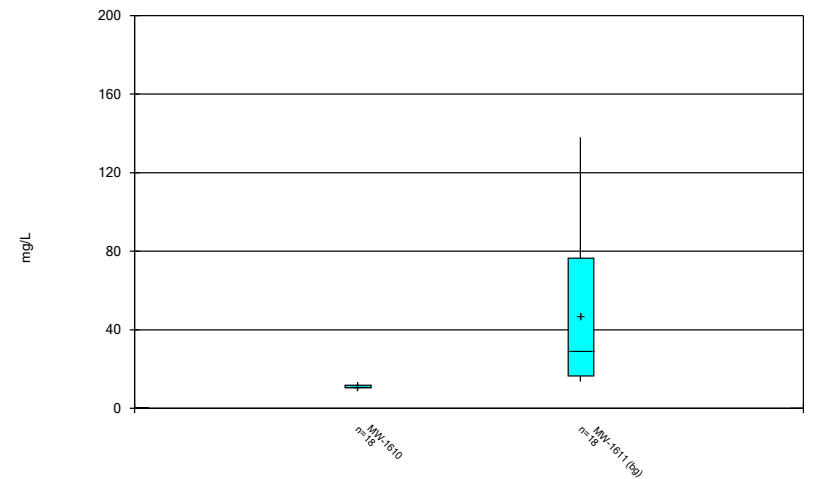
Constituent: Cadmium total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



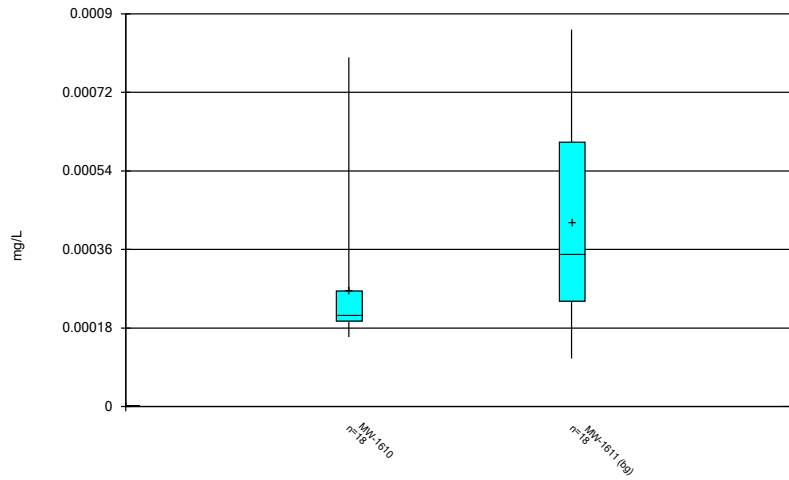
Constituent: Calcium total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



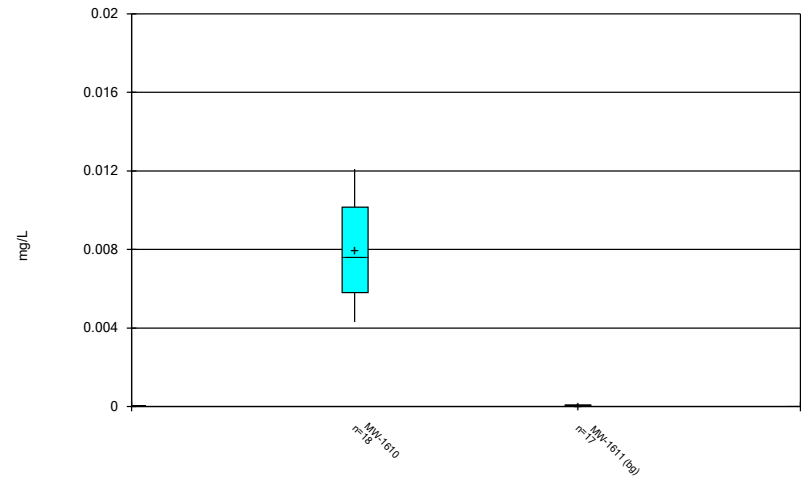
Constituent: Chloride total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



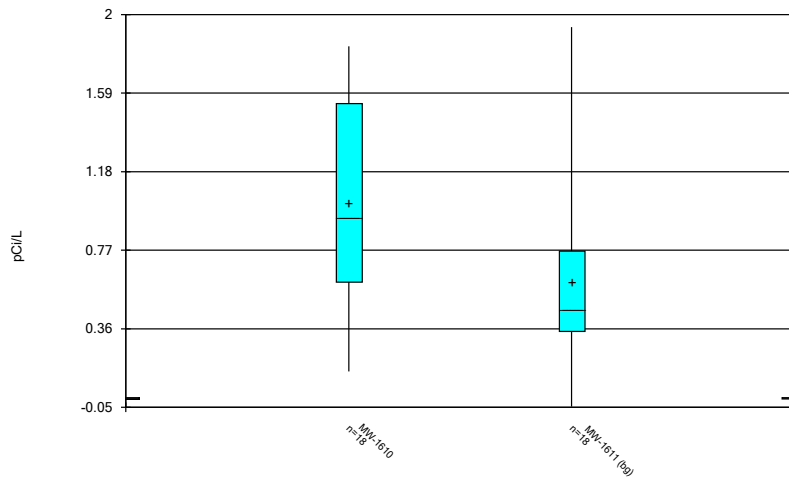
Constituent: Chromium total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



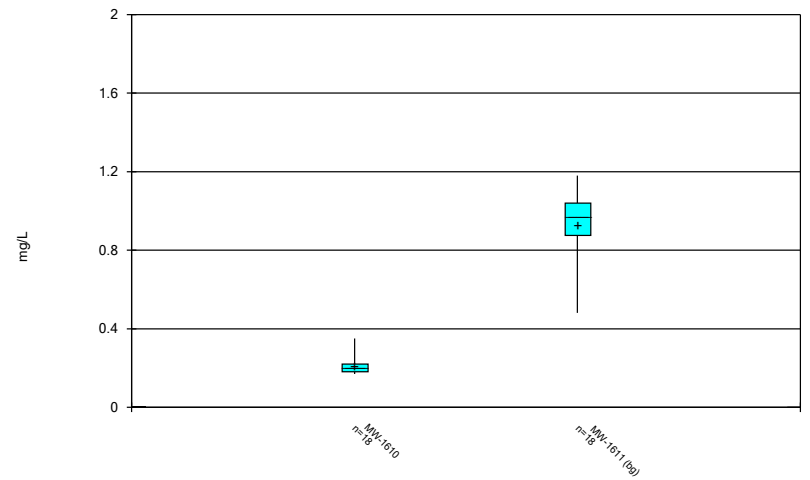
Constituent: Cobalt total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



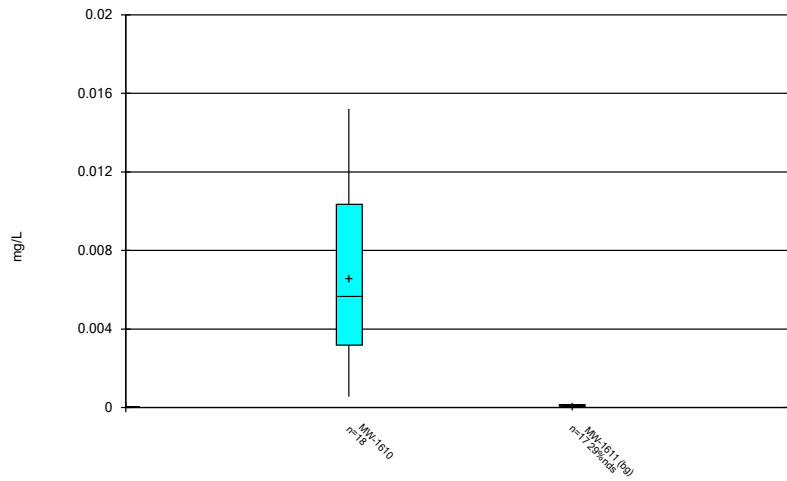
Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



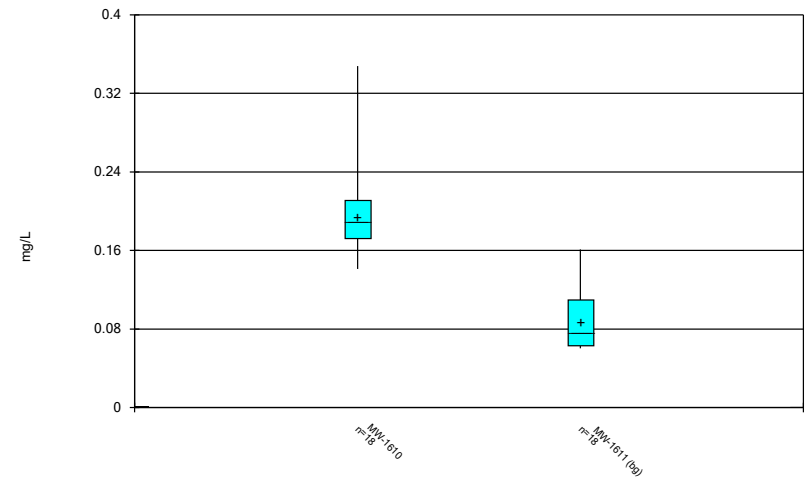
Constituent: Fluoride total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



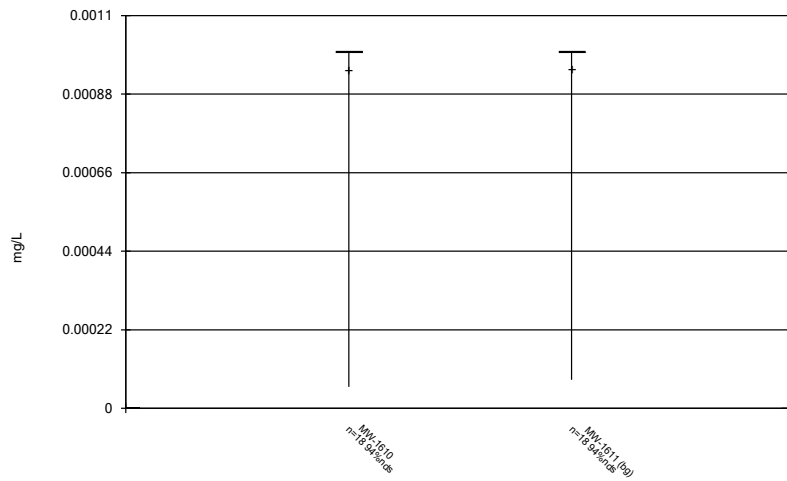
Constituent: Lead total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



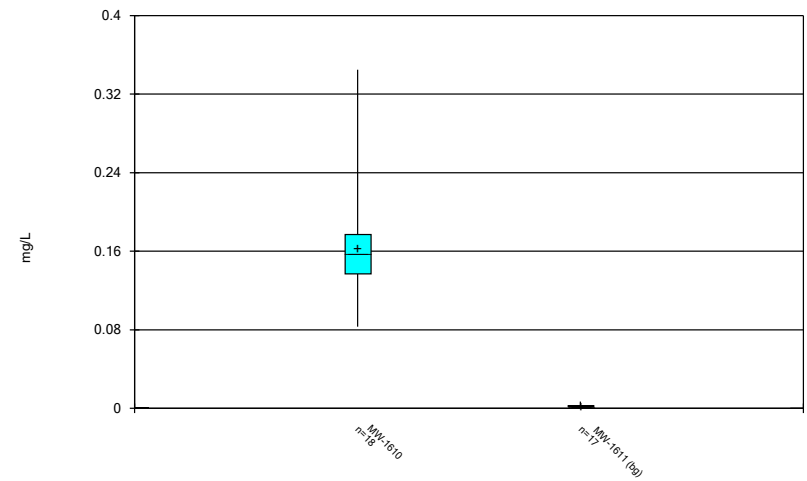
Constituent: Lithium total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



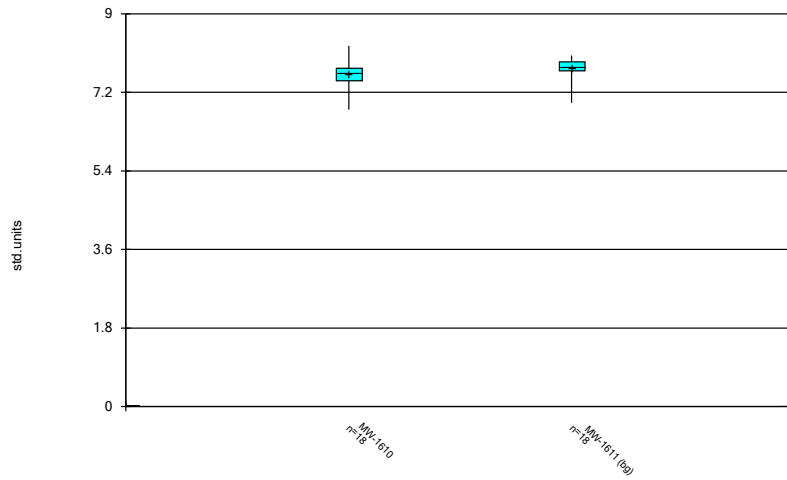
Constituent: Mercury total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



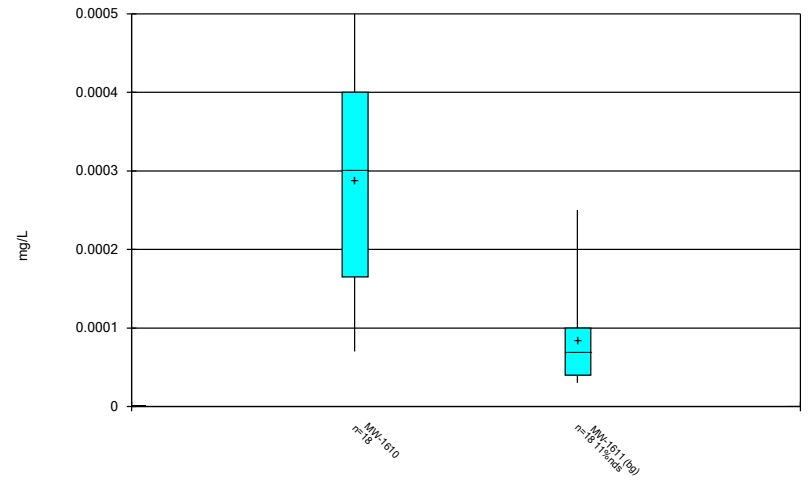
Constituent: Molybdenum total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



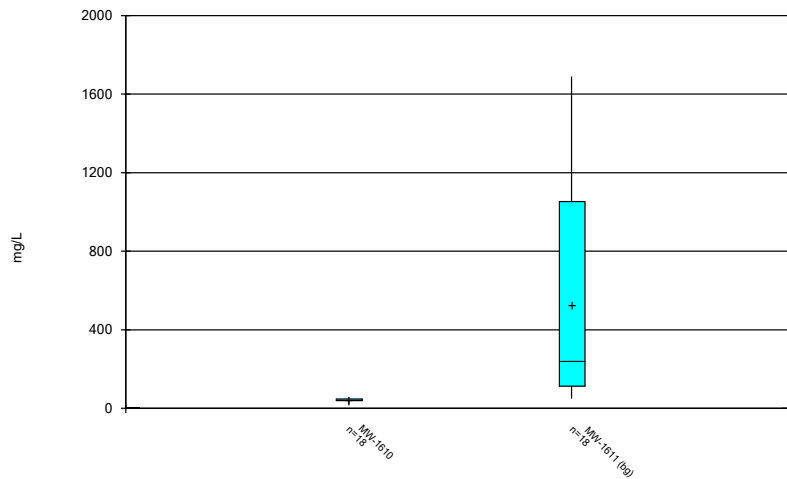
Constituent: pH [field] Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



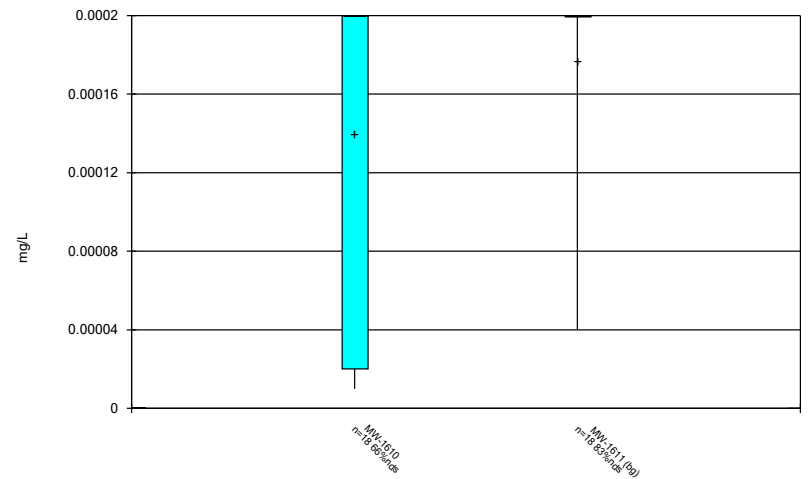
Constituent: Selenium total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



Constituent: Sulfate total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

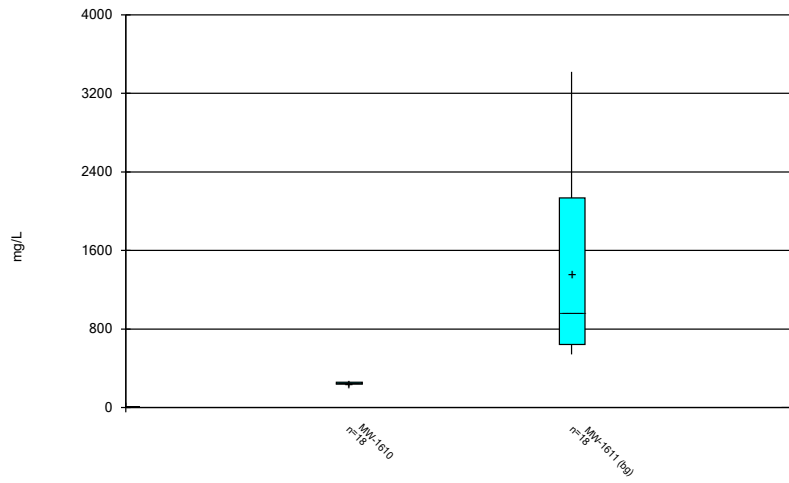
### Box & Whiskers Plot



Constituent: Thallium total Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

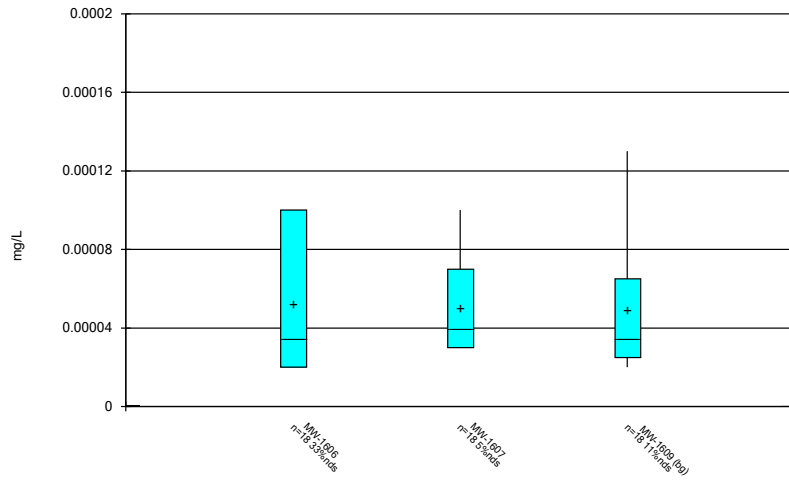


### Box & Whiskers Plot



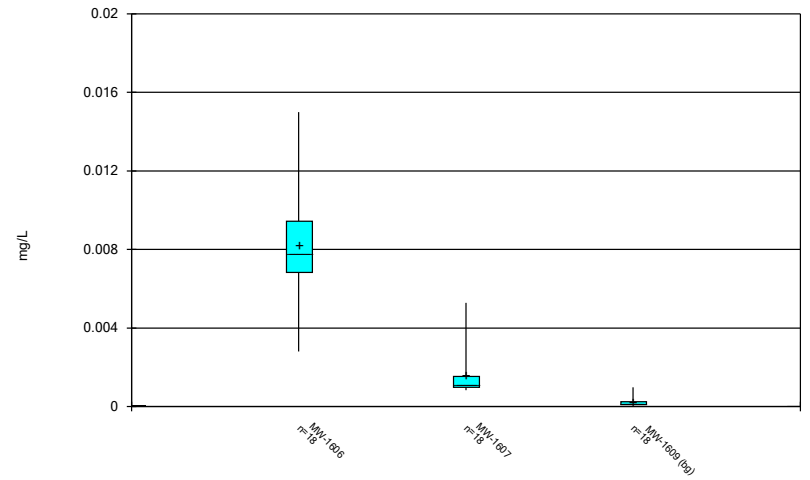
Constituent: Total Dissolved Solids Analysis Run 1/26/2022 10:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



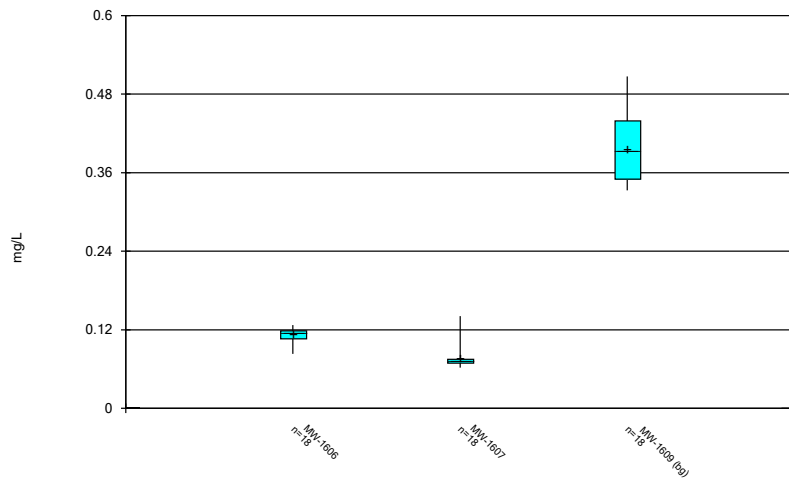
Constituent: Antimony total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



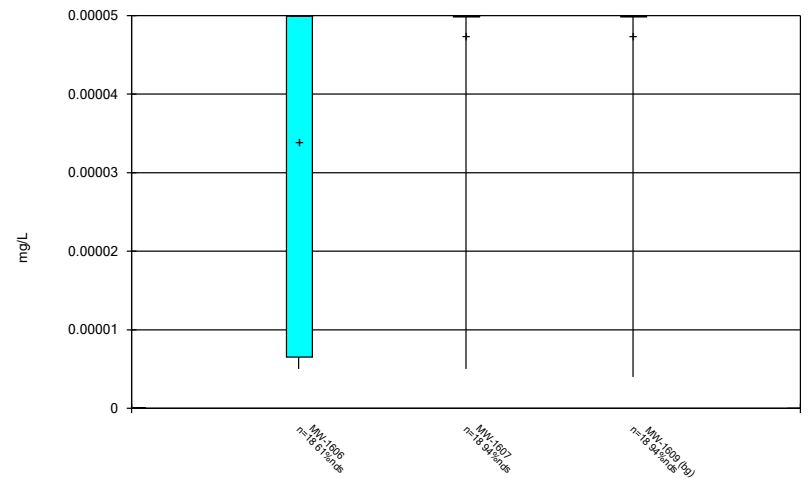
Constituent: Arsenic total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



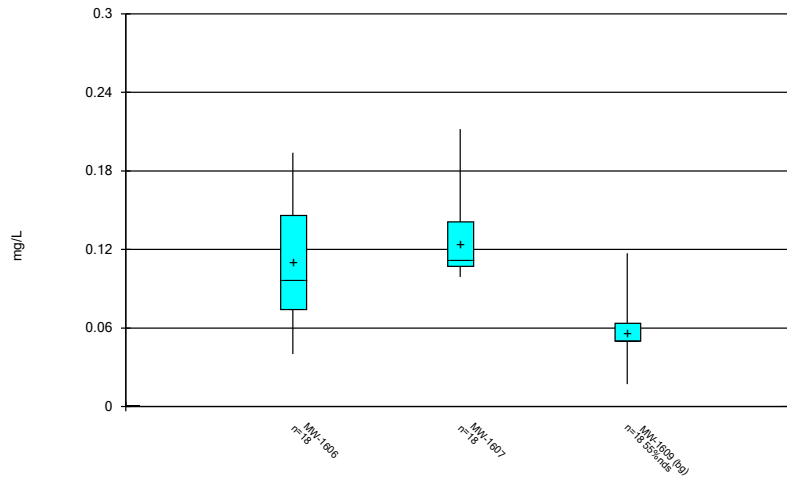
Constituent: Barium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



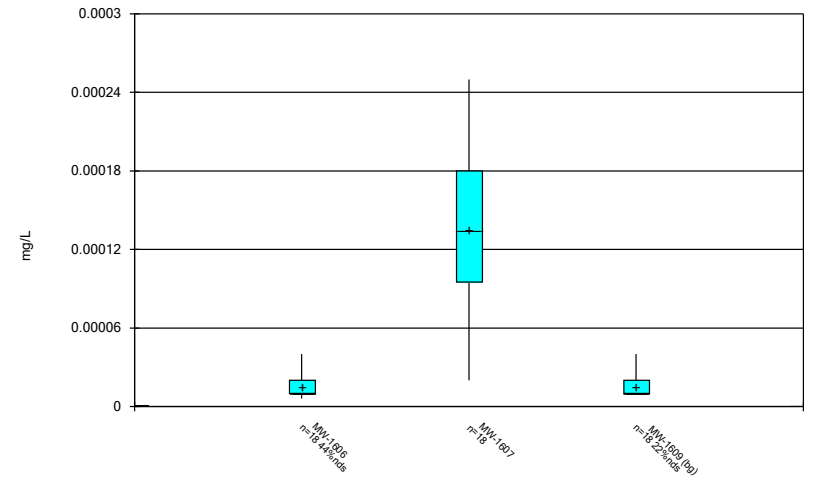
Constituent: Beryllium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



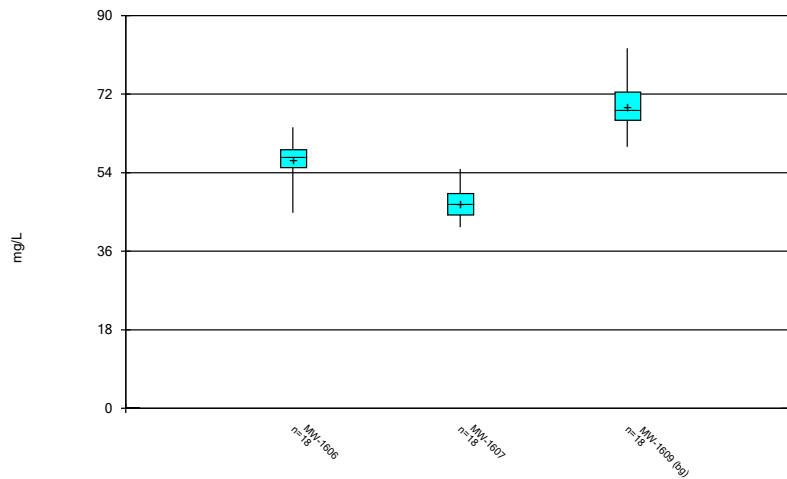
Constituent: Boron total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



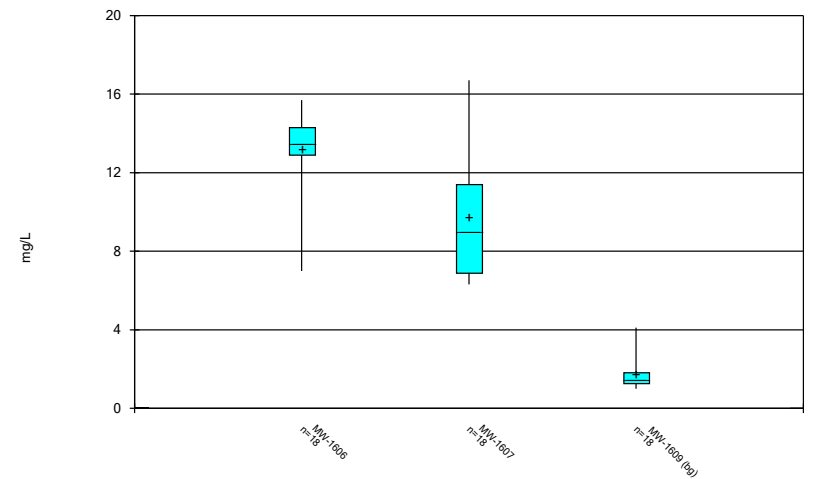
Constituent: Cadmium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



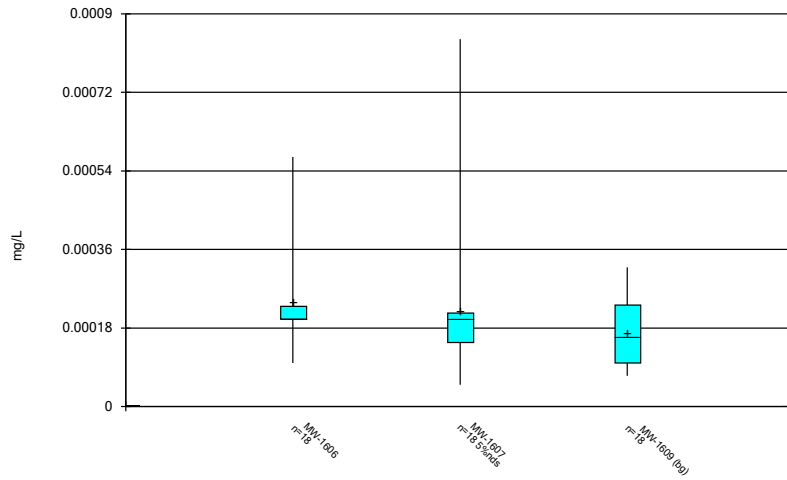
Constituent: Calcium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



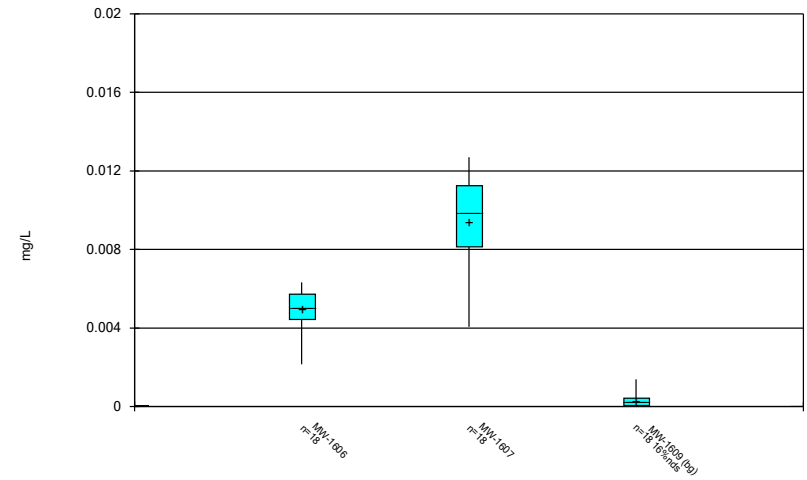
Constituent: Chloride total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



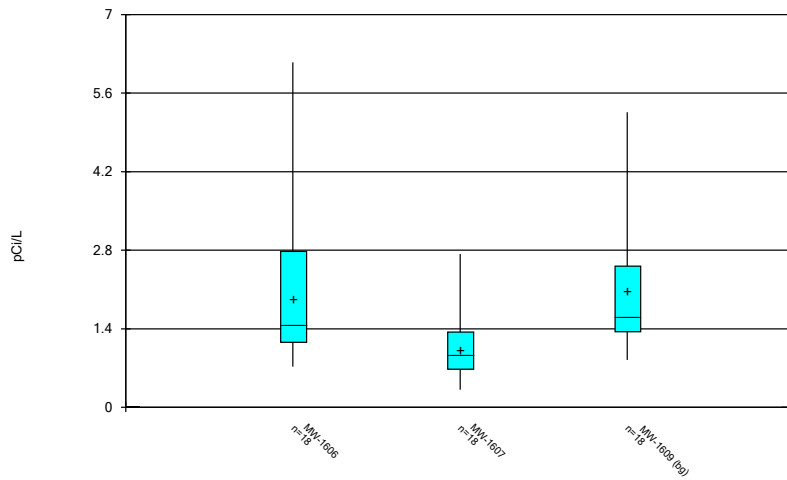
Constituent: Chromium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



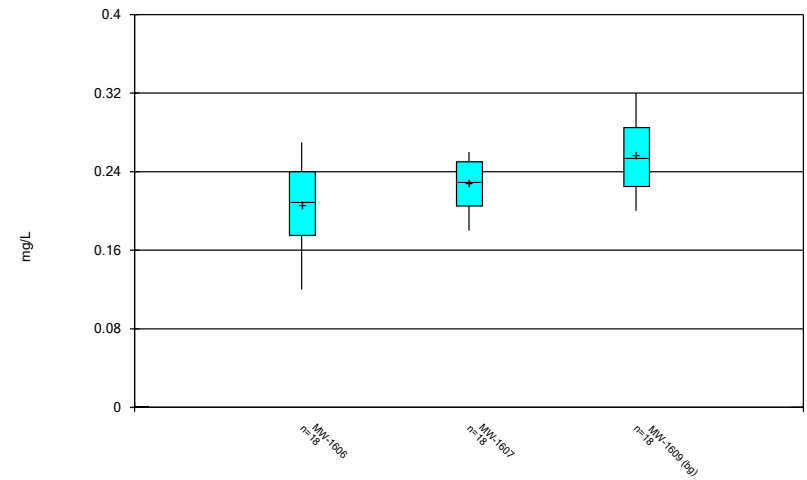
Constituent: Cobalt total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



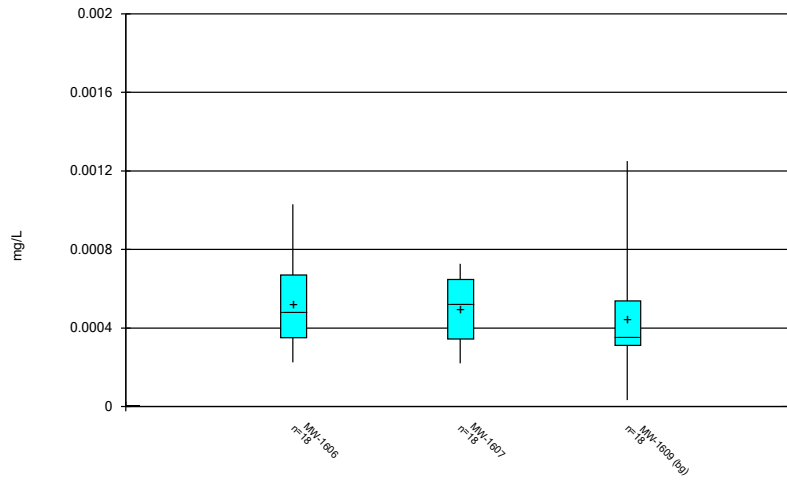
Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - P  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



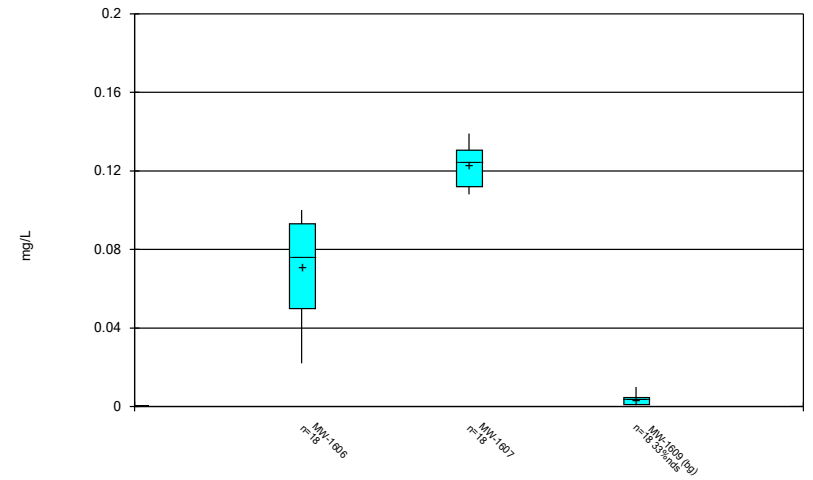
Constituent: Fluoride total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



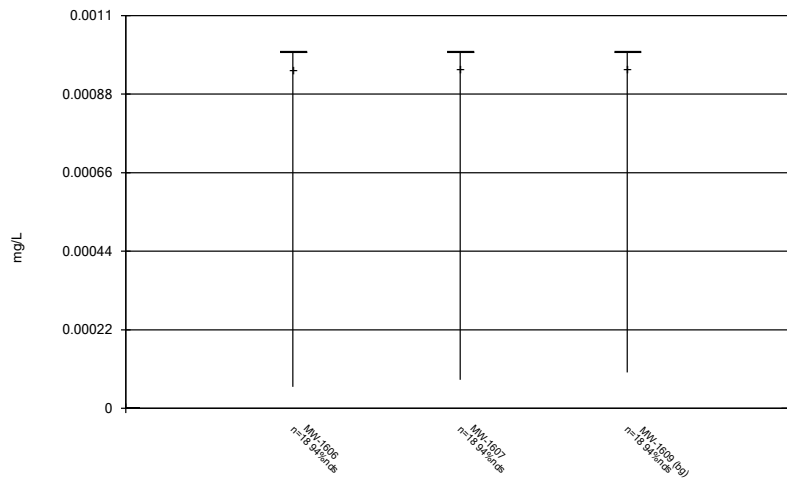
Constituent: Lead total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



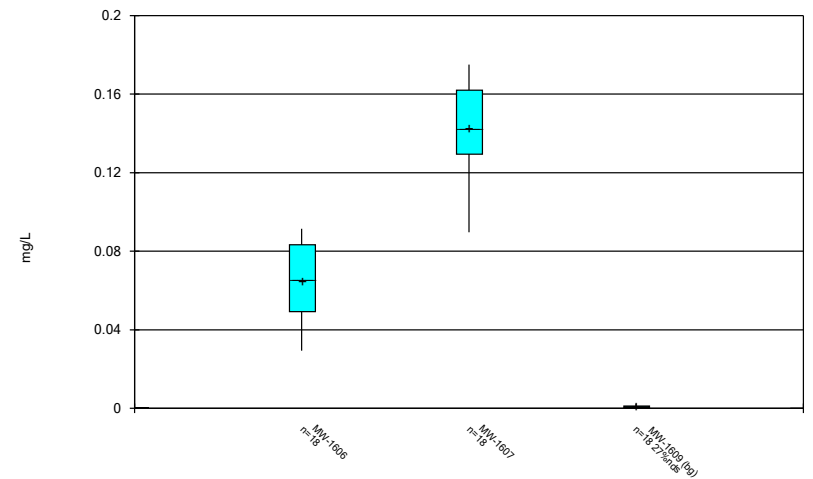
Constituent: Lithium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



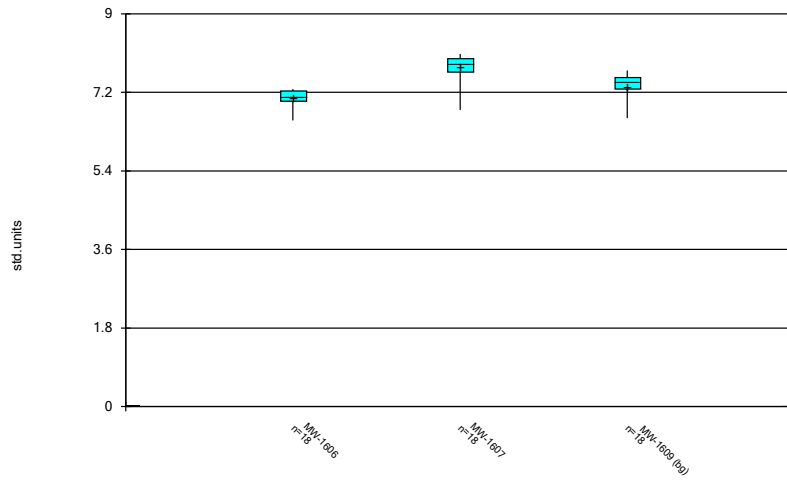
Constituent: Mercury total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



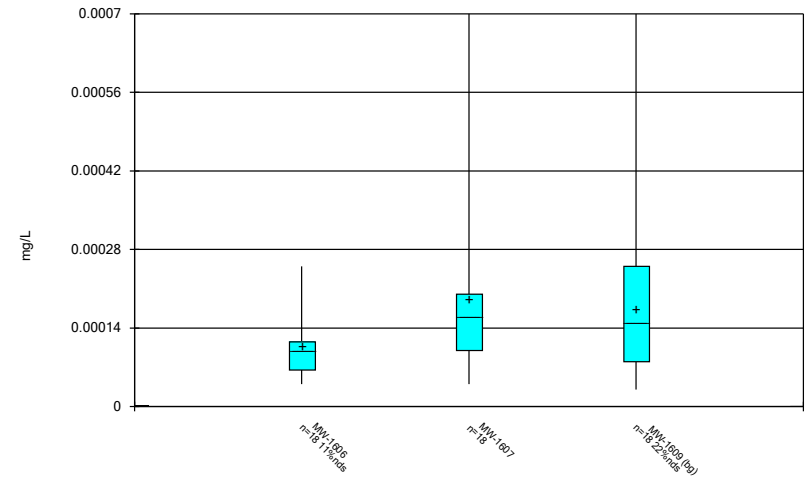
Constituent: Molybdenum total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



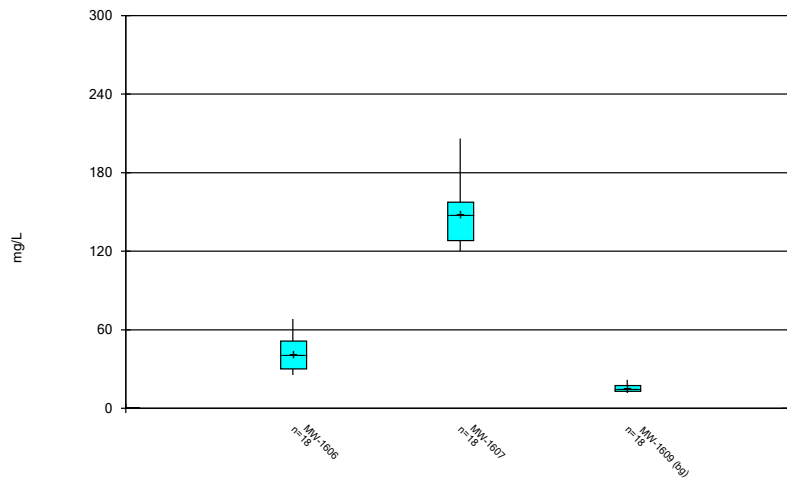
Constituent: pH [field] Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



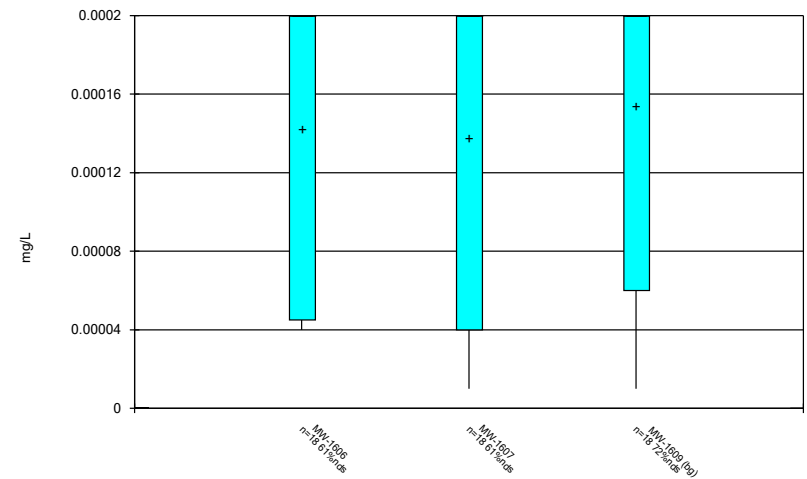
Constituent: Selenium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



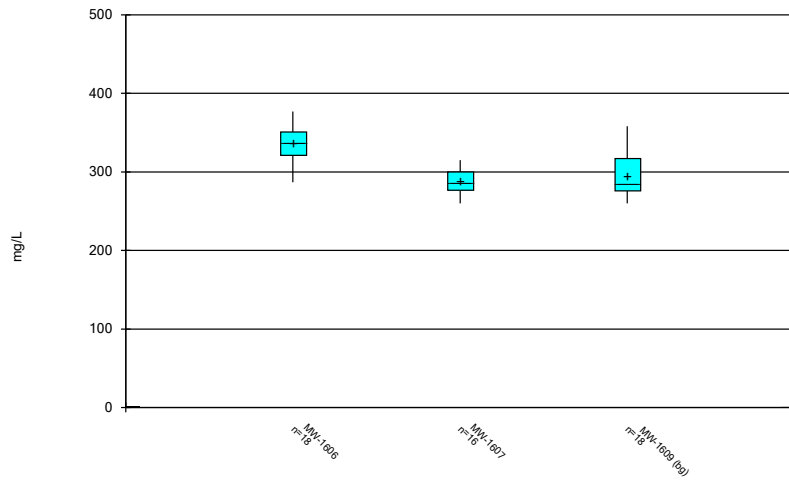
Constituent: Sulfate total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Thallium total Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



Constituent: Total Dissolved Solids Analysis Run 1/26/2022 2:48 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

# Chattanooga Shale - Outlier Summary

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 1:50 PM

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MW-1605 Total Dissolved Solids (mg/L)

4/11/2018

1700 (o)



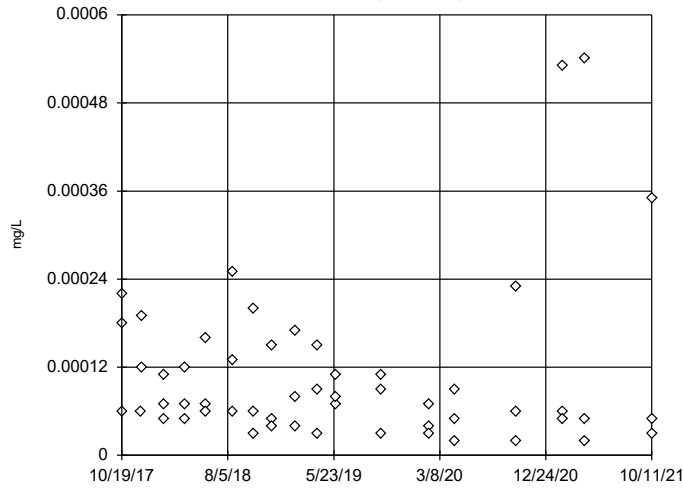
# Tukey's Outlier Test - Upgradient Wells (Chattanooga) - All Results (No Significant)

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 1:59 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	54	0.0001093	0.0001081	ln(x)	ShapiroFrancia
Arsenic total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.006054	0.006993	ln(x)	ShapiroFrancia
Barium total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.118	0.08008	x^(1/3)	ShapiroFrancia
Beryllium total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.00003959	0.00001807	x^2	ShapiroFrancia
Cadmium total (mg/L)	MW-1601,MW-1602,M...	n/a	n/a	NP	NaN	54	0.00001928	0.000003595	unknown	ShapiroFrancia
Calcium total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	3.48	2.101	sqrt(x)	ShapiroFrancia
Chloride total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	13.12	11.49	ln(x)	ShapiroFrancia
Chromium total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.0003842	0.0002849	ln(x)	ShapiroFrancia
Cobalt total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.0001292	0.0001122	ln(x)	ShapiroFrancia
Combined Radium 226 and 228 (pCi/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.8655	0.7532	x^(1/3)	ShapiroFrancia
Fluoride total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	1.395	0.7324	x^2	ShapiroFrancia
Lead total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.0001862	0.0001639	ln(x)	ShapiroFrancia
Lithium total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.05343	0.03406	x^(1/3)	ShapiroFrancia
Mercury total (mg/L)	MW-1601,MW-1602,M...	n/a	n/a	NP	NaN	54	0.0008806	0.0003125	unknown	ShapiroFrancia
Molybdenum total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.004164	0.004654	ln(x)	ShapiroFrancia
pH [field] (std.units)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	8.496	0.2652	x^4	ShapiroFrancia
Selenium total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.0002389	0.0002191	ln(x)	ShapiroFrancia
Thallium total (mg/L)	MW-1601,MW-1602,M...	No	n/a	NP	NaN	54	0.0001533	0.00007974	ln(x)	ShapiroFrancia

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

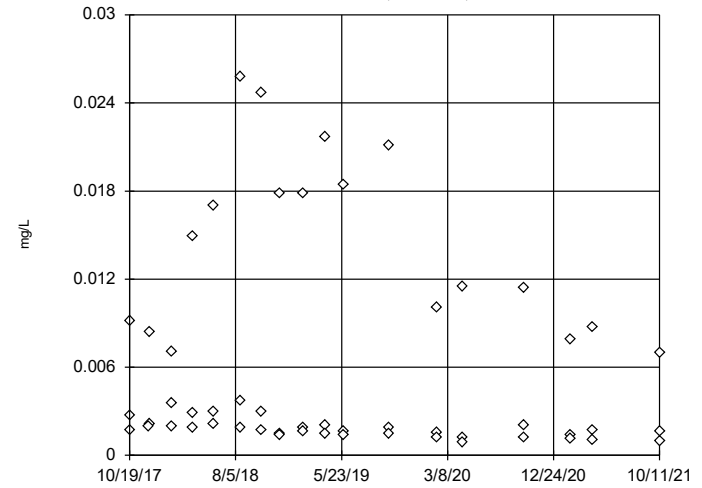


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.003042, low cutoff = 0.00002295, based on IQR multiplier of 3.

Constituent: Antimony total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

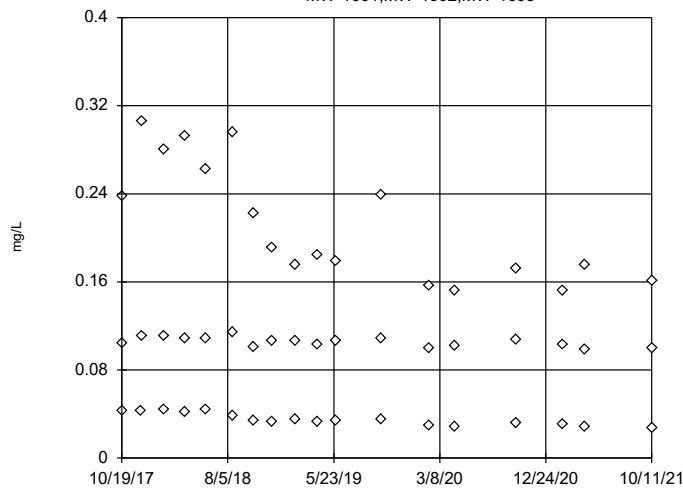


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.902, low cutoff = 0.000007101, based on IQR multiplier of 3.

Constituent: Arsenic total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

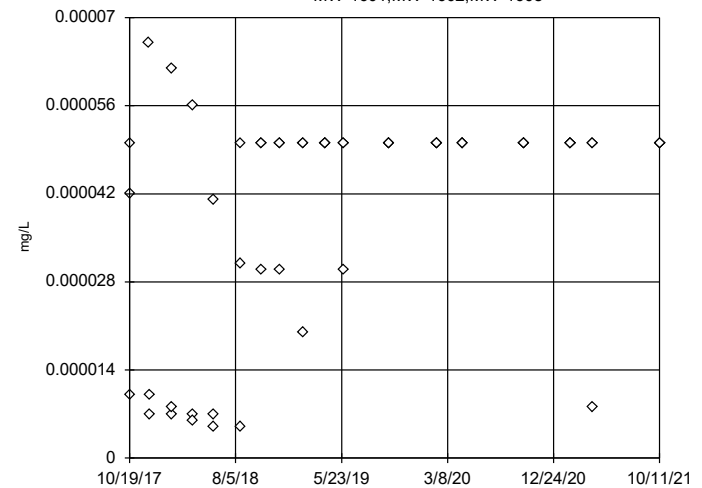


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.754, low cutoff = -0.02849, based on IQR multiplier of 3.

Constituent: Barium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

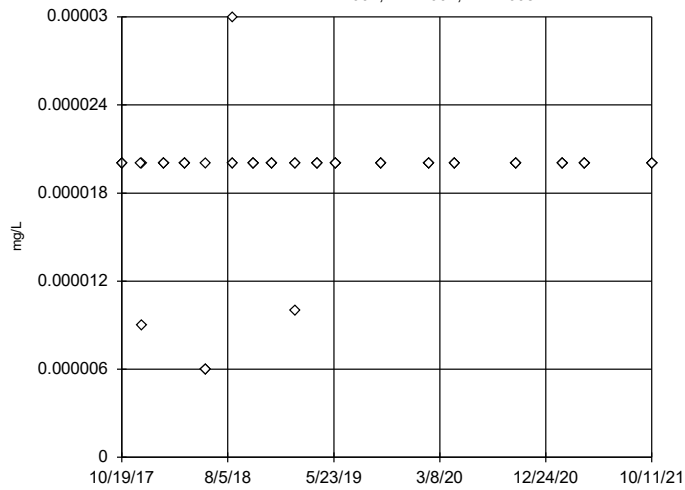


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.00008544, low cutoff = -0.00006245, based on IQR multiplier of 3.

Constituent: Beryllium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

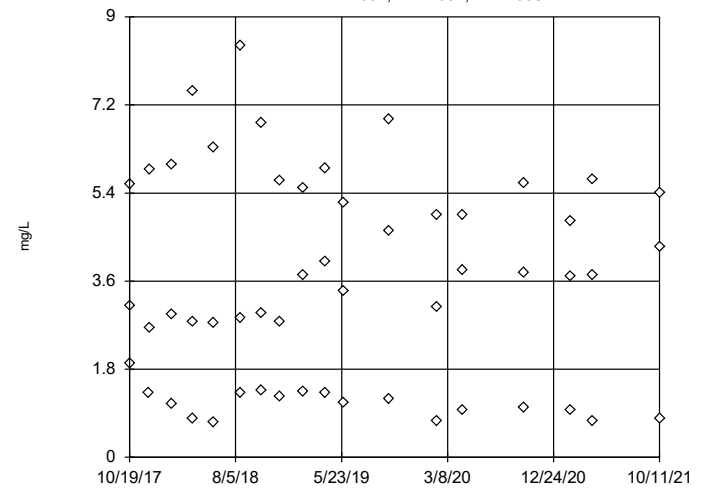


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

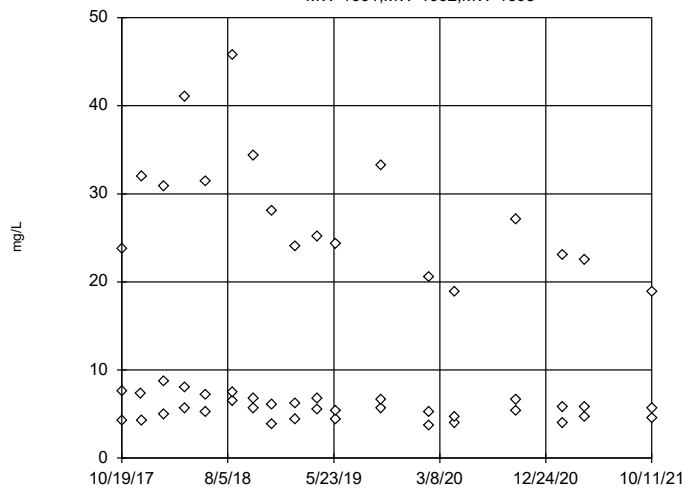


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 34.86, low cutoff = -5.882, based on IQR multiplier of 3.

Constituent: Calcium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

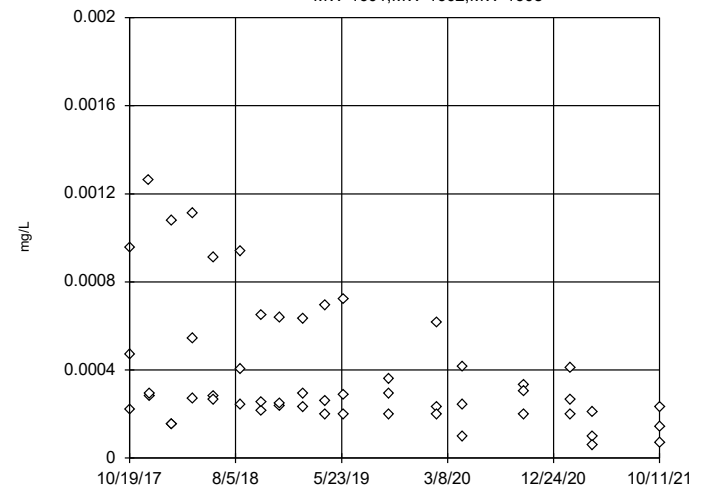


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 2150, low cutoff = 0.05672, based on IQR multiplier of 3.

Constituent: Chloride total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

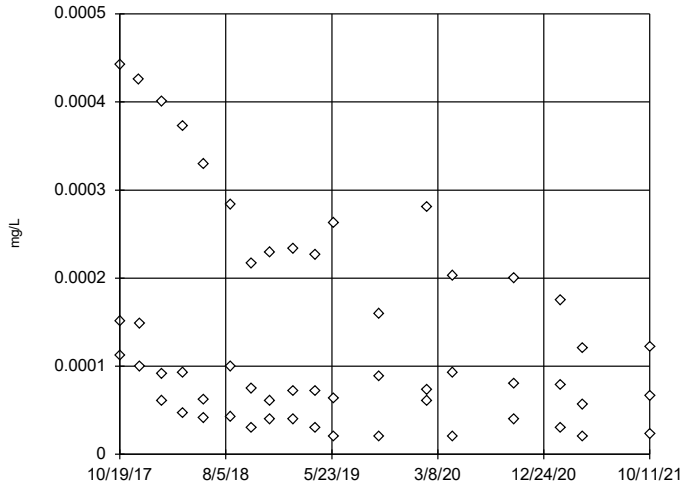


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.007827, low cutoff = 0.00001317, based on IQR multiplier of 3.

Constituent: Chromium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

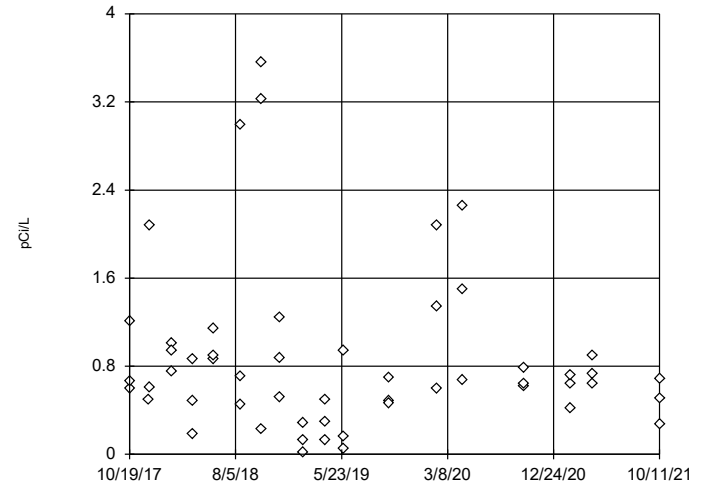


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.01879,  
 low cutoff = 4.8e-7, based on IQR multiplier of 3.

Constituent: Cobalt total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

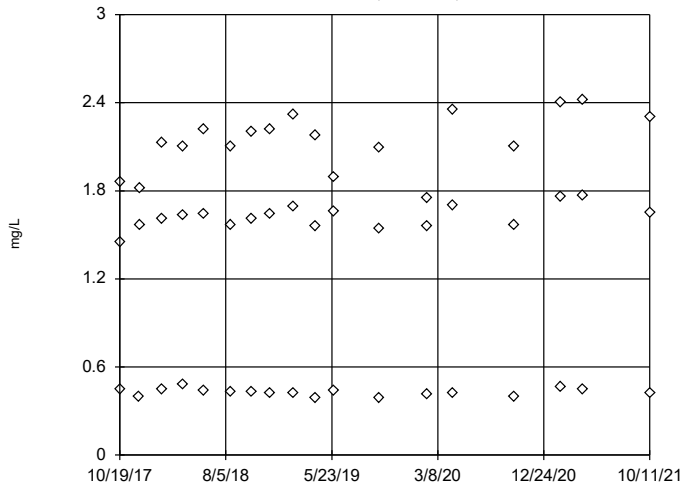


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 3.96, low cutoff = 0.0054, based on IQR multiplier of 3.

Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale -  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

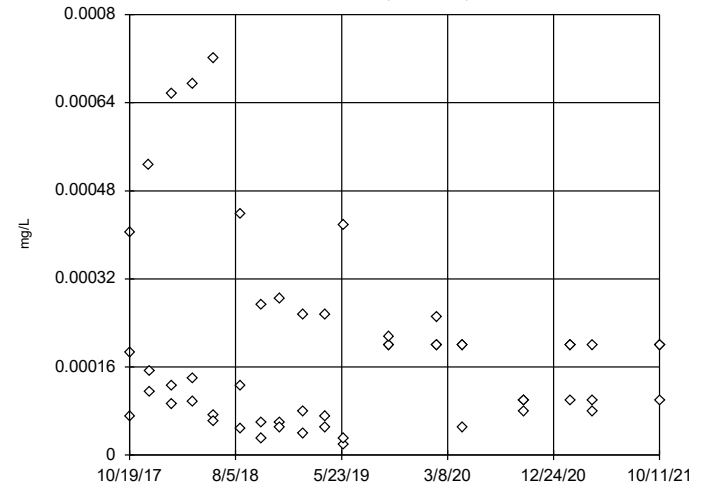


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 4.119, low cutoff = -3.518, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

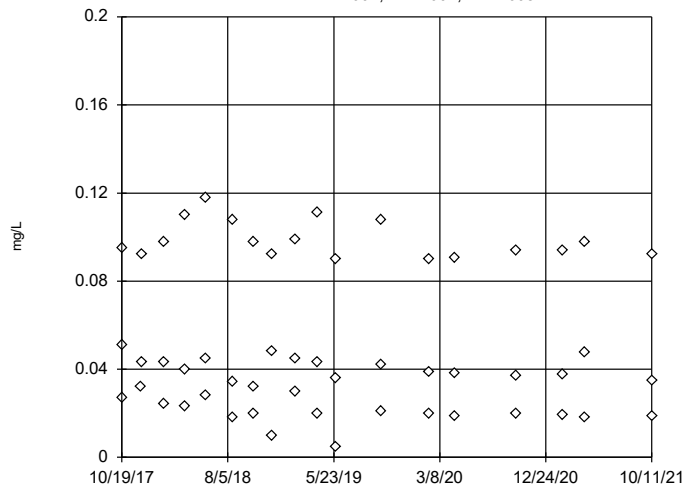


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.00512, low cutoff = 0.00002869, based on IQR multiplier of 3.

Constituent: Lead total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

### Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

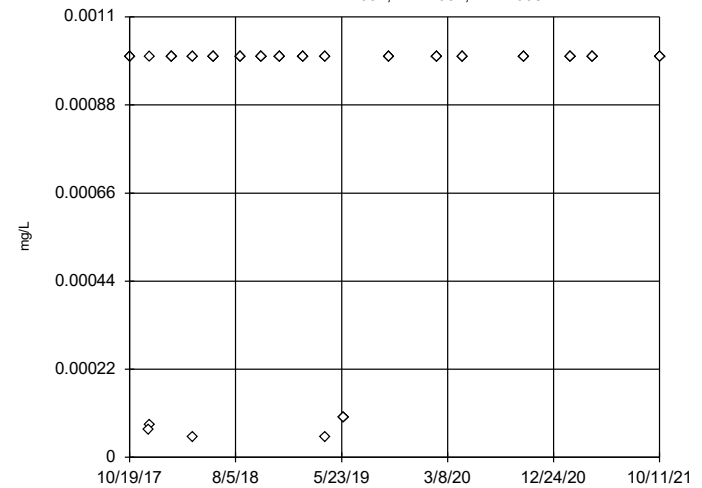


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.8488, low cutoff = -0.009114, based on IQR multiplier of 3.

Constituent: Lithium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

### Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

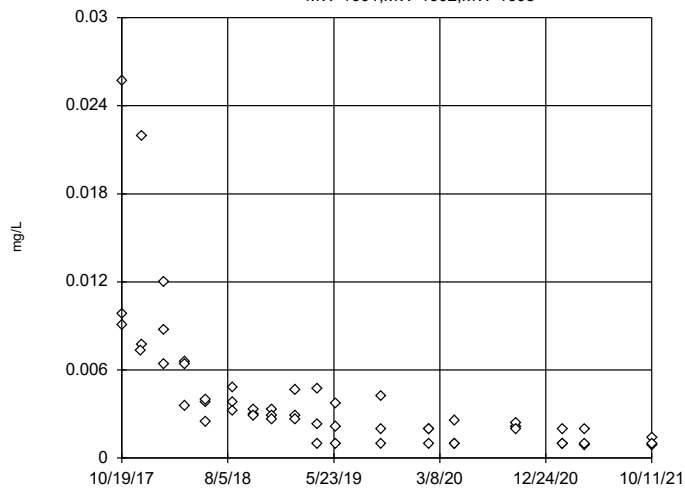


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

### Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

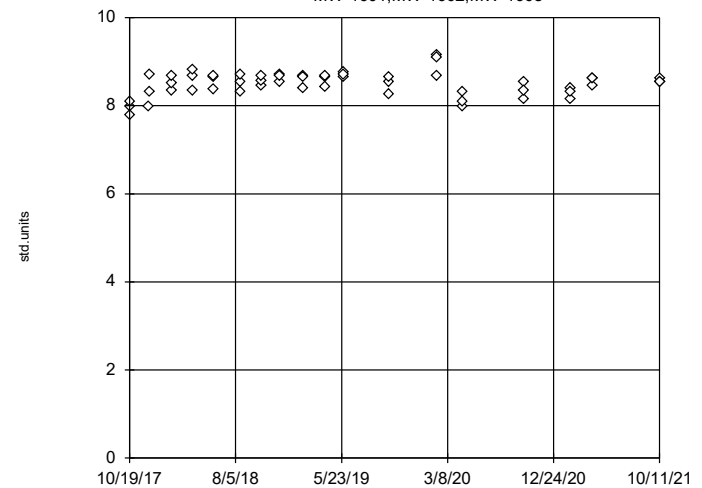


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.105, low cutoff = 0.00007505, based on IQR multiplier of 3.

Constituent: Molybdenum total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

### Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

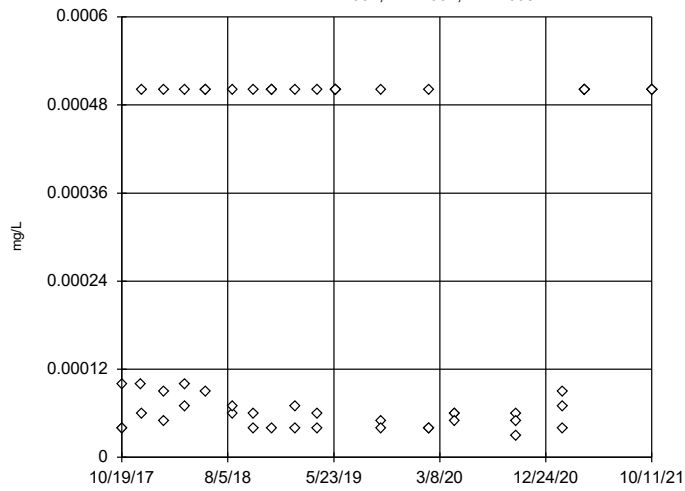


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x^4 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 9.534, low cutoff = 6.872, based on IQR multiplier of 3.

Constituent: pH [field] Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608

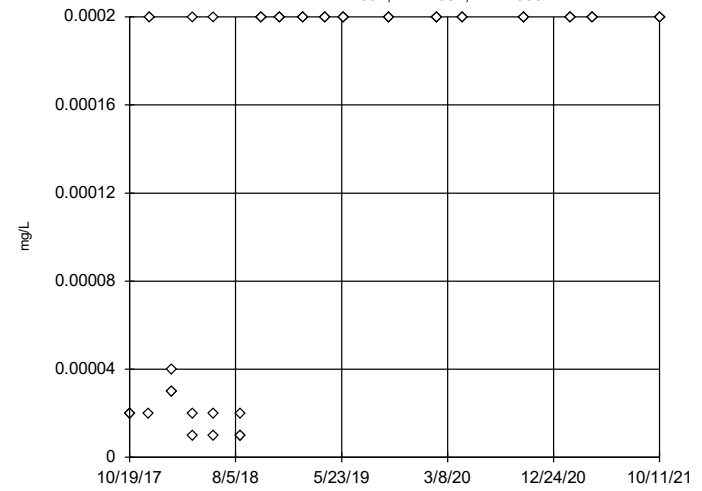


n = 54  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.5, low cutoff = 5.0e-8, based on IQR multiplier of 3.

Constituent: Selenium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening, Pooled Background

MW-1601,MW-1602,MW-1608



n = 54  
 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 = 0.03849, low cutoff = 1.8e-7, based on IQR multiplier of 3.

Constituent: Thallium total Analysis Run 1/26/2022 1:58 PM View: Chattanooga Shale - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

# Dumps Fault - Outlier Summary

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:37 PM

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	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 - Upgradient Wells (Dumps Fault) - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:14 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>
<b>Molybdenum total (mg/L)</b>	<b>MW-1611 (bg)</b>	<b>Yes</b>	<b>0.038,0.00676</b>	<b>NP</b>	<b>NaN</b>	<b>18</b>	<b>0.004465</b>	<b>0.008457</b>	<b>In(x)</b>	<b>ShapiroWilk</b>

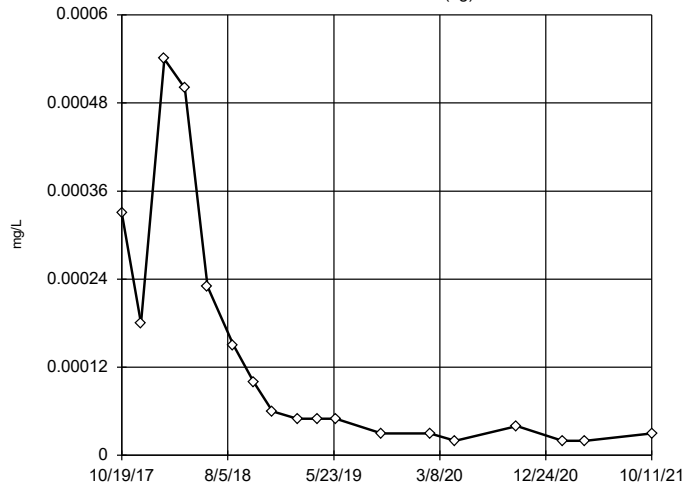


# Tukey's Outlier Test - Upgradient Wells (Dumps Fault)- All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:14 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	18	0.000135	0.0001639	ln(x)	ShapiroWilk
Arsenic total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.01462	0.01031	ln(x)	ShapiroWilk
Barium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.09569	0.04287	ln(x)	ShapiroWilk
Beryllium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.00003856	0.000019	ln(x)	ShapiroWilk
Cadmium total (mg/L)	MW-1611 (bg)	n/a	n/a	NP	NaN	18	0.00001944	0.00002357	unknown	ShapiroWilk
Chromium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.000422	0.0002203	x^(1/3)	ShapiroWilk
Cobalt total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.00007044	0.00006907	ln(x)	ShapiroWilk
Combined Radium 226 and 228 (pCi/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.606	0.4496	normal	ShapiroWilk
Fluoride total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.9283	0.1742	x^3	ShapiroWilk
Lead total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.0001863	0.0002219	ln(x)	ShapiroWilk
Lithium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.08689	0.02941	ln(x)	ShapiroWilk
Mercury total (mg/L)	MW-1611 (bg)	n/a	n/a	NP	NaN	18	0.0009489	0.0002168	unknown	ShapiroWilk
<b>Molybdenum total (mg/L)</b>	<b>MW-1611 (bg)</b>	<b>Yes</b>	<b>0.038,0.00676</b>	<b>NP</b>	<b>NaN</b>	<b>18</b>	<b>0.004465</b>	<b>0.008457</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Selenium total (mg/L)	MW-1611 (bg)	No	n/a	NP	NaN	18	0.00008556	0.00006446	ln(x)	ShapiroWilk
Thallium total (mg/L)	MW-1611 (bg)	n/a	n/a	NP	NaN	18	0.0001772	0.00005421	unknown	ShapiroWilk

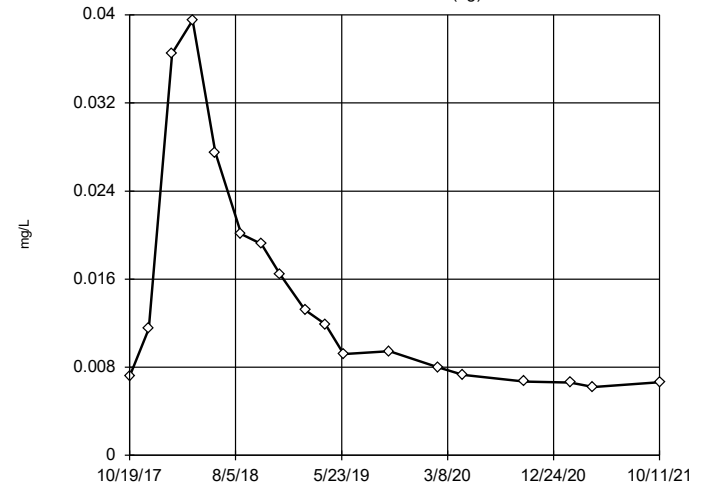
Tukey's Outlier Screening  
MW-1611 (bg)



n = 18  
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 = 0.06348, low cutoff = 9.6e-8, based on IQR multiplier of 3.

Constituent: Antimony total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

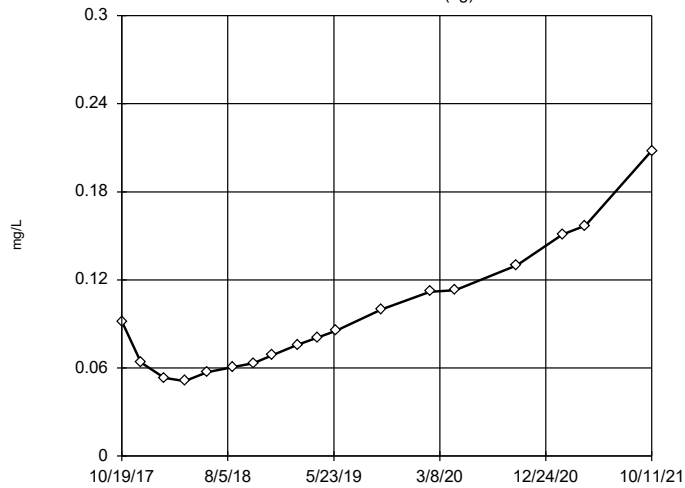
Tukey's Outlier Screening  
MW-1611 (bg)



n = 18  
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 = 0.4492, low cutoff = 0.0003026, based on IQR multiplier of 3.

Constituent: Arsenic total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

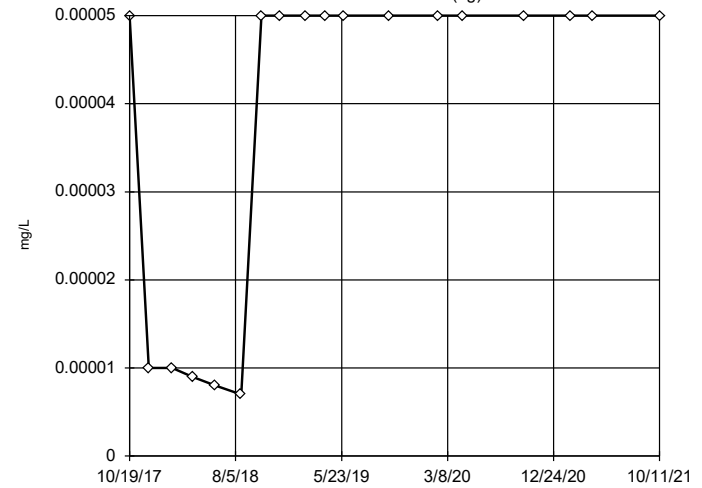
Tukey's Outlier Screening  
MW-1611 (bg)



n = 18  
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 = 0.9083, low cutoff = 0.008265, based on IQR multiplier of 3.

Constituent: Barium total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening  
MW-1611 (bg)

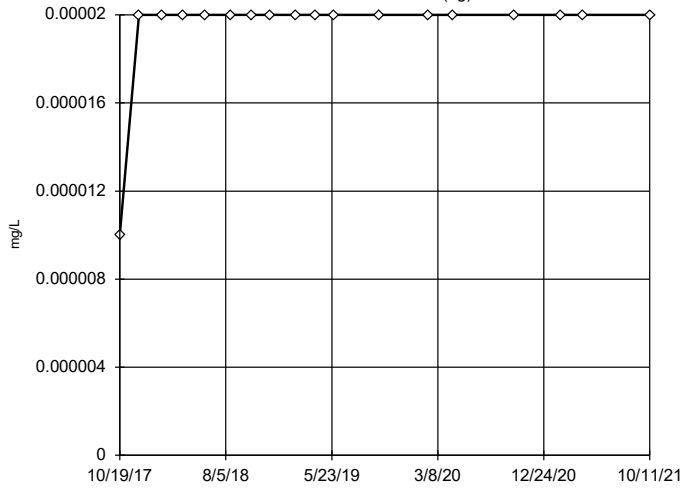


n = 18  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.00625, low cutoff = 8.0e-8, based on IQR multiplier of 3.

Constituent: Beryllium total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

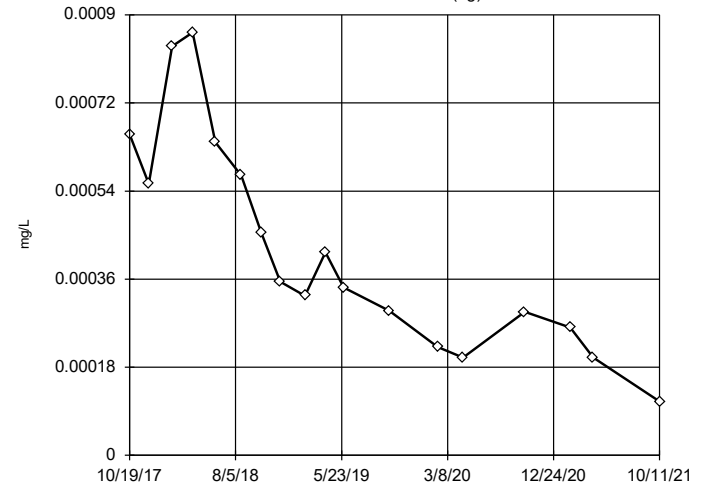


n = 18  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

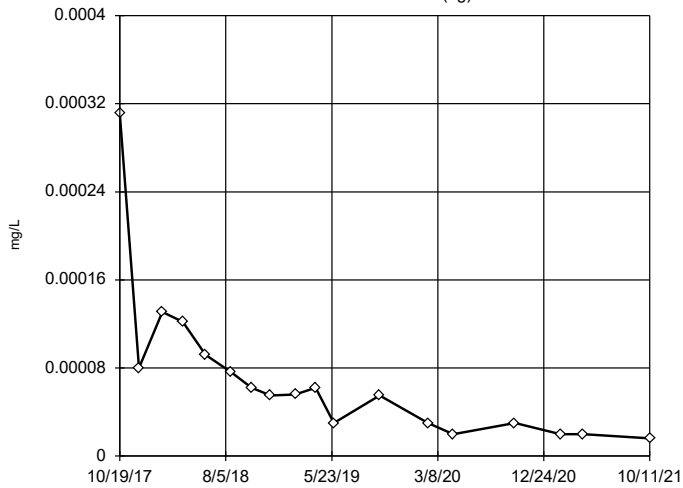


n = 18  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0035, low cutoff = -1.3e-7, based on IQR multiplier of 3.

Constituent: Chromium total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

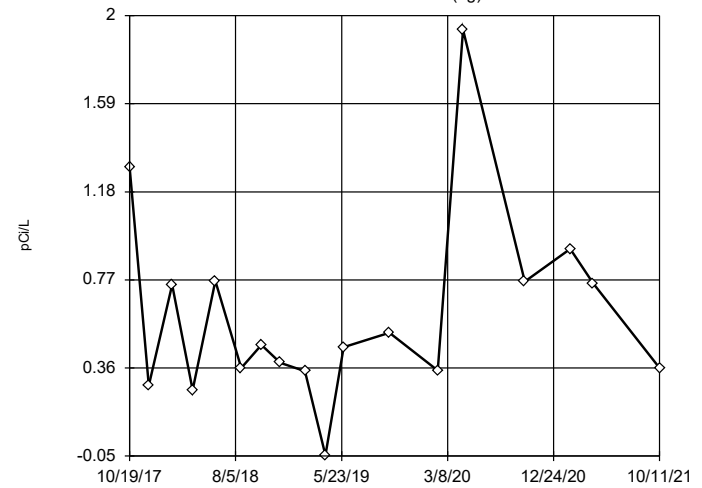


n = 18  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.003686, low cutoff = 5.7e-7, based on IQR multiplier of 3.

Constituent: Cobalt total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening

MW-1611 (bg)

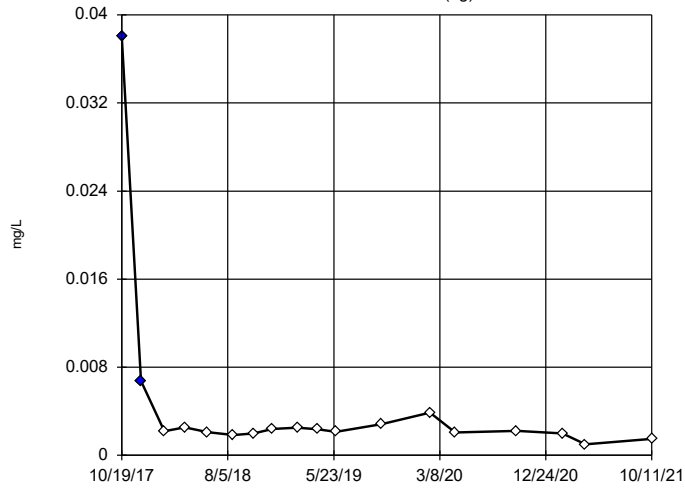


n = 18  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 2.019, low cutoff = -0.9085, based on IQR multiplier of 3.

Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
 Clinch River LF Client: AEP Data: Clinch River



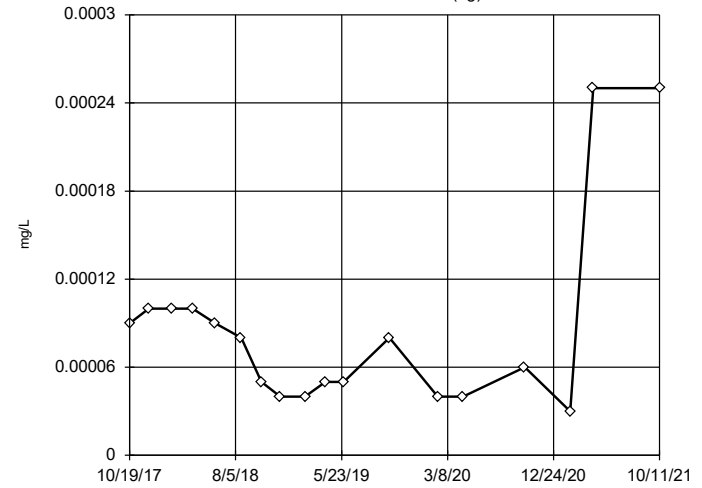
Tukey's Outlier Screening  
MW-1611 (bg)



n = 18  
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 = 0.006505, low cutoff = 0.0008258, based on IQR multiplier of 3.

Constituent: Molybdenum total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

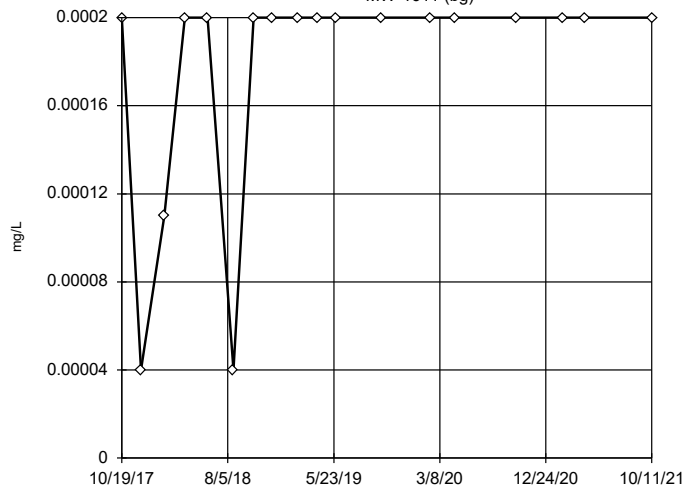
Tukey's Outlier Screening  
MW-1611 (bg)



n = 18  
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 = 0.001563, low cutoff = 0.0000256, based on IQR multiplier of 3.

Constituent: Selenium total Analysis Run 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening  
MW-1611 (bg)



n = 18  
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 1/26/2022 2:13 PM View: Dumps Fault - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

# Rome Limestone - Outlier Summary

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:50 PM

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MW-1607 Total Dissolved Solids (mg/L)

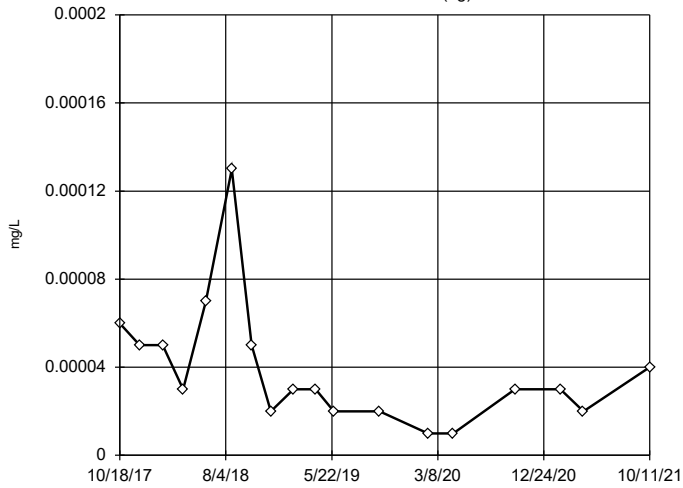
10/18/2017	468 (o)
12/12/2017	417 (o)

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

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:44 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	18	0.00003889	0.00002826	ln(x)	ShapiroWilk
Arsenic total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.0002444	0.0002743	ln(x)	ShapiroWilk
Barium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.3964	0.05273	ln(x)	ShapiroWilk
Beryllium total (mg/L)	MW-1609 (bg)	n/a	n/a	NP	NaN	18	0.00004744	0.00001084	unknown	ShapiroWilk
Cadmium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.00001472	0.000008484	ln(x)	ShapiroWilk
Chloride total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	1.733	0.8485	ln(x)	ShapiroWilk
Chromium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.0001676	0.00006878	x^(1/3)	ShapiroWilk
Cobalt total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.0002895	0.00033	x^(1/3)	ShapiroWilk
Combined Radium 226 and 228 (pCi/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	2.066	1.167	ln(x)	ShapiroWilk
Fluoride total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.2572	0.03691	ln(x)	ShapiroWilk
Lead total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.0004458	0.0002794	sqrt(x)	ShapiroWilk
Lithium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.004993	0.00409	ln(x)	ShapiroWilk
Mercury total (mg/L)	MW-1609 (bg)	n/a	n/a	NP	NaN	18	0.00095	0.0002121	unknown	ShapiroWilk
Molybdenum total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.001219	0.0007198	x^(1/3)	ShapiroWilk
Selenium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.0002306	0.00021	ln(x)	ShapiroWilk
Sulfate total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	15.5	3.031	ln(x)	ShapiroWilk
Thallium total (mg/L)	MW-1609 (bg)	No	n/a	NP	NaN	18	0.0001539	0.00007815	x^(1/3)	ShapiroWilk

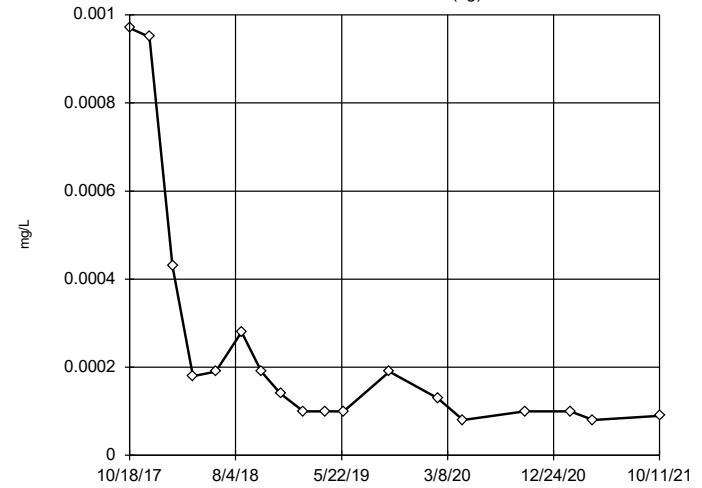
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.0007813, low cutoff = 0.0000128, based on IQR multiplier of 3.

Constituent: Antimony total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

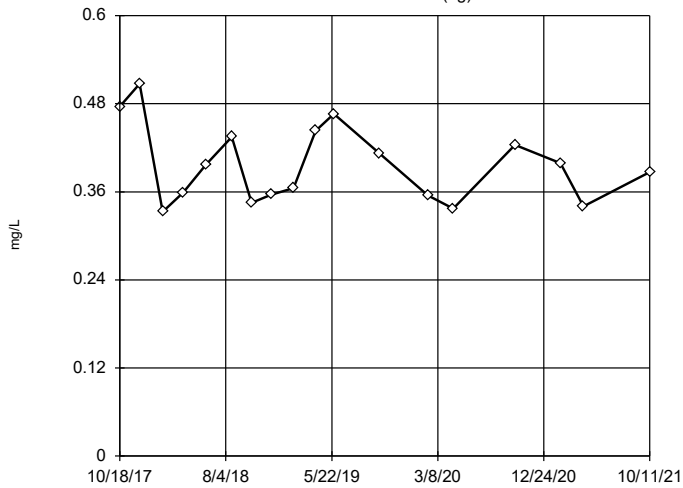
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.00283, low cutoff = 0.0000815, based on IQR multiplier of 3.

Constituent: Arsenic total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

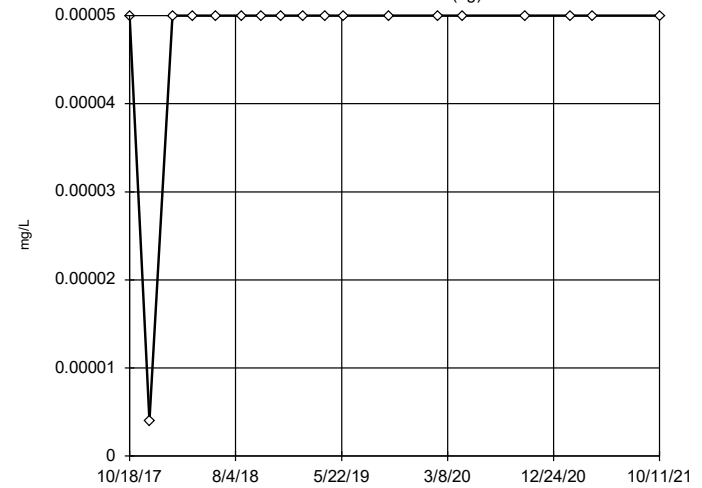
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.8664, low cutoff = 0.1773, based on IQR multiplier of 3.

Constituent: Barium total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

Tukey's Outlier Screening  
MW-1609 (bg)

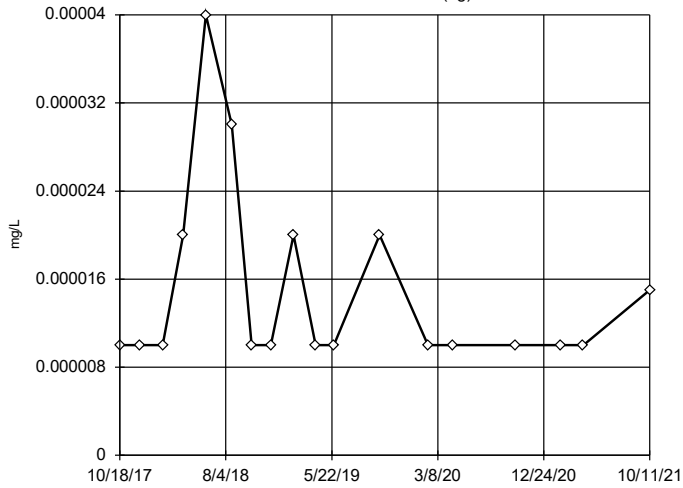


n = 18  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River



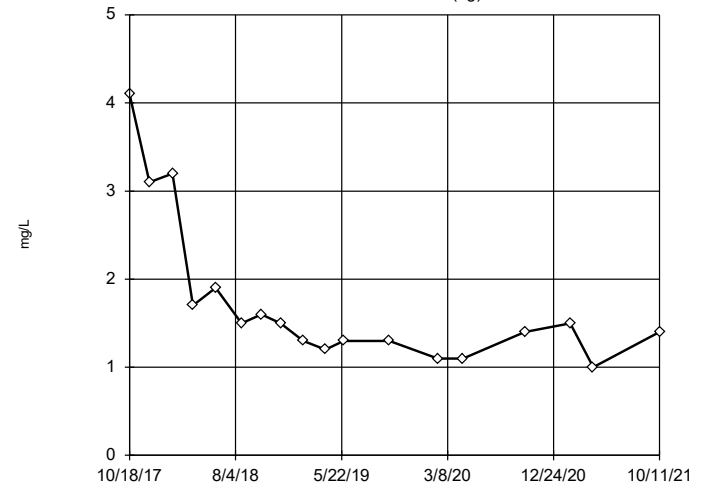
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.00016, low cutoff = 0.0000125, based on IQR multiplier of 3.

Constituent: Cadmium total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

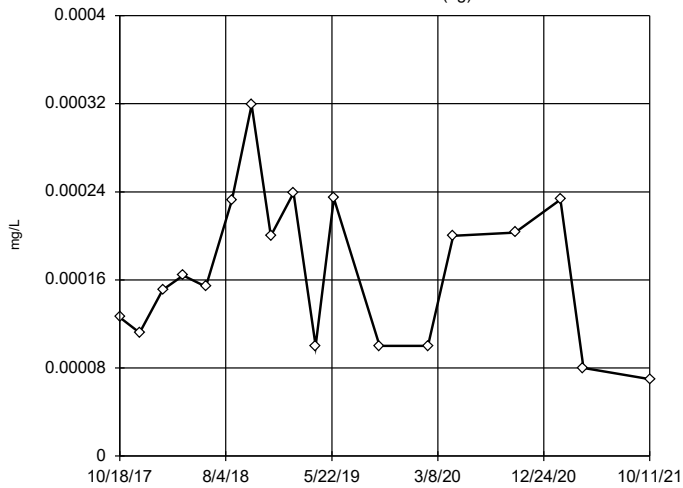
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 5.354, low cutoff = 0.4192, based on IQR multiplier of 3.

Constituent: Chloride total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

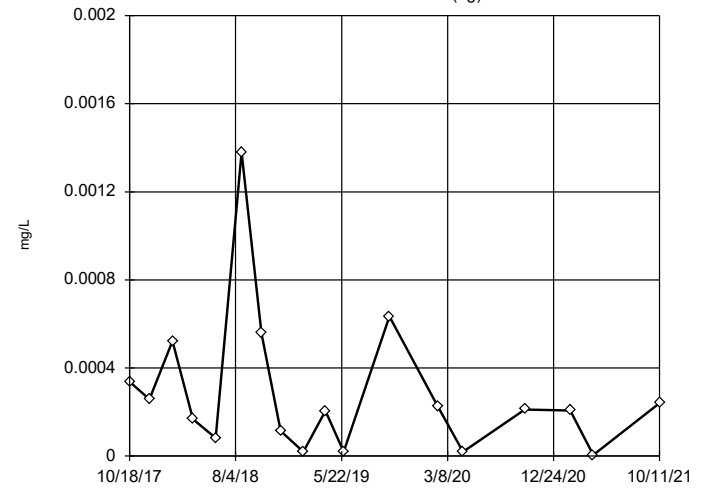
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.001215, low cutoff = 1.7e-9, based on IQR multiplier of 3.

Constituent: Chromium total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

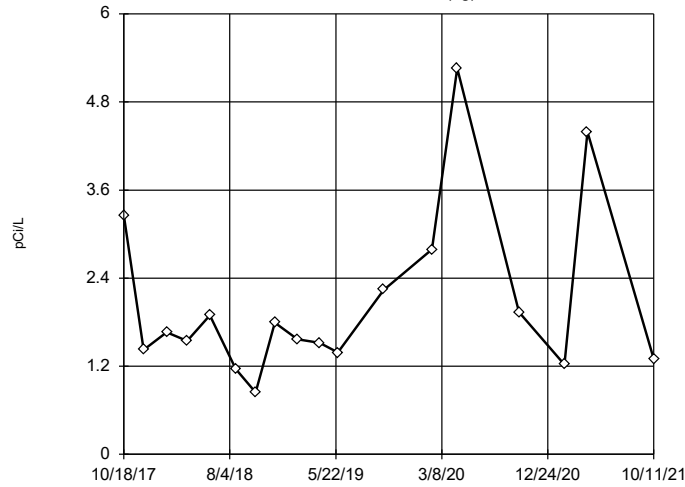
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.007354, low cutoff = -0.0005945, based on IQR multiplier of 3.

Constituent: Cobalt total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

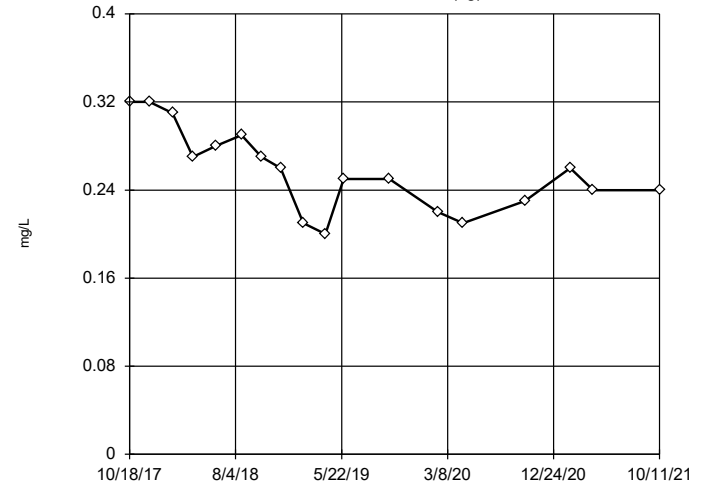
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 16.13, low cutoff = 0.2081, based on IQR multiplier of 3.

Constituent: Combined Radium 226 and 228 Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - P  
Clinch River LF Client: AEP Data: Clinch River

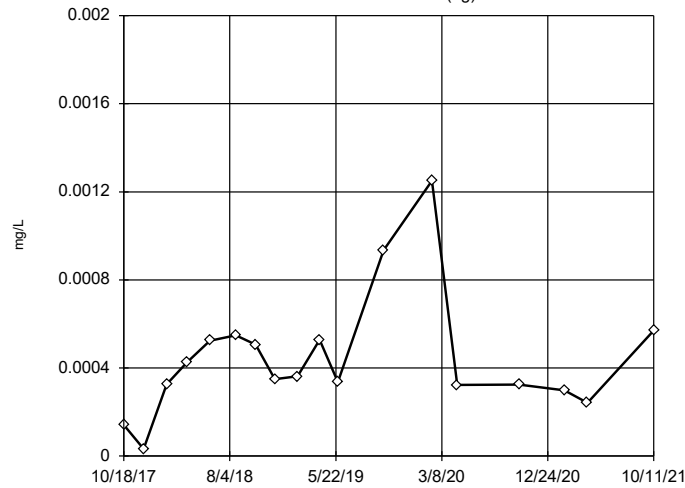
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.5793, low cutoff = 0.1107, based on IQR multiplier of 3.

Constituent: Fluoride total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

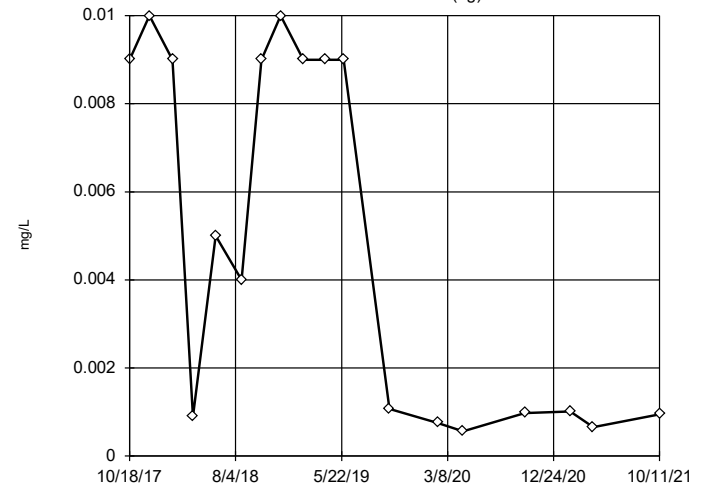
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.001594, low cutoff = 7.9e-7, based on IQR multiplier of 3.

Constituent: Lead total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

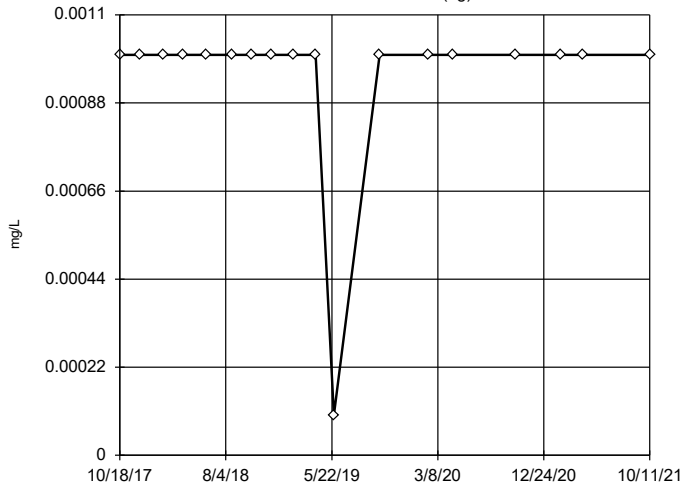
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 8.299, low cutoff = 0.00001003, based on IQR multiplier of 3.

Constituent: Lithium total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

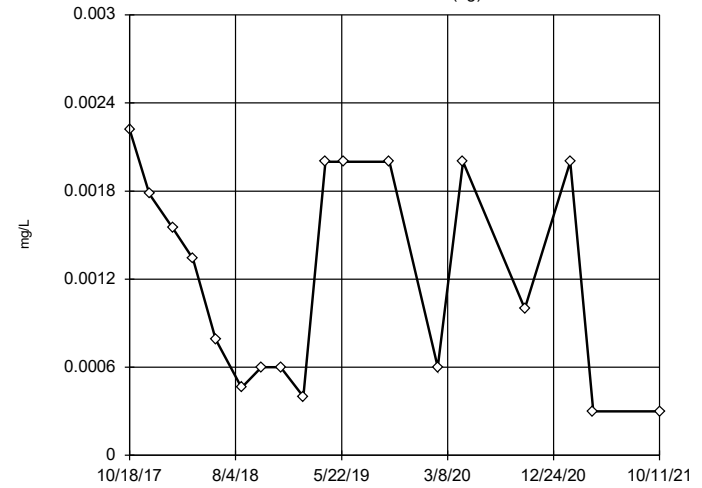
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
No outliers found. Tukey's method selected by user.  
Data were cube 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: Mercury total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

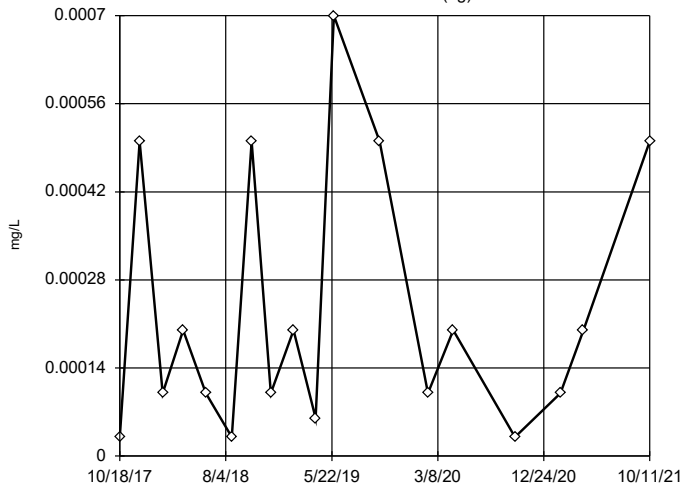
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.01792, low cutoff = -0.0001655, based on IQR multiplier of 3.

Constituent: Molybdenum total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

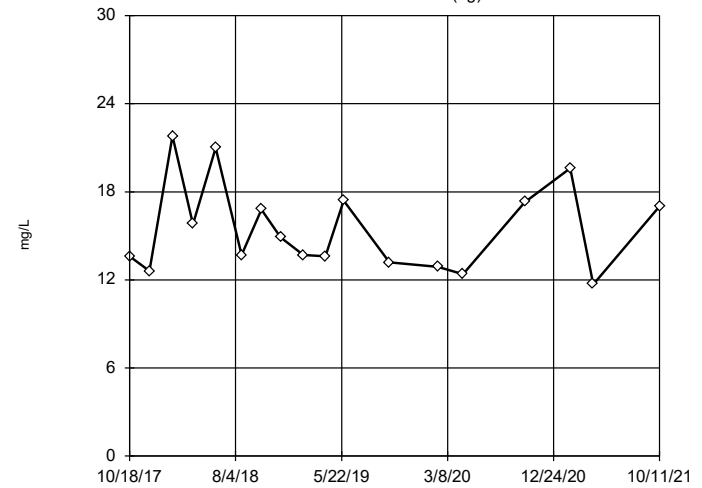
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 = 0.1345, low cutoff = 2.9e-7, based on IQR multiplier of 3.

Constituent: Selenium total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

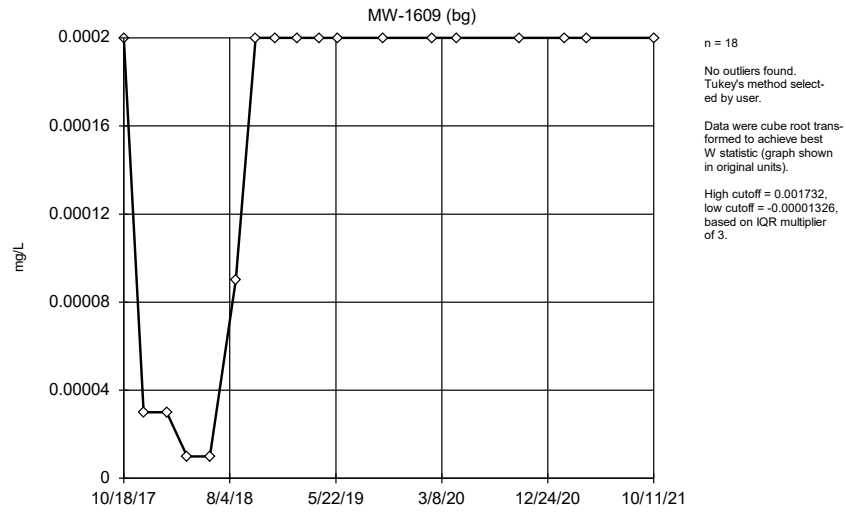
Tukey's Outlier Screening  
MW-1609 (bg)



n = 18  
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 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

### Tukey's Outlier Screening



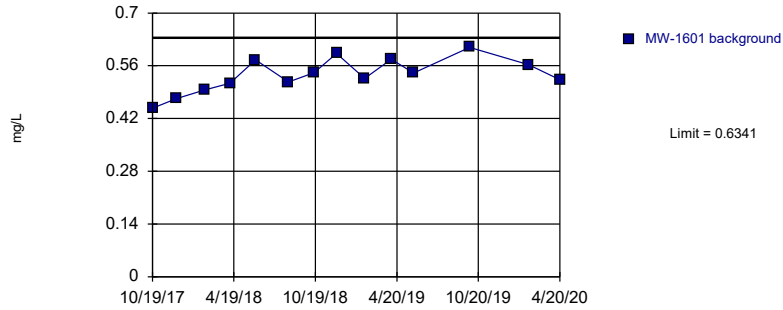
Constituent: Thallium total Analysis Run 1/26/2022 2:43 PM View: Rome Limestone - Pond 1 Outliers  
Clinch River LF Client: AEP Data: Clinch River

# Intrawell Prediction Limits - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:12 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bq N	Bq Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron total (mg/L)	MW-1601	0.6341	n/a	n/a	1 future	n/a	14	0.5355	0.04578	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1602	0.6927	n/a	n/a	1 future	n/a	14	0.6174	0.03494	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1603	0.4889	n/a	n/a	1 future	n/a	14	0.2755	0.09908	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1604	0.5007	n/a	n/a	1 future	n/a	14	0.4128	0.04079	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1605	0.6725	n/a	n/a	1 future	n/a	14	0.5746	0.04545	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1608	0.3938	n/a	n/a	1 future	n/a	14	0.348	0.02128	0	None	No	0.00188	Param Intra 1 of 2
Boron total (mg/L)	MW-1612	0.5898	n/a	n/a	1 future	n/a	13	0.4493	0.06407	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1601	2.492	n/a	n/a	1 future	n/a	14	2.088	0.1876	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1602	1.745	n/a	n/a	1 future	n/a	14	1.602	0.06624	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1603	0.1846	n/a	n/a	1 future	n/a	14	0.125	0.02767	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1604	0.2875	n/a	n/a	1 future	n/a	14	0.2364	0.02373	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1605	0.4282	n/a	n/a	1 future	n/a	14	0.3593	0.03198	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1608	0.4803	n/a	n/a	1 future	n/a	14	0.4264	0.02499	0	None	No	0.00188	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1612	0.255	n/a	n/a	1 future	n/a	13	0.1662	0.04053	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1601	356.1	n/a	n/a	1 future	n/a	14	226.6	60.13	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1602	41.21	n/a	n/a	1 future	n/a	14	26.24	6.947	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1603	31.45	n/a	n/a	1 future	n/a	9	11.28	8.097	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1604	4.872	n/a	n/a	1 future	n/a	9	2.2	1.072	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1605	132.9	n/a	n/a	1 future	n/a	9	51.86	32.51	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1608	184.9	n/a	n/a	1 future	n/a	14	171.9	6.037	0	None	No	0.00188	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1612	18.12	n/a	n/a	1 future	n/a	9	5.644	5.005	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1601	1709	n/a	n/a	1 future	n/a	14	1421	133.4	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1602	573.2	n/a	n/a	1 future	n/a	14	525.6	22.1	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1603	682.2	n/a	n/a	1 future	n/a	14	473.6	96.83	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1604	416.8	n/a	n/a	1 future	n/a	14	391.9	11.6	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1605	901.8	n/a	n/a	1 future	n/a	13	788.1	51.85	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1608	489.4	n/a	n/a	1 future	n/a	14	447.4	19.5	0	None	No	0.00188	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1612	576.7	n/a	n/a	1 future	n/a	13	3.9e13	1.1e13	0	None	x^5	0.00188	Param Intra 1 of 2

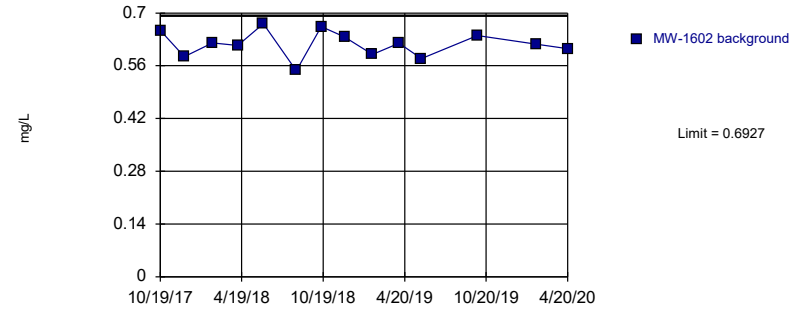
Prediction Limit  
Intrawell Parametric, MW-1601 (bg)



Background Data Summary: Mean=0.5355, Std. Dev.=0.04578, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9801, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

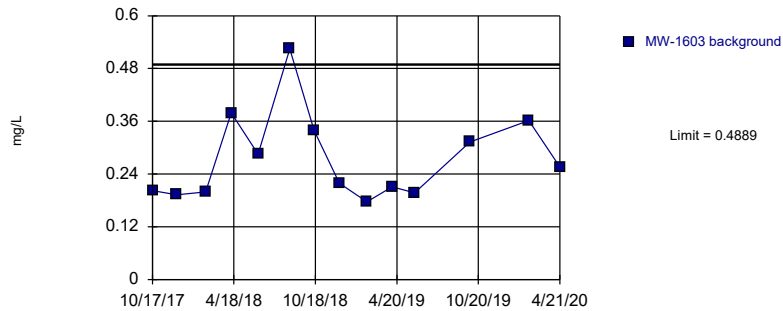
Prediction Limit  
Intrawell Parametric, MW-1602 (bg)



Background Data Summary: Mean=0.6174, Std. Dev.=0.03494, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9786, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

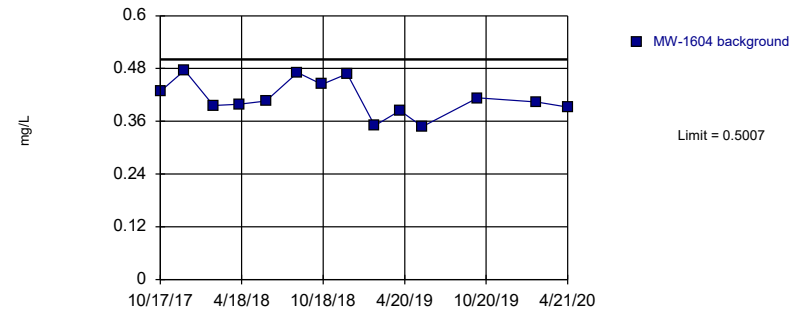
Prediction Limit  
Intrawell Parametric, MW-1603



Background Data Summary: Mean=0.2755, Std. Dev.=0.09908, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8548, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

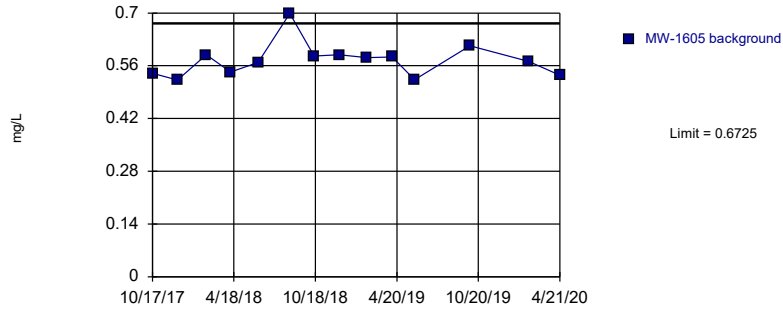
Prediction Limit  
Intrawell Parametric, MW-1604



Background Data Summary: Mean=0.4128, Std. Dev.=0.04079, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9377, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

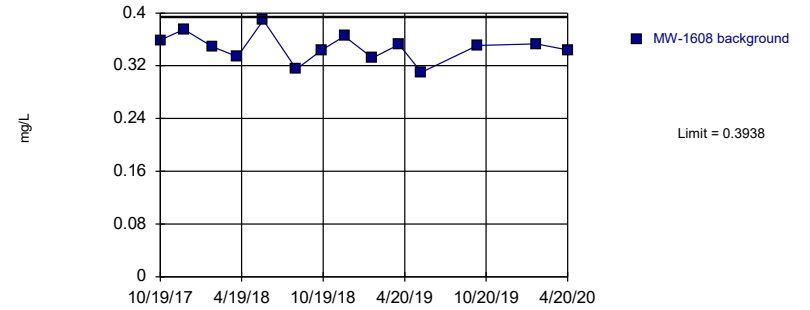
Prediction Limit  
Intrawell Parametric, MW-1605



Background Data Summary: Mean=0.5746, Std. Dev.=0.04545, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.855, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

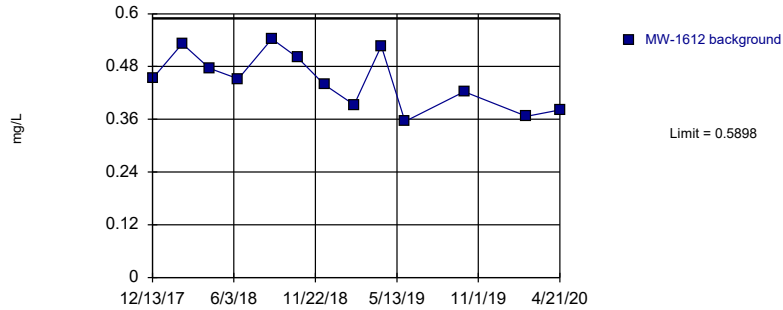
Prediction Limit  
Intrawell Parametric, MW-1608 (bg)



Background Data Summary: Mean=0.348, Std. Dev.=0.02128, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9748, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

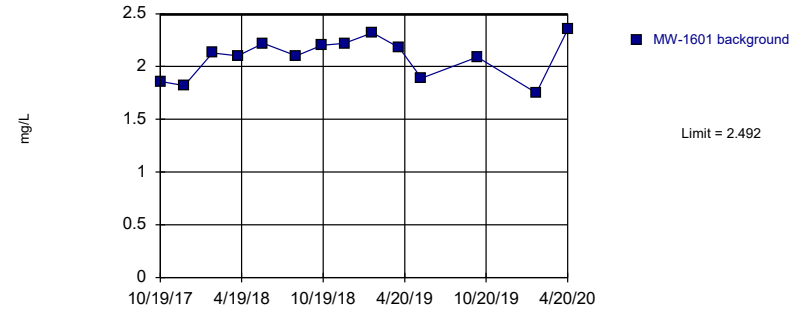
Prediction Limit  
Intrawell Parametric, MW-1612



Background Data Summary: Mean=0.4493, Std. Dev.=0.06407, n=13. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9443, critical = 0.814. Kappa = 2.193 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

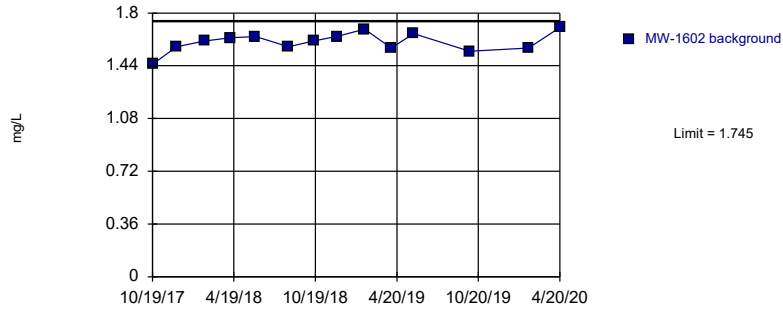
Prediction Limit  
Intrawell Parametric, MW-1601 (bg)



Background Data Summary: Mean=2.088, Std. Dev.=0.1876, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9208, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

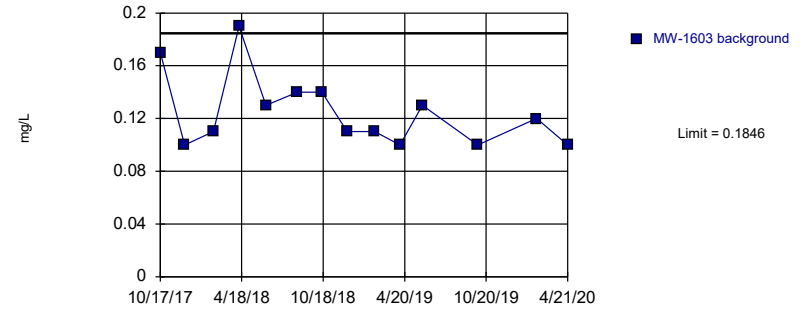
Prediction Limit  
Intrawell Parametric, MW-1602 (bg)



Background Data Summary: Mean=1.602, Std. Dev.=0.06624, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9527, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

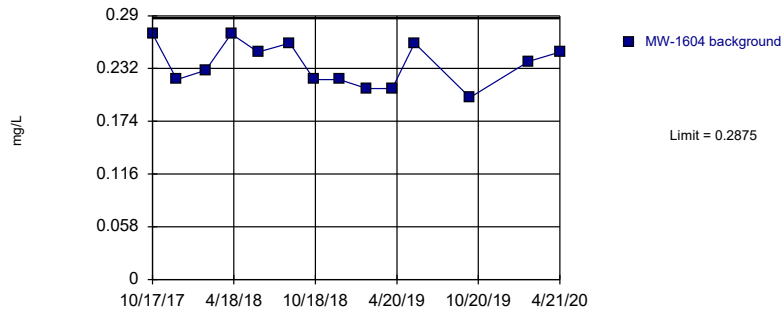
Prediction Limit  
Intrawell Parametric, MW-1603



Background Data Summary: Mean=0.125, Std. Dev.=0.02767, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8452, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

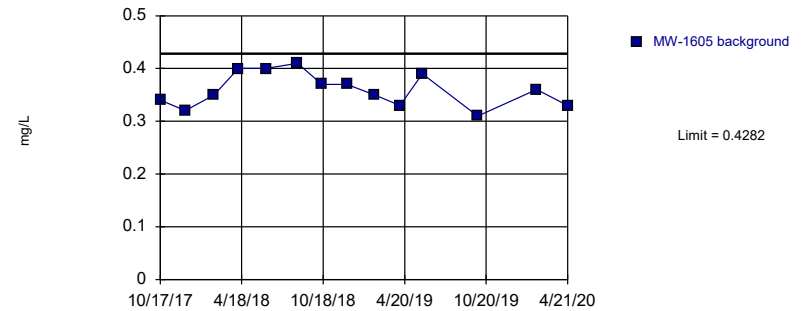
Prediction Limit  
Intrawell Parametric, MW-1604



Background Data Summary: Mean=0.2364, Std. Dev.=0.02373, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9254, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

Prediction Limit  
Intrawell Parametric, MW-1605

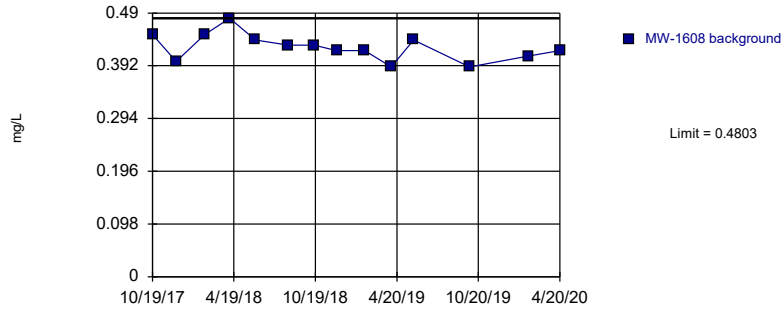


Background Data Summary: Mean=0.3593, Std. Dev.=0.03198, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9521, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River



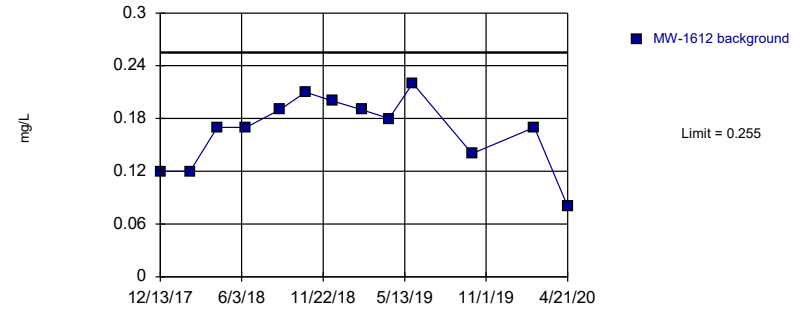
Prediction Limit  
Intrawell Parametric, MW-1608 (bg)



Background Data Summary: Mean=0.4264, Std. Dev.=0.02499, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9605, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

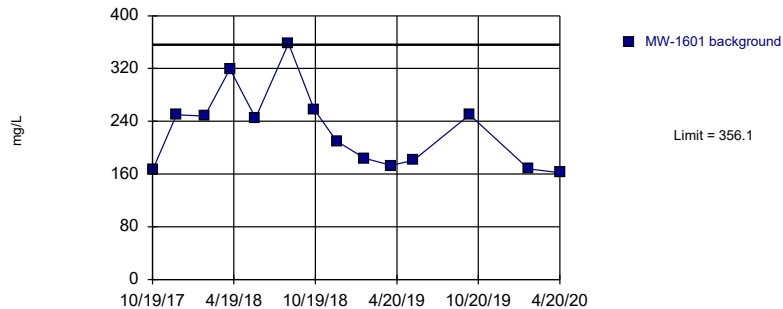
Prediction Limit  
Intrawell Parametric, MW-1612



Background Data Summary: Mean=0.1662, Std. Dev.=0.04053, n=13. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9319, critical = 0.814. Kappa = 2.193 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

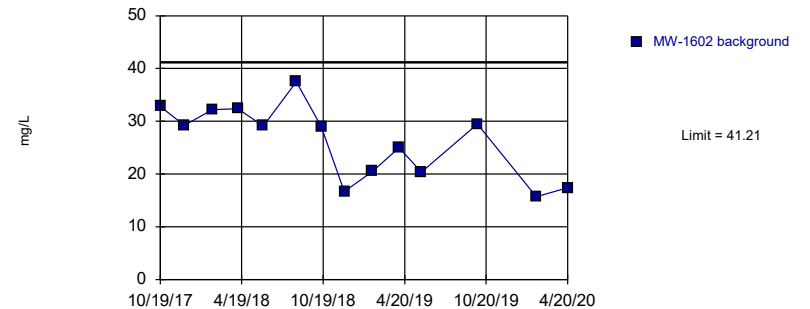
Prediction Limit  
Intrawell Parametric, MW-1601 (bg)



Background Data Summary: Mean=226.6, Std. Dev.=60.13, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8832, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

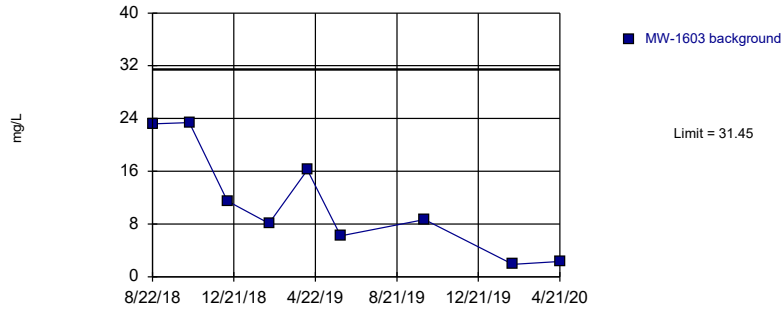
Prediction Limit  
Intrawell Parametric, MW-1602 (bg)



Background Data Summary: Mean=26.24, Std. Dev.=6.947, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9204, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

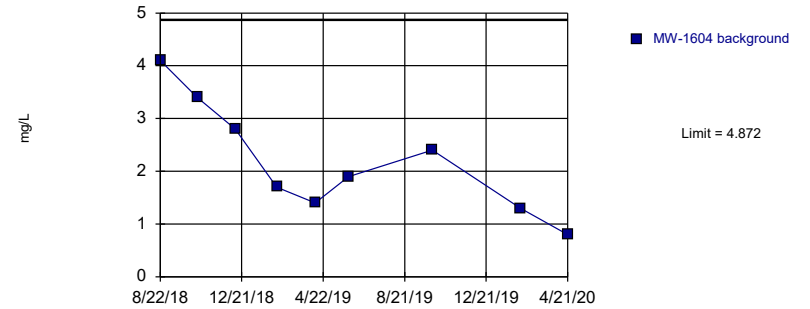
Prediction Limit  
Intrawell Parametric, MW-1603



Background Data Summary: Mean=11.28, Std. Dev.=8.097, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.901, critical = 0.764. Kappa = 2.492 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

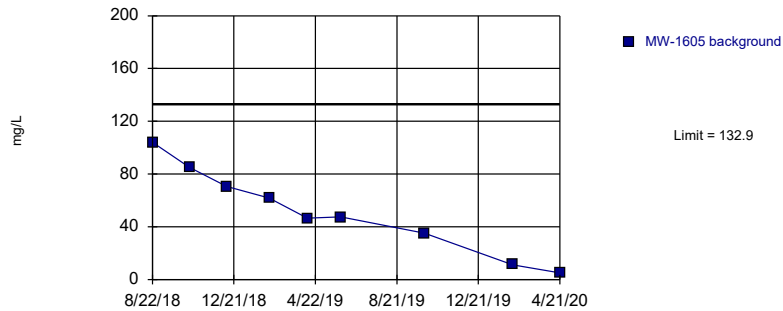
Prediction Limit  
Intrawell Parametric, MW-1604



Background Data Summary: Mean=2.2, Std. Dev.=1.072, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.957, critical = 0.764. Kappa = 2.492 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

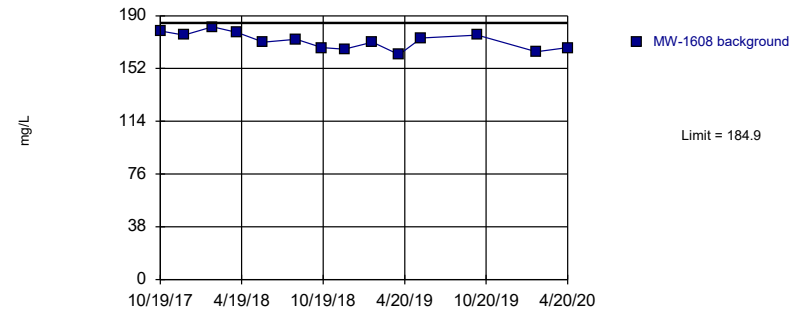
Prediction Limit  
Intrawell Parametric, MW-1605



Background Data Summary: Mean=51.86, Std. Dev.=32.51, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9738, critical = 0.764. Kappa = 2.492 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

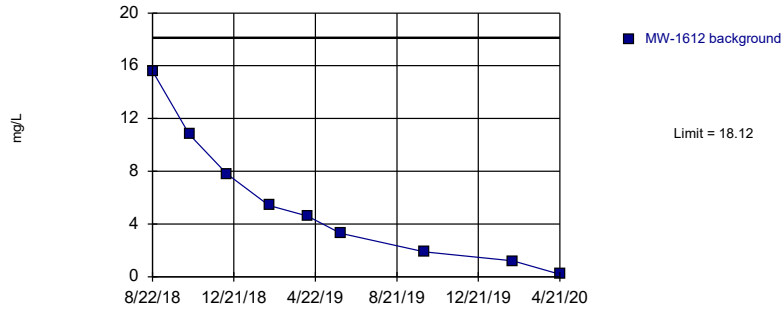
Prediction Limit  
Intrawell Parametric, MW-1608 (bg)



Background Data Summary: Mean=171.9, Std. Dev.=6.037, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9699, critical = 0.825. Kappa = 2.154 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

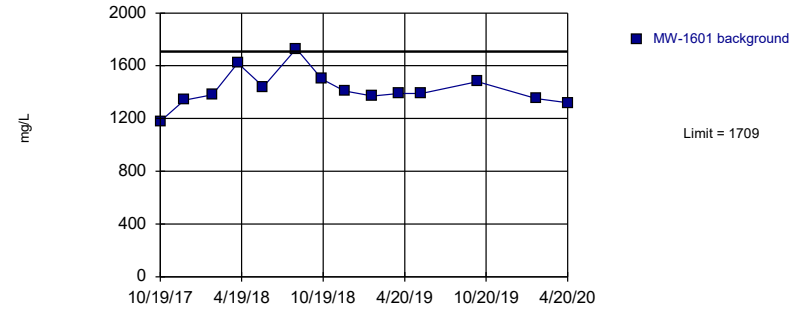
Prediction Limit  
Intrawell Parametric, MW-1612



Background Data Summary: Mean=5.644, Std. Dev.=5.005, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9157, critical = 0.764. Kappa = 2.492 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 Intrawell Clinch River LF Client: AEP Data: Clinch River

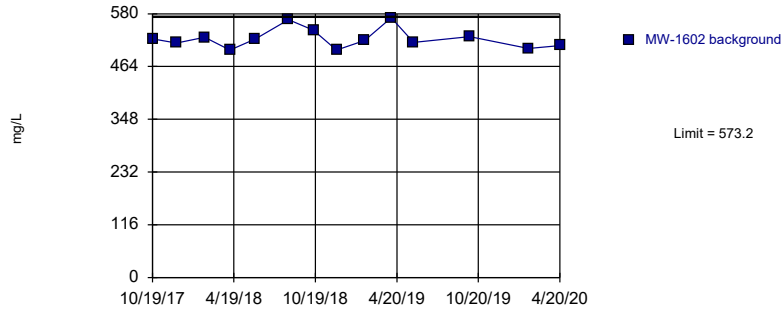
Prediction Limit  
Intrawell Parametric, MW-1601 (bg)



Background Data Summary: Mean=1421, Std. Dev.=133.4, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9225, critical = 0.825. Kappa = 2.154 (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 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 In Clinch River LF Client: AEP Data: Clinch River

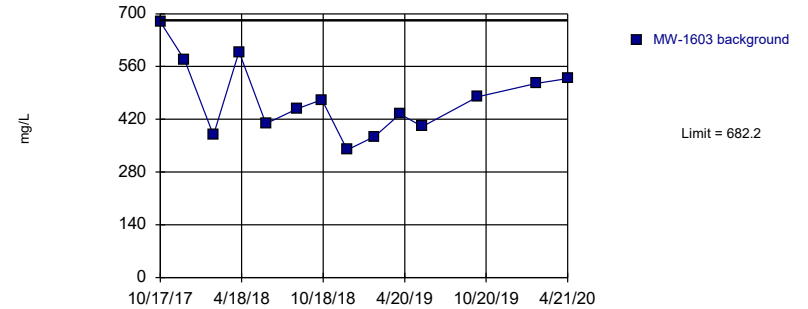
Prediction Limit  
Intrawell Parametric, MW-1602 (bg)



Background Data Summary: Mean=525.6, Std. Dev.=22.1, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8891, critical = 0.825. Kappa = 2.154 (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 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 In Clinch River LF Client: AEP Data: Clinch River

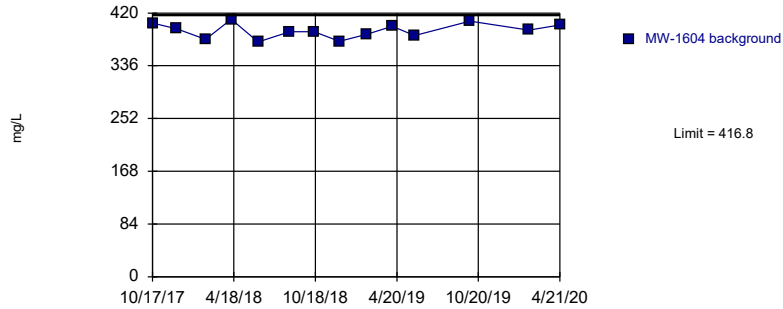
Prediction Limit  
Intrawell Parametric, MW-1603



Background Data Summary: Mean=473.6, Std. Dev.=96.83, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9579, critical = 0.825. Kappa = 2.154 (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 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 In Clinch River LF Client: AEP Data: Clinch River

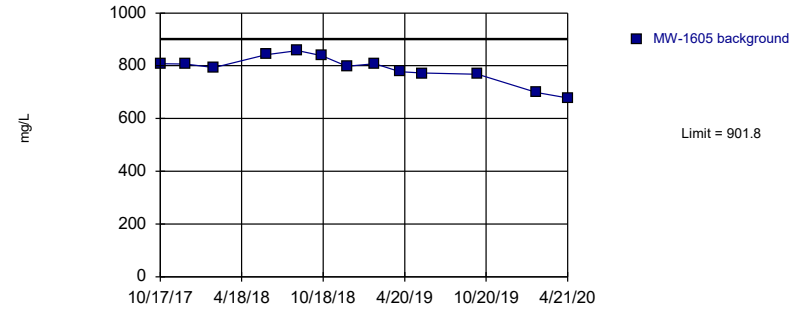
Prediction Limit  
Intrawell Parametric, MW-1604



Background Data Summary: Mean=391.9, Std. Dev.=11.6, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.962, critical = 0.825. Kappa = 2.154 (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 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 In Clinch River LF Client: AEP Data: Clinch River

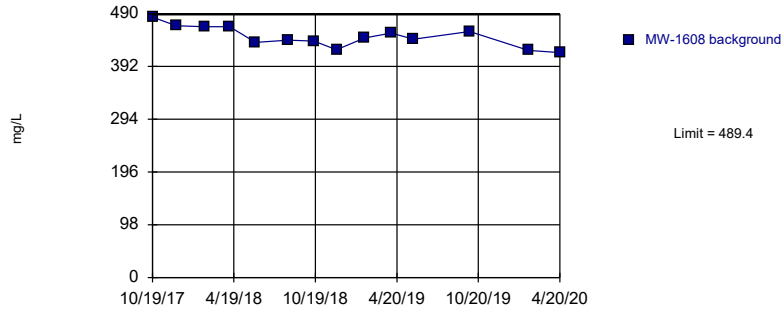
Prediction Limit  
Intrawell Parametric, MW-1605



Background Data Summary: Mean=788.1, Std. Dev.=51.85, n=13. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9028, critical = 0.814. Kappa = 2.193 (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 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 In Clinch River LF Client: AEP Data: Clinch River

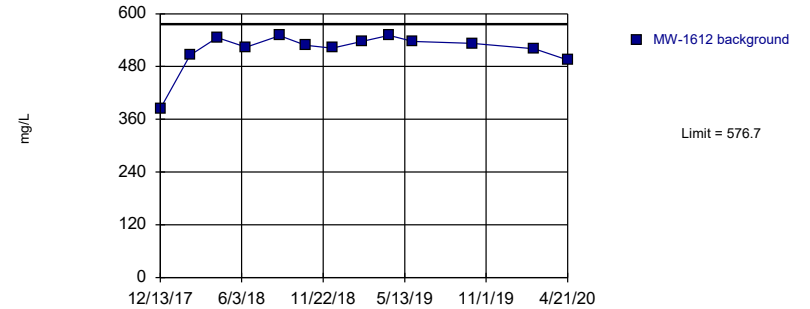
Prediction Limit  
Intrawell Parametric, MW-1608 (bg)



Background Data Summary: Mean=447.4, Std. Dev.=19.5, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9621, critical = 0.825. Kappa = 2.154 (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 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 In Clinch River LF Client: AEP Data: Clinch River

Prediction Limit  
Intrawell Parametric, MW-1612



Background Data Summary (based on x\*5 transformation): Mean=3.9e13, Std. Dev.=1.1e13, n=13. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8281, critical = 0.814. Kappa = 2.193 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.00188. Assumes 1 future value.

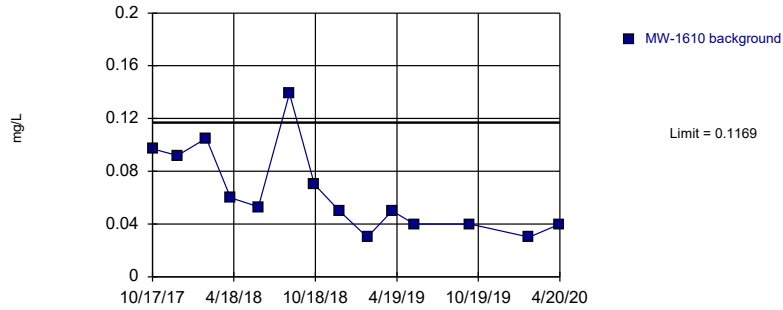
Constituent: Total Dissolved Solids Analysis Run 1/26/2022 2:09 PM View: Chattanooga Shale - Pond 1 In Clinch River LF Client: AEP Data: Clinch River

# Intrawell Prediction Limits - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 1:47 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bq N	Bq Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron total (mg/L)	MW-1610	0.1169	n/a	n/a	1 future	n/a	14	0.064	0.03256	0	None	No	0.007498	Param Intra 1 of 2
Boron total (mg/L)	MW-1611	0.7239	n/a	n/a	1 future	n/a	14	0.6044	0.07355	0	None	No	0.007498	Param Intra 1 of 2
Calcium total (mg/L)	MW-1610	38.7	n/a	n/a	1 future	n/a	14	36.2	1.537	0	None	No	0.007498	Param Intra 1 of 2
Calcium total (mg/L)	MW-1611	46.59	n/a	n/a	1 future	n/a	9	33.1	7.433	0	None	No	0.007498	Param Intra 1 of 2
Chloride total (mg/L)	MW-1610	12.54	n/a	n/a	1 future	n/a	14	3.341	0.1228	0	None	sqrt(x)	0.007498	Param Intra 1 of 2
Chloride total (mg/L)	MW-1611	48.33	n/a	n/a	1 future	n/a	9	29.18	10.55	0	None	No	0.007498	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1610	0.2254	n/a	n/a	1 future	n/a	14	0.1964	0.01781	0	None	No	0.007498	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1611	1.165	n/a	n/a	1 future	n/a	14	0.8893	0.1694	0	None	No	0.007498	Param Intra 1 of 2
pH [field] (std.units)	MW-1610	7.979	7.063	n/a	1 future	n/a	14	7.521	0.2817	0	None	No	0.003749	Param Intra 1 of 2
pH [field] (std.units)	MW-1611	8.131	7.272	n/a	1 future	n/a	14	59.5	4.07	0	None	x^2	0.003749	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1610	51.75	n/a	n/a	1 future	n/a	14	44.11	4.699	0	None	No	0.007498	Param Intra 1 of 2
Sulfate total (mg/L)	MW-1611	513.5	n/a	n/a	1 future	n/a	9	263.4	137.7	0	None	No	0.007498	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1610	267.2	n/a	n/a	1 future	n/a	14	252.6	8.976	0	None	No	0.007498	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1611	1418	n/a	n/a	1 future	n/a	9	957.8	253.5	0	None	No	0.007498	Param Intra 1 of 2

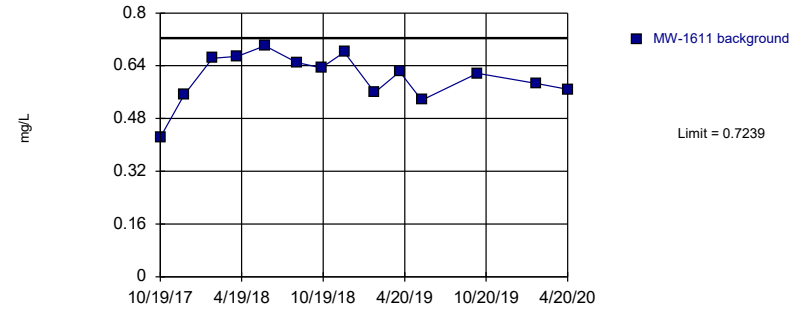
Prediction Limit  
Intrawell Parametric, MW-1610



Background Data Summary: Mean=0.064, Std. Dev.=0.03256, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8783, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

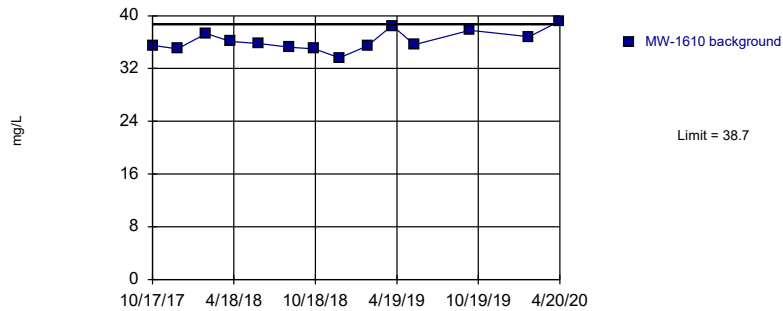
Prediction Limit  
Intrawell Parametric, MW-1611 (bg)



Background Data Summary: Mean=0.6044, Std. Dev.=0.07355, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9284, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

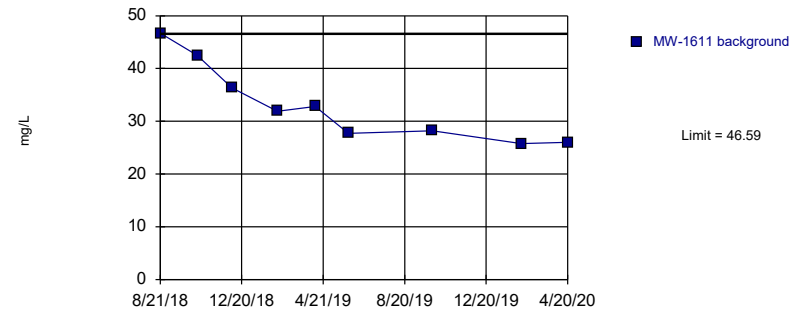
Prediction Limit  
Intrawell Parametric, MW-1610



Background Data Summary: Mean=36.2, Std. Dev.=1.537, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9461, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

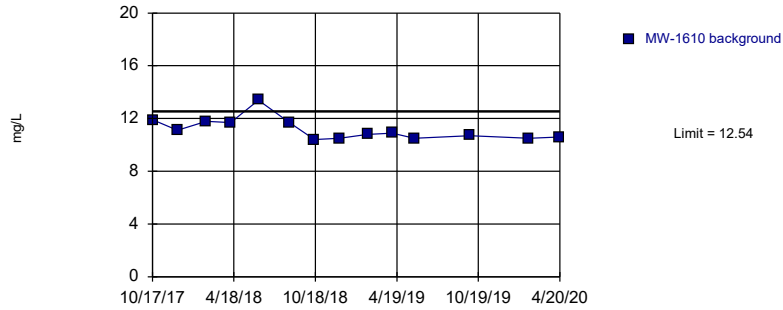
Prediction Limit  
Intrawell Parametric, MW-1611 (bg)



Background Data Summary: Mean=33.1, Std. Dev.=7.433, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8865, critical = 0.764. Kappa = 1.815 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

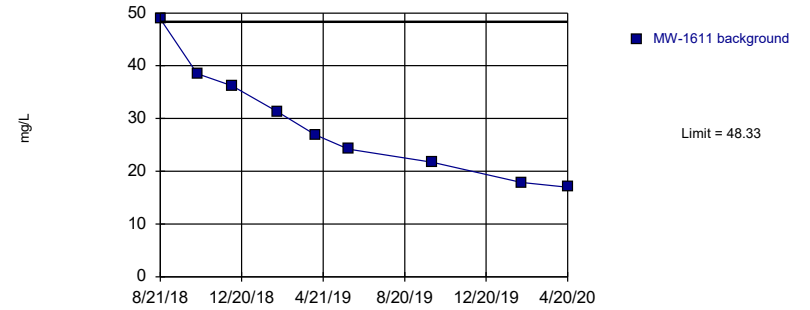
Prediction Limit  
Intrawell Parametric, MW-1610



Background Data Summary (based on square root transformation): Mean=3.341, Std. Dev.=0.1228, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8315, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Chloride total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

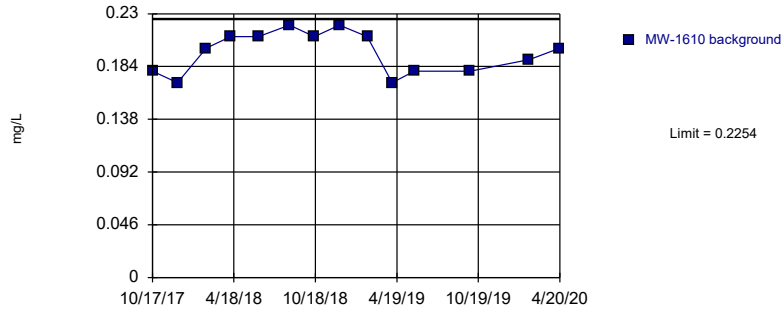
Prediction Limit  
Intrawell Parametric, MW-1611 (bg)



Background Data Summary: Mean=29.18, Std. Dev.=10.55, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.944, critical = 0.764. Kappa = 1.815 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Chloride total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

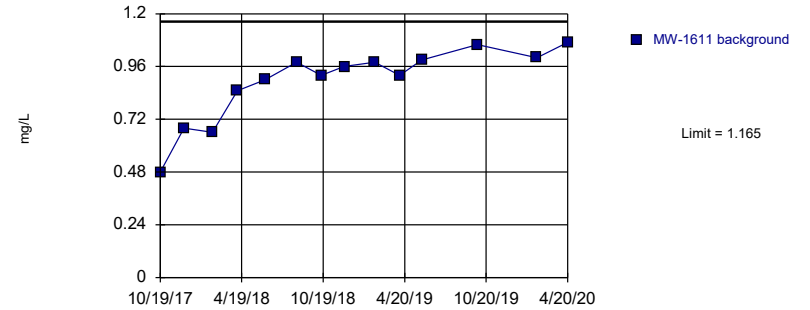
Prediction Limit  
Intrawell Parametric, MW-1610



Background Data Summary: Mean=0.1964, Std. Dev.=0.01781, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8971, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

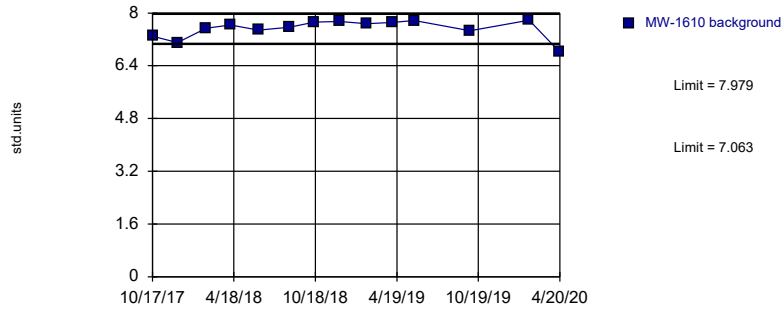
Prediction Limit  
Intrawell Parametric, MW-1611 (bg)



Background Data Summary: Mean=0.8893, Std. Dev.=0.1694, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8457, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

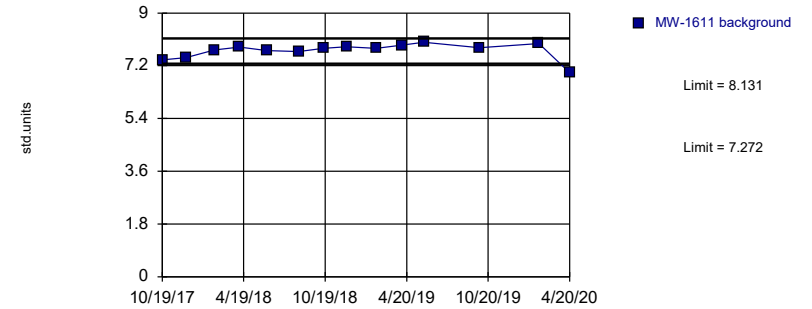
Prediction Limit  
Intrawell Parametric, MW-1610



Background Data Summary: Mean=7.521, Std. Dev.=0.2817, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8333, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

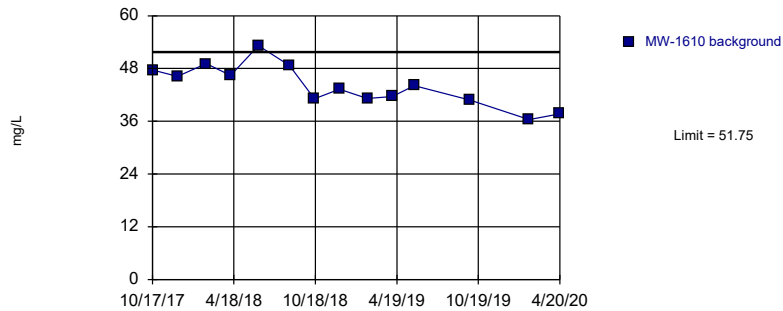
Prediction Limit  
Intrawell Parametric, MW-1611 (bg)



Background Data Summary (based on square transformation): Mean=59.5, Std. Dev.=4.07, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8352, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

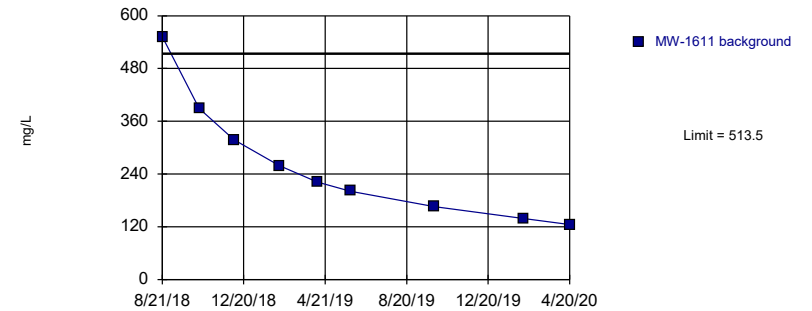
Prediction Limit  
Intrawell Parametric, MW-1610



Background Data Summary: Mean=44.11, Std. Dev.=4.699, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9756, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit  
Intrawell Parametric, MW-1611 (bg)

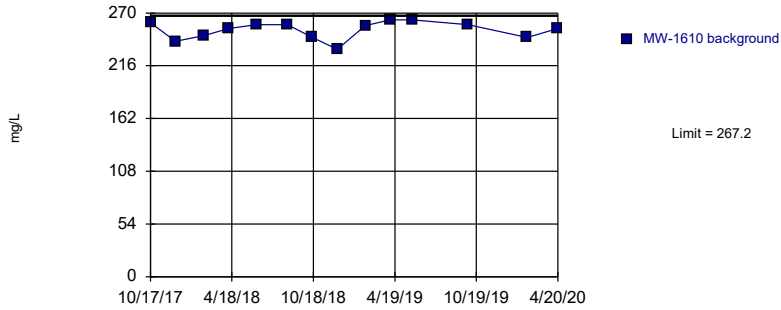


Background Data Summary: Mean=263.4, Std. Dev.=137.7, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8924, critical = 0.764. Kappa = 1.815 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Constituent: Sulfate total Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLs  
Clinch River LF Client: AEP Data: Clinch River

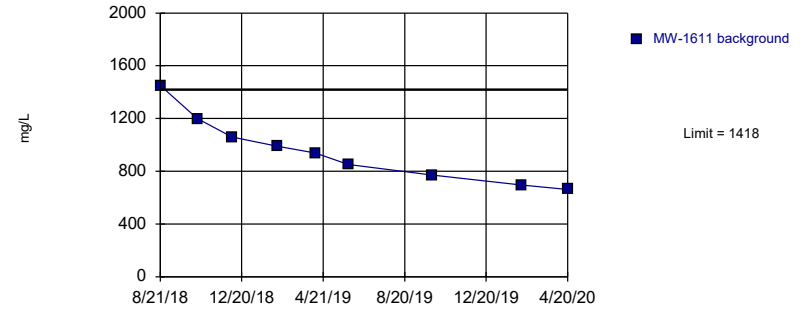


Prediction Limit  
Intrawell Parametric, MW-1610



Background Data Summary: Mean=252.6, Std. Dev.=8.976, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9064, critical = 0.825. Kappa = 1.626 (c=7, w=1, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Assumes 1 future value.

Prediction Limit  
Intrawell Parametric, MW-1611 (bg)



Background Data Summary: Mean=957.8, Std. Dev.=253.5, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9452, critical = 0.764. Kappa = 1.815 (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 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLS  
Clinch River LF Client: AEP Data: Clinch River

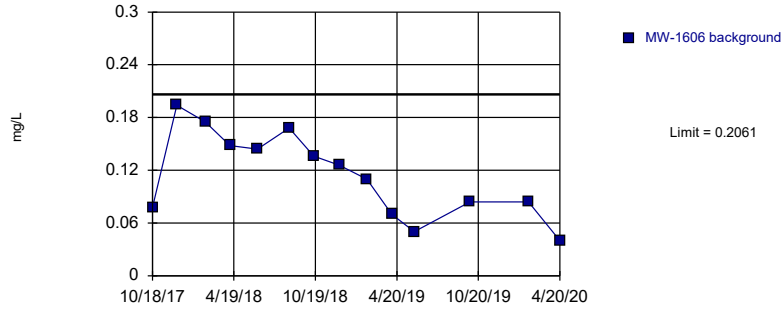
Constituent: Total Dissolved Solids Analysis Run 1/26/2022 1:44 PM View: Dumps Fault - Pond 1 PLS  
Clinch River LF Client: AEP Data: Clinch River

# Intrawell Prediction Limits - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 3:05 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	0.2061	n/a	n/a	1 future	n/a	14	0.1148	0.0483	0	None	No	0.003756	Param Intra 1 of 2
Boron total (mg/L)	MW-1607	0.1846	n/a	n/a	1 future	n/a	14	0.3568	0.03848	0	None	sqrt(x)	0.003756	Param Intra 1 of 2
Boron total (mg/L)	MW-1609	0.1026	n/a	n/a	1 future	n/a	14	0.1867	0.07068	42.86	Kaplan-Meier	sqrt(x)	0.003756	Param Intra 1 of 2
Calcium total (mg/L)	MW-1606	65.76	n/a	n/a	1 future	n/a	14	56.66	4.81	0	None	No	0.003756	Param Intra 1 of 2
Calcium total (mg/L)	MW-1607	53.07	n/a	n/a	1 future	n/a	14	48.04	2.661	0	None	No	0.003756	Param Intra 1 of 2
Calcium total (mg/L)	MW-1609	80.62	n/a	n/a	1 future	n/a	14	69.25	6.011	0	None	No	0.003756	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1606	0.2888	n/a	n/a	1 future	n/a	14	0.2043	0.04467	0	None	No	0.003756	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1607	0.272	n/a	n/a	1 future	n/a	14	0.2236	0.0256	0	None	No	0.003756	Param Intra 1 of 2
Fluoride total (mg/L)	MW-1609	0.3385	n/a	n/a	1 future	n/a	14	0.2614	0.04074	0	None	No	0.003756	Param Intra 1 of 2
pH [field] (std.units)	MW-1606	7.45	6.682	n/a	1 future	n/a	14	7.066	0.2031	0	None	No	0.001878	Param Intra 1 of 2
pH [field] (std.units)	MW-1607	8.28	7.177	n/a	1 future	n/a	14	28978	5255	0	None	x^5	0.001878	Param Intra 1 of 2
pH [field] (std.units)	MW-1609	7.846	6.589	n/a	1 future	n/a	14	21083	4579	0	None	x^5	0.001878	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1606	383.7	n/a	n/a	1 future	n/a	14	336.6	24.86	0	None	No	0.003756	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1607	315.9	n/a	n/a	1 future	n/a	12	291.3	12.57	0	None	No	0.003756	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-1609	350.3	n/a	n/a	1 future	n/a	14	300.9	26.08	0	None	No	0.003756	Param Intra 1 of 2

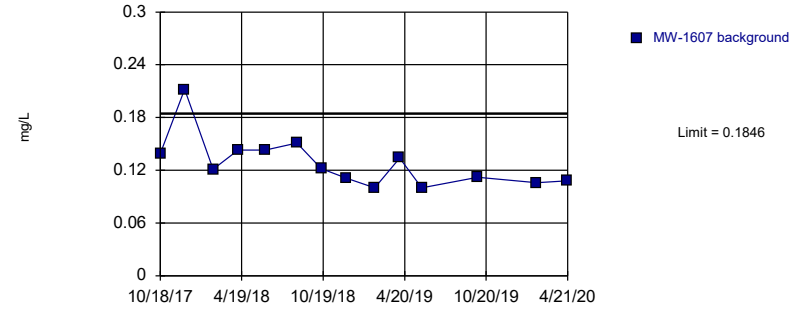
Prediction Limit  
Intrawell Parametric, MW-1606



Background Data Summary: Mean=0.1148, Std. Dev.=0.0483, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9603, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

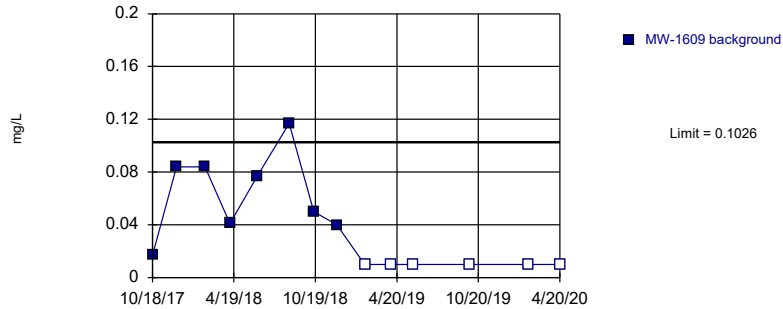
Prediction Limit  
Intrawell Parametric, MW-1607



Background Data Summary (based on square root transformation): Mean=0.3568, Std. Dev.=0.03848, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8621, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

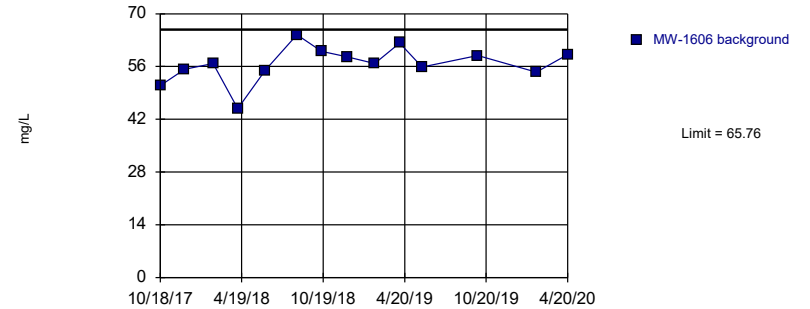
Prediction Limit  
Intrawell Parametric, MW-1609 (bg)



Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.1867, Std. Dev.=0.07068, n=14, 42.86% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8309, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Boron total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

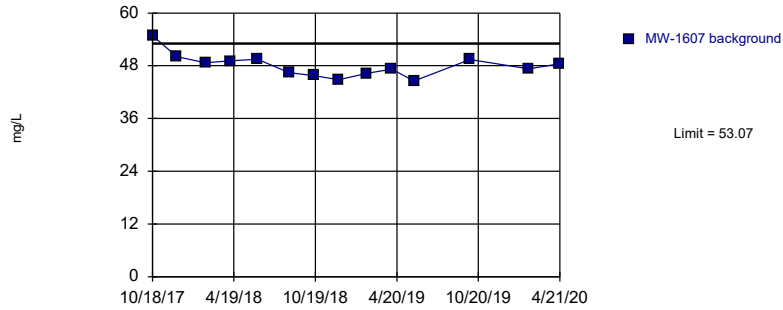
Prediction Limit  
Intrawell Parametric, MW-1606



Background Data Summary: Mean=56.66, Std. Dev.=4.81, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9379, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

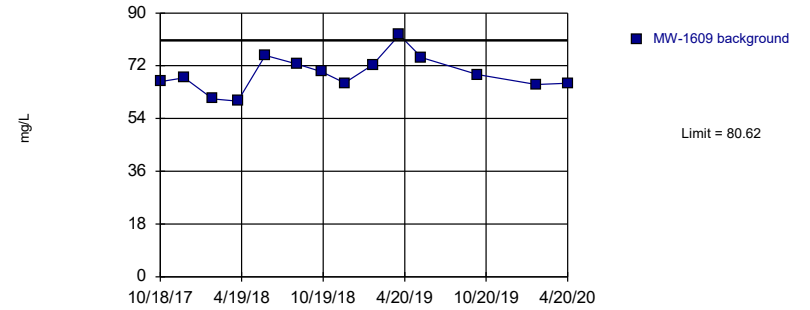
Prediction Limit  
Intrawell Parametric, MW-1607



Background Data Summary: Mean=48.04, Std. Dev.=2.661, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9115, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

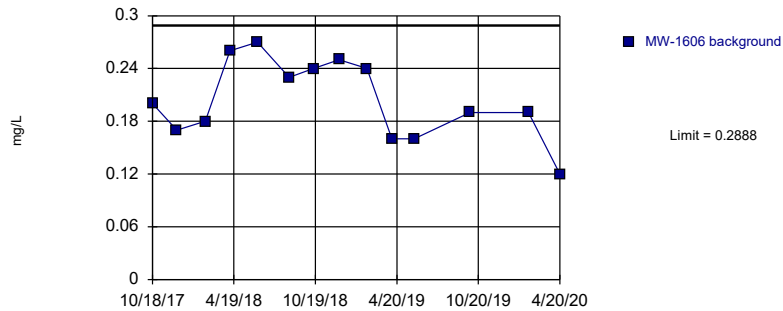
Prediction Limit  
Intrawell Parametric, MW-1609 (bg)



Background Data Summary: Mean=69.25, Std. Dev.=6.011, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9633, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Calcium total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

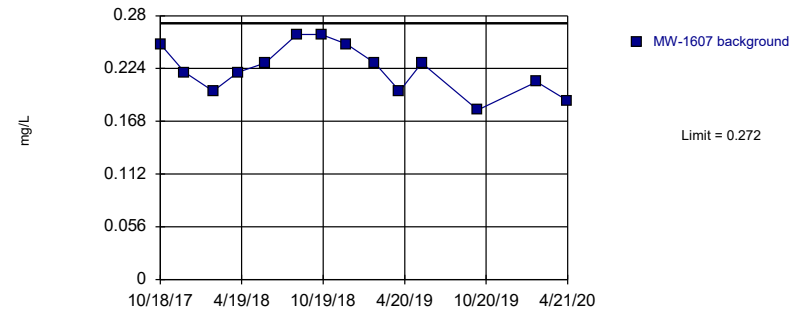
Prediction Limit  
Intrawell Parametric, MW-1606



Background Data Summary: Mean=0.2043, Std. Dev.=0.04467, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9536, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

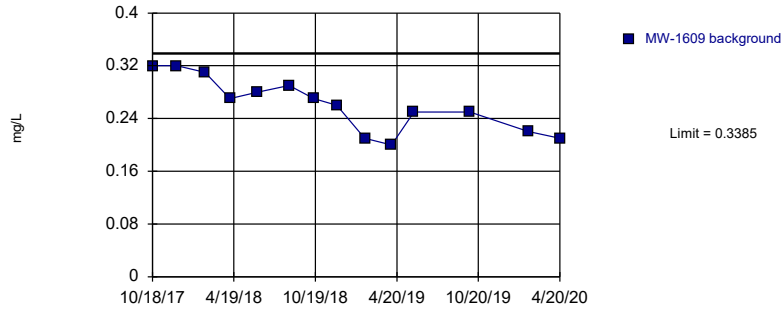
Prediction Limit  
Intrawell Parametric, MW-1607



Background Data Summary: Mean=0.2236, Std. Dev.=0.0256, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9504, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

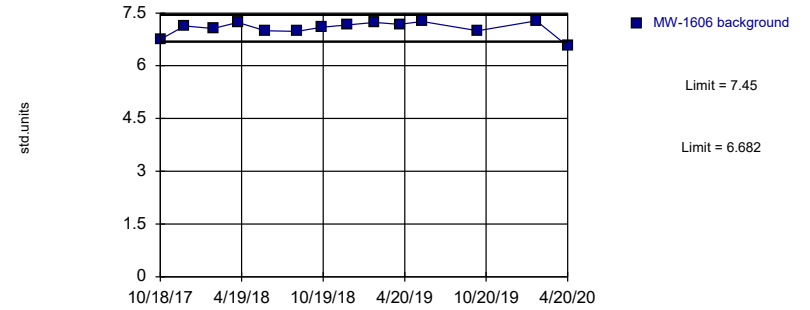
Prediction Limit  
Intrawell Parametric, MW-1609 (bg)



Background Data Summary: Mean=0.2614, Std. Dev.=0.04074, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9366, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: Fluoride total Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

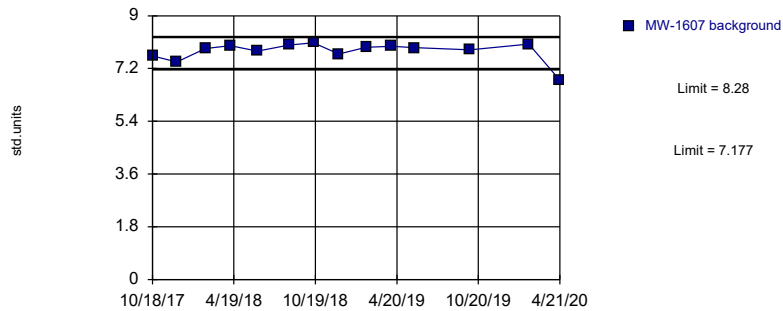
Prediction Limit  
Intrawell Parametric, MW-1606



Background Data Summary: Mean=7.066, Std. Dev.=0.2031, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8635, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

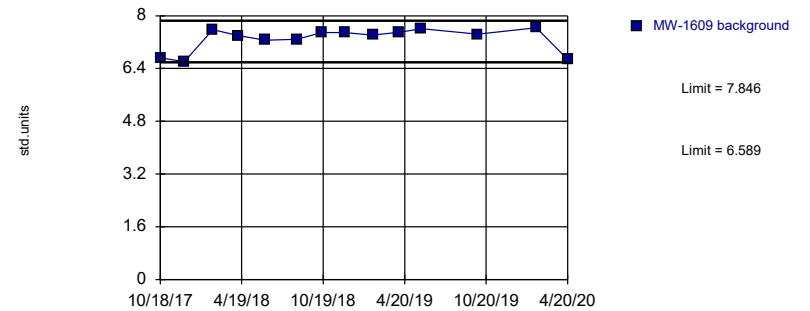
Prediction Limit  
Intrawell Parametric, MW-1607



Background Data Summary (based on x^5 transformation): Mean=28978, Std. Dev.=5255, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8287, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

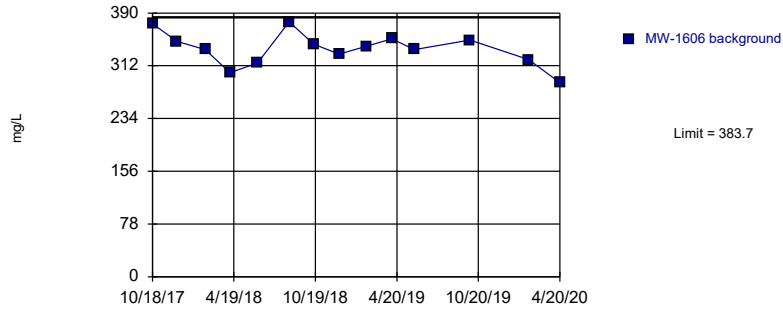
Prediction Limit  
Intrawell Parametric, MW-1609 (bg)



Background Data Summary (based on x^5 transformation): Mean=21083, Std. Dev.=4579, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.826, critical = 0.825. Kappa = 1.891 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.003756. Assumes 1 future value.

Constituent: pH [field] Analysis Run 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intrawell  
Clinch River LF Client: AEP Data: Clinch River

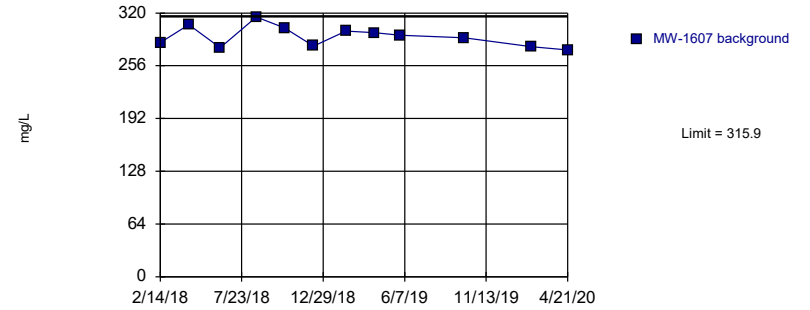
Prediction Limit  
Intrawell Parametric, MW-1606



Background Data Summary: Mean=336.6, Std. Dev.=24.86, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9701, critical = 0.825. Kappa = 1.891 (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 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intr Clinch River LF Client: AEP Data: Clinch River

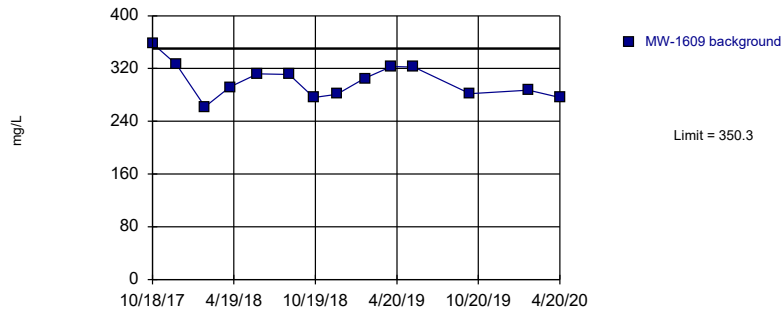
Prediction Limit  
Intrawell Parametric, MW-1607



Background Data Summary: Mean=291.3, Std. Dev.=12.57, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9509, critical = 0.805. Kappa = 1.952 (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 1/26/2022 3:04 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=300.9, Std. Dev.=26.08, n=14. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9513, critical = 0.825. Kappa = 1.891 (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 1/26/2022 3:04 PM View: Rome Limestone - Pond 1 Intr Clinch River LF Client: AEP Data: Clinch River

# Upgradient Wells Trend Tests - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:04 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Calcium total (mg/L)	MW-1602 (bg)	0.3363	80	68	Yes	18	0	n/a	n/a	0.01	NP
Chloride total (mg/L)	MW-1601 (bg)	-3.65	-72	-68	Yes	18	0	n/a	n/a	0.01	NP
Chloride total (mg/L)	MW-1608 (bg)	-0.632	-99	-68	Yes	18	0	n/a	n/a	0.01	NP

# Upgradient Wells Trend Tests - Chattanooga Shale - All Results

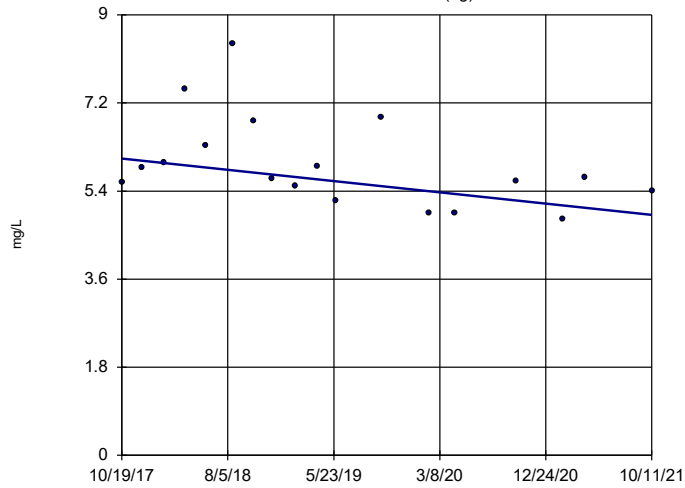
Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:04 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Calcium total (mg/L)	MW-1601 (bg)	-0.2893	-53	-68	No	18	0	n/a	n/a	0.01	NP
<b>Calcium total (mg/L)</b>	<b>MW-1602 (bg)</b>	<b>0.3363</b>	<b>80</b>	<b>68</b>	<b>Yes</b>	<b>18</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Calcium total (mg/L)	MW-1608 (bg)	-0.1544	-58	-68	No	18	0	n/a	n/a	0.01	NP
<b>Chloride total (mg/L)</b>	<b>MW-1601 (bg)</b>	<b>-3.65</b>	<b>-72</b>	<b>-68</b>	<b>Yes</b>	<b>18</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Chloride total (mg/L)	MW-1602 (bg)	-0.09489	-13	-68	No	18	0	n/a	n/a	0.01	NP
<b>Chloride total (mg/L)</b>	<b>MW-1608 (bg)</b>	<b>-0.632</b>	<b>-99</b>	<b>-68</b>	<b>Yes</b>	<b>18</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
pH [field] (std.units)	MW-1601 (bg)	0.0687	31	68	No	18	0	n/a	n/a	0.01	NP
pH [field] (std.units)	MW-1602 (bg)	-0.007019	-8	-68	No	18	0	n/a	n/a	0.01	NP
pH [field] (std.units)	MW-1608 (bg)	-0.02005	-18	-68	No	18	0	n/a	n/a	0.01	NP



### Sen's Slope Estimator

MW-1601 (bg)

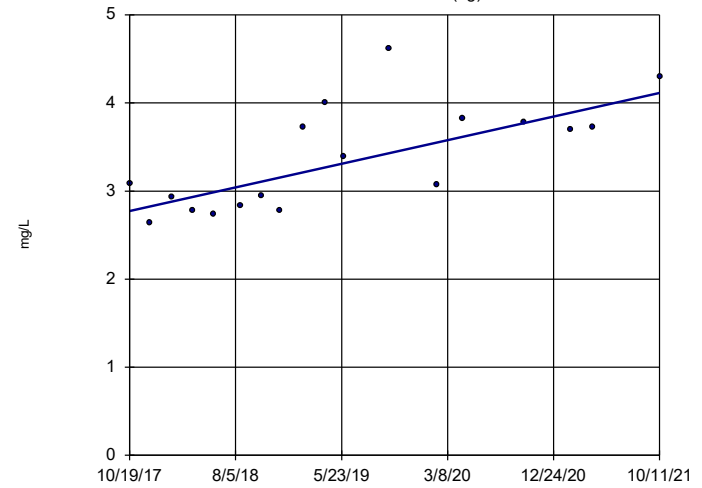


n = 18  
 Slope = -0.2893  
 units per year.  
 Mann-Kendall  
 statistic = -53  
 critical = -68  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Calcium total Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
 Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

MW-1602 (bg)

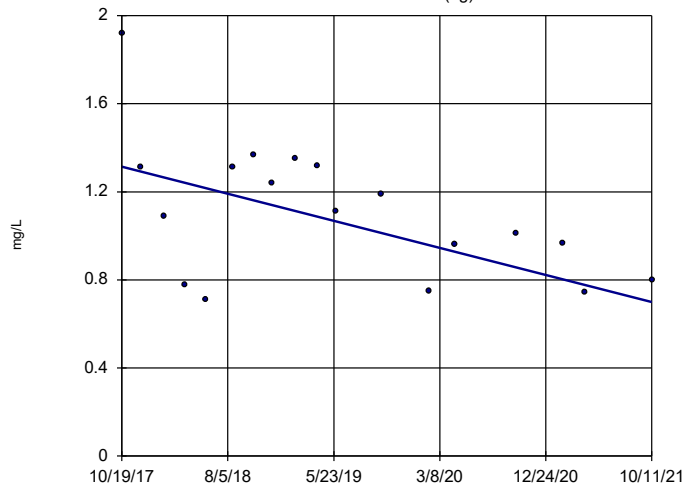


n = 18  
 Slope = 0.3363  
 units per year.  
 Mann-Kendall  
 statistic = 80  
 critical = 68  
 Increasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Calcium total Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
 Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

MW-1608 (bg)

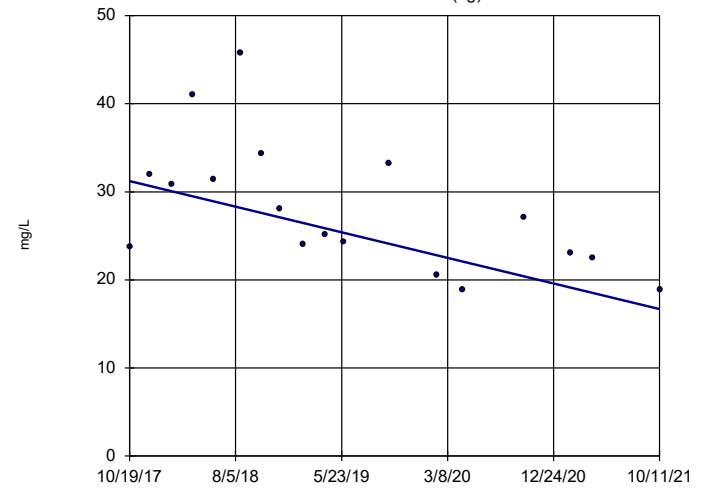


n = 18  
 Slope = -0.1544  
 units per year.  
 Mann-Kendall  
 statistic = -58  
 critical = -68  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Calcium total Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
 Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

MW-1601 (bg)

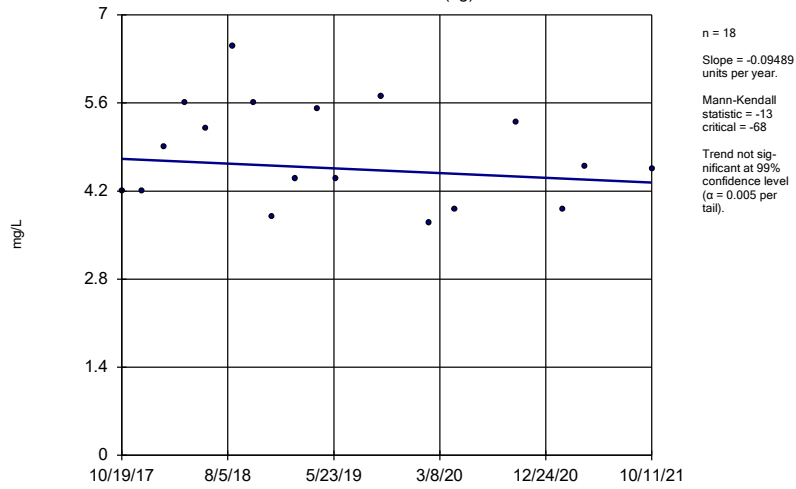


n = 18  
 Slope = -3.65  
 units per year.  
 Mann-Kendall  
 statistic = -72  
 critical = -68  
 Decreasing trend  
 significant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Chloride total Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
 Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

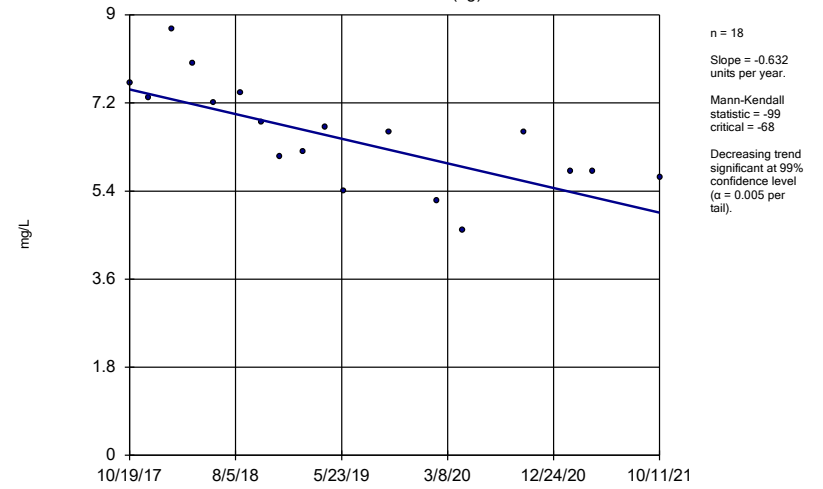
MW-1602 (bg)



Constituent: Chloride total Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

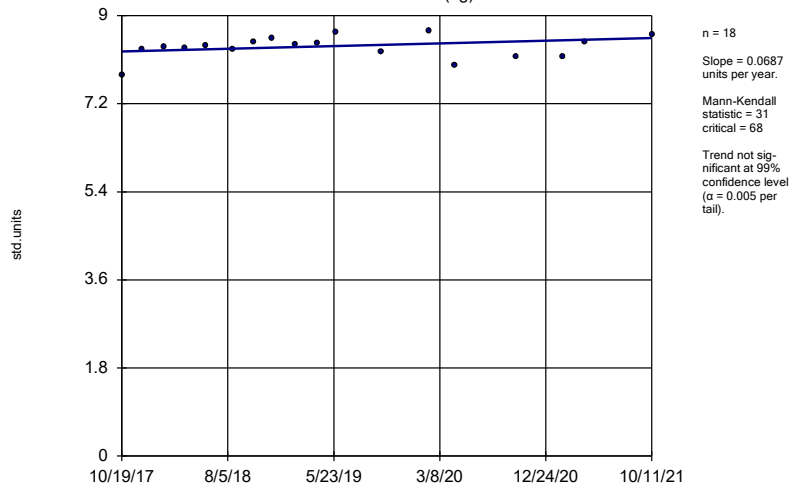
MW-1608 (bg)



Constituent: Chloride total Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

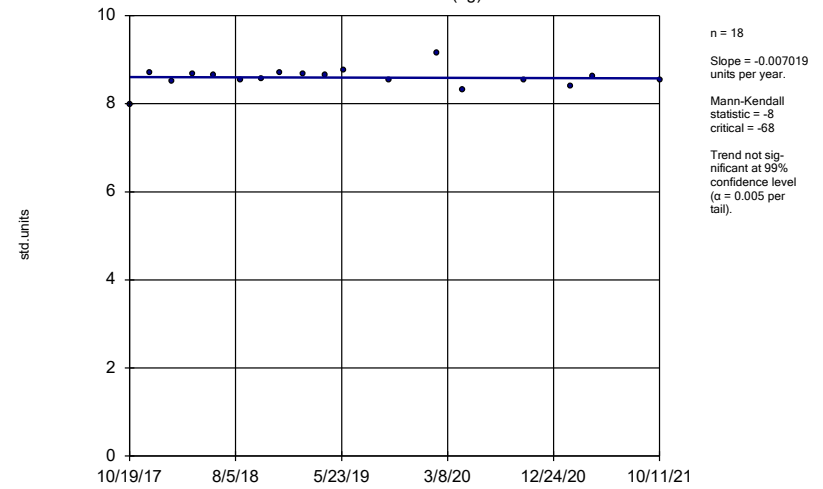
MW-1601 (bg)



Constituent: pH [field] Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

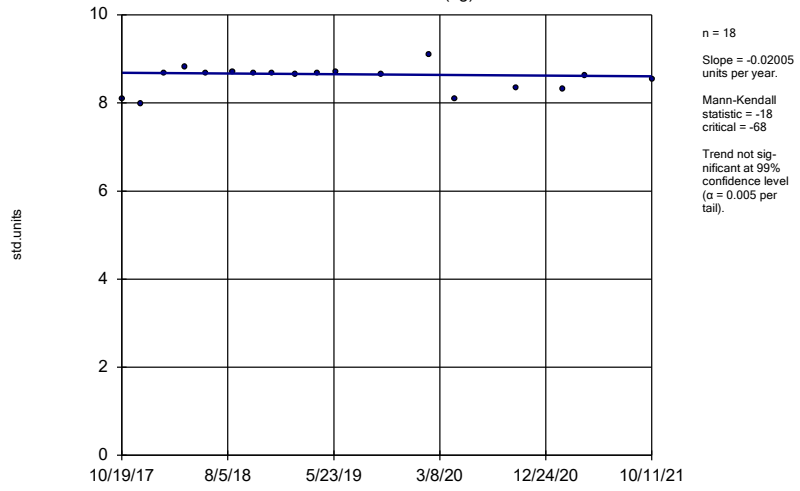
MW-1602 (bg)



Constituent: pH [field] Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

MW-1608 (bg)



Constituent: pH [field] Analysis Run 1/26/2022 2:03 PM View: Chattanooga Shale - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

# Upgradient Wells Trend Tests - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 3:10 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)	-0.33	-95	-68	Yes	18	0	n/a	n/a	0.01	NP

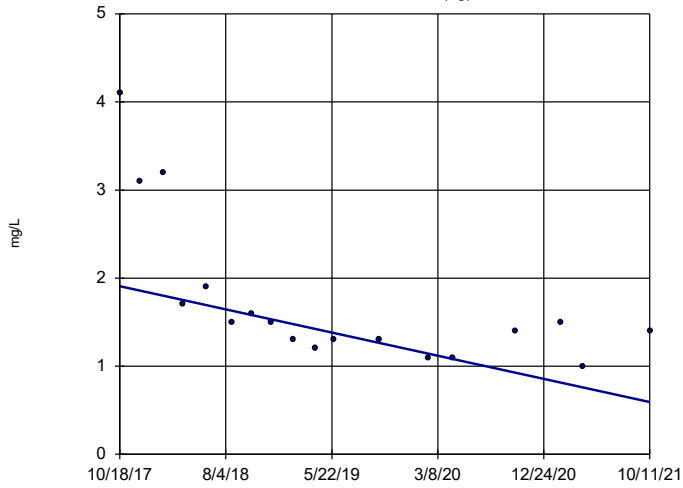
# Upgradient Wells Trend Tests - Rome Limestone - All Results

Clinch River LF    Client: AEP    Data: Clinch River    Printed 1/26/2022, 3:10 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)	-0.33	-95	-68	Yes	18	0	n/a	n/a	0.01	NP
Sulfate total (mg/L)	MW-1609 (bg)	-0.4787	-21	-68	No	18	0	n/a	n/a	0.01	NP

### Sen's Slope Estimator

MW-1609 (bg)

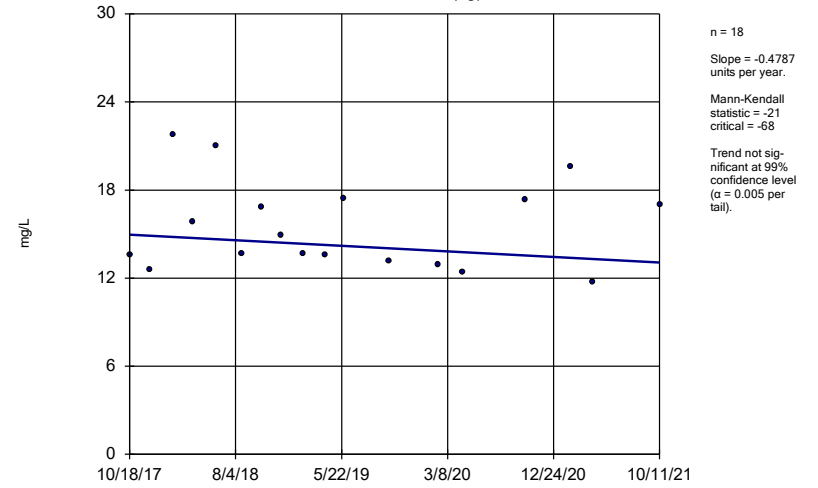


n = 18  
Slope = -0.33  
units per year.  
Mann-Kendall  
statistic = -95  
critical = -68  
Decreasing trend  
significant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Chloride total Analysis Run 1/26/2022 3:09 PM View: Rome Limestone - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

### Sen's Slope Estimator

MW-1609 (bg)



n = 18  
Slope = -0.4787  
units per year.  
Mann-Kendall  
statistic = -21  
critical = -68  
Trend not sig-  
nificant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

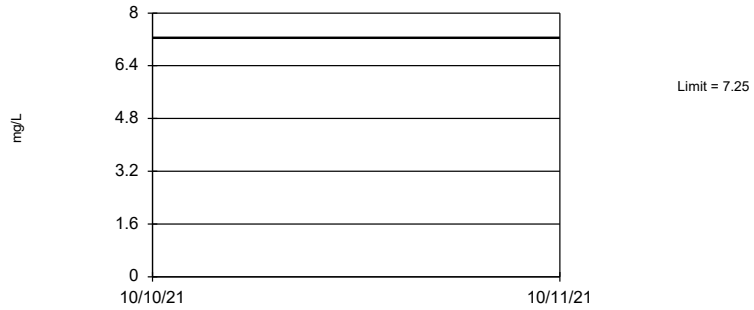
Constituent: Sulfate total Analysis Run 1/26/2022 3:09 PM View: Rome Limestone - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

# Interwell Prediction Limits - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/26/2022, 2:07 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bq N</u>	<u>Bq Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Calcium total (mg/L)	n/a	7.25	n/a	n/a	4 future	n/a	54	3.48	2.101	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	54	n/a	n/a	0	n/a	n/a	0.0006568	NP Inter (normality) 1 of 2
pH [field] (std.units)	n/a	8.96	8.013	n/a	4 future	n/a	54	72.25	4.48	0	None	x^2	0.0009398	Param Inter 1 of 2

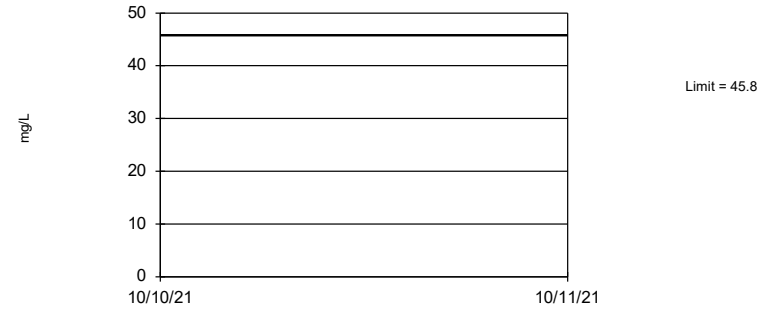
Prediction Limit  
Interwell Parametric



Background Data Summary: Mean=3.48, Std. Dev.=2.101, n=54. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9479, critical = 0.939. Kappa = 1.794 (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 1/26/2022 2:06 PM View: Chattanooga Shale - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

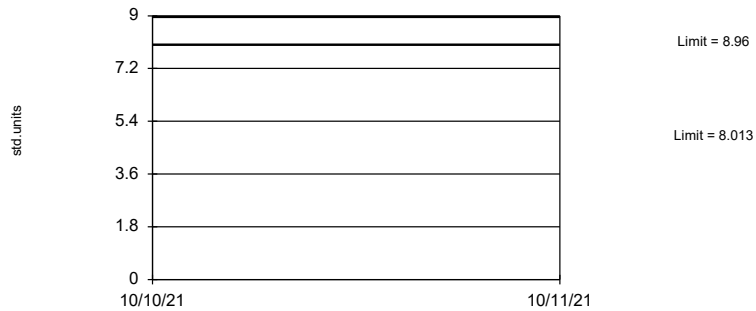
Prediction Limit  
Interwell Non-parametric



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 54 background values. Annual per-constituent alpha = 0.005242. Individual comparison alpha = 0.0006568 (1 of 2). Assumes 4 future values.

Constituent: Chloride total Analysis Run 1/26/2022 2:06 PM View: Chattanooga Shale - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit  
Interwell Parametric



Background Data Summary (based on square transformation): Mean=72.25, Std. Dev.=4.48, n=54. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.939, critical = 0.939. Kappa = 1.794 (c=7, w=4, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0009398. Assumes 4 future values.

Constituent: pH [field] Analysis Run 1/26/2022 2:06 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 1/26/2022, 3:11 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bq N	Bq 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	18	n/a	n/a	0	n/a	n/a	0.005258	NP Inter (normality) 1 of 2
Sulfate total (mg/L)	n/a	20.91	n/a	n/a	2 future	n/a	18	15.5	3.031	0	None	No	0.003756	Param Inter 1 of 2

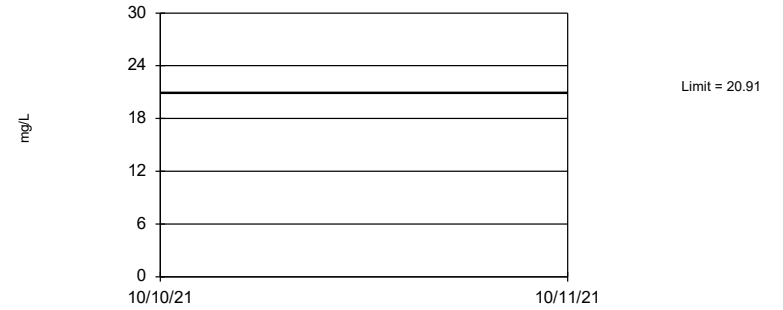
Prediction Limit  
Interwell Non-parametric



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 18 background values. Annual per-constituent alpha = 0.02087. Individual comparison alpha = 0.005258 (1 of 2). Assumes 2 future values.

Constituent: Chloride total Analysis Run 1/26/2022 3:10 PM View: Rome Limestone - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

Prediction Limit  
Interwell Parametric



Background Data Summary: Mean=15.5, Std. Dev.=3.031, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9037, critical = 0.858. Kappa = 1.786 (c=7, w=2, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.003756. Assumes 2 future values.

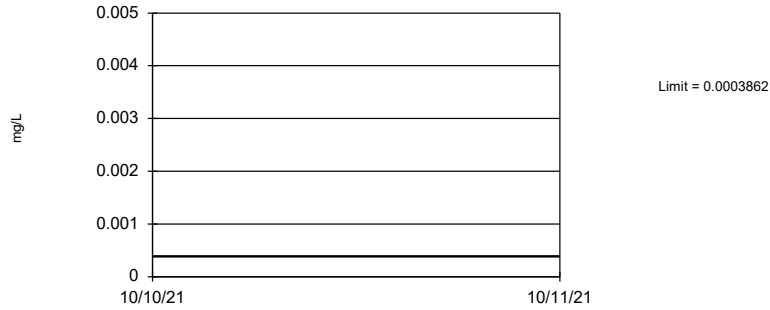
Constituent: Sulfate total Analysis Run 1/26/2022 3:10 PM View: Rome Limestone - Pond 1 Interwell  
Clinch River LF Client: AEP Data: Clinch River

# Tolerance Limits Summary Table - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:49 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	n/a	0.0003862	n/a	n/a	n/a	54	-9.447	0.7777	1.852	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.0258	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Barium total (mg/L)	n/a	0.306	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Beryllium total (mg/L)	n/a	0.000066	n/a	n/a	n/a	54	n/a	n/a	61.11	n/a	n/a	0.06267	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00003	n/a	n/a	n/a	54	n/a	n/a	85.19	n/a	n/a	0.06267	NP Inter(NDs)
Chromium total (mg/L)	n/a	0.001218	n/a	n/a	n/a	54	-8.094	0.6772	0	None	ln(x)	0.05	Inter
Cobalt total (mg/L)	n/a	0.0004159	n/a	n/a	n/a	54	0.04677	0.01365	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	2.746	n/a	n/a	n/a	54	0.8862	0.2518	0	None	x^(1/3)	0.05	Inter
Fluoride total (mg/L)	n/a	2.42	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Lead total (mg/L)	n/a	0.0005623	n/a	n/a	n/a	54	0.04698	0.01741	18.52	Kaplan-Meier	x^(1/3)	0.05	Inter
Lithium total (mg/L)	n/a	0.118	n/a	n/a	n/a	54	n/a	n/a	1.852	n/a	n/a	0.06267	NP Inter(normality)
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	54	n/a	n/a	87.04	n/a	n/a	0.06267	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.01532	n/a	n/a	n/a	54	-5.853	0.8202	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0005	n/a	n/a	n/a	54	n/a	n/a	40.74	n/a	n/a	0.06267	NP Inter(normality)
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	54	n/a	n/a	74.07	n/a	n/a	0.06267	NP Inter(NDs)

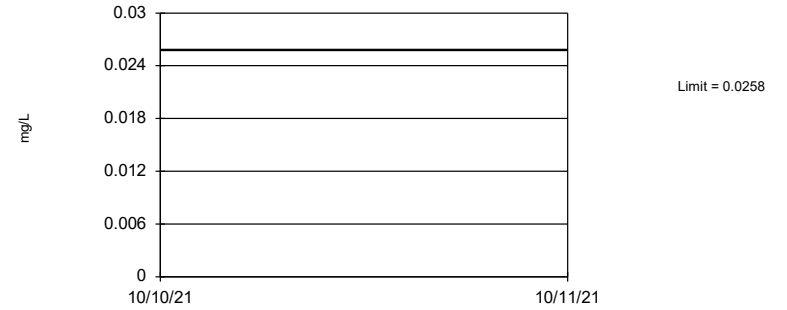
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-9.447, Std. Dev.=0.7777, n=54, 1.852% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9737, critical = 0.939. Report alpha = 0.05.

Constituent: Antimony total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

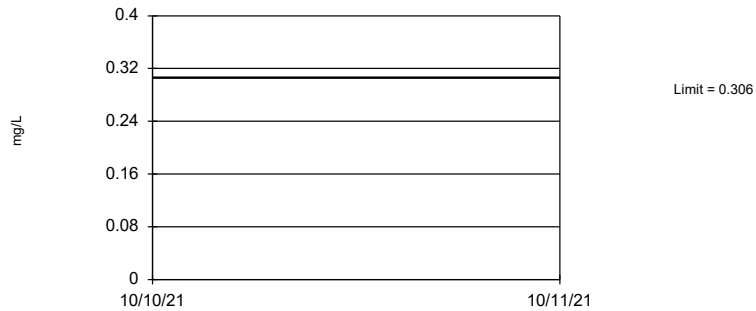
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 54 background values. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Arsenic total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

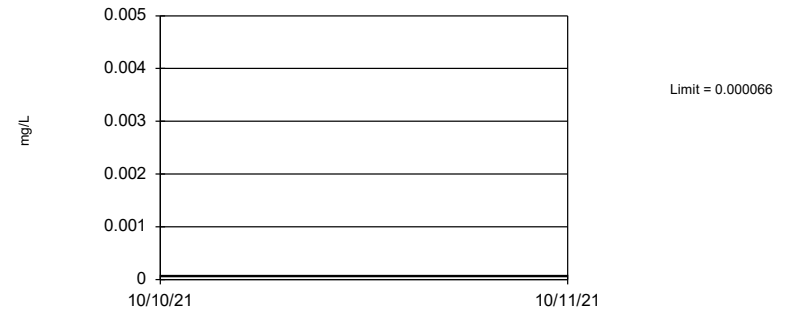
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 54 background values. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Barium total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

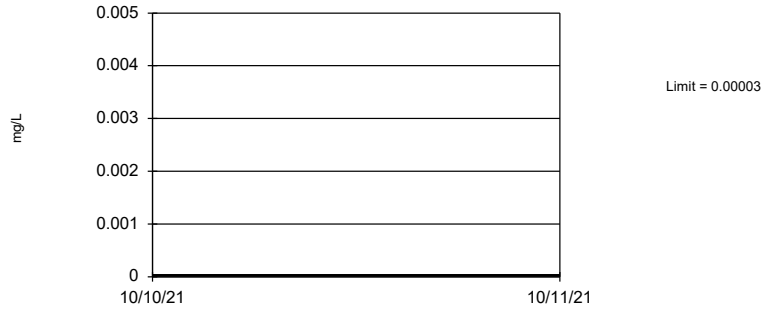
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 54 background values. 61.11% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Beryllium total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

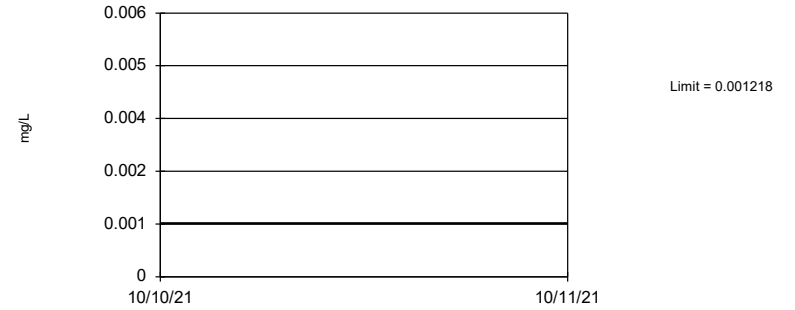
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 54 background values. 85.19% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Cadmium total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

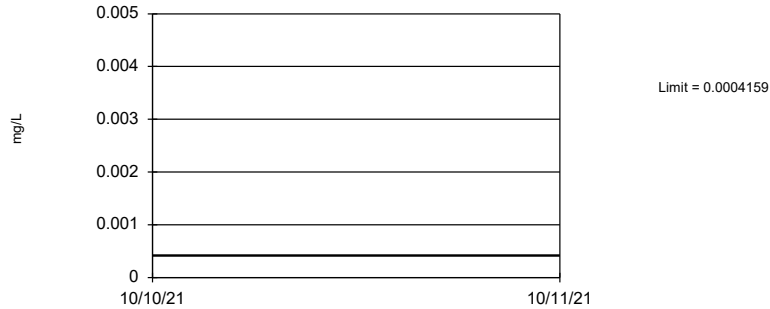
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-8.094, Std. Dev.=0.6772, n=54. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9549, critical = 0.939. Report alpha = 0.05.

Constituent: Chromium total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

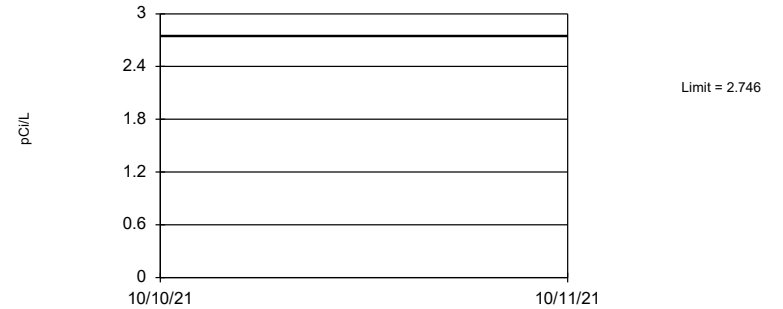
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation): Mean=0.04677, Std. Dev.=0.01365, n=54. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9593, critical = 0.939. Report alpha = 0.05.

Constituent: Cobalt total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

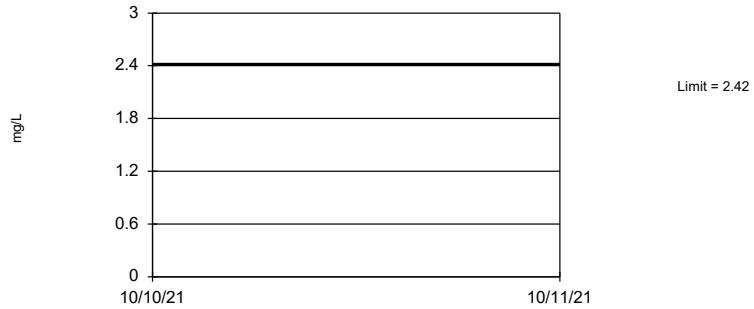
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation): Mean=0.8862, Std. Dev.=0.2518, n=54. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9469, critical = 0.939. Report alpha = 0.05.

Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale -  
Clinch River LF Client: AEP Data: Clinch River

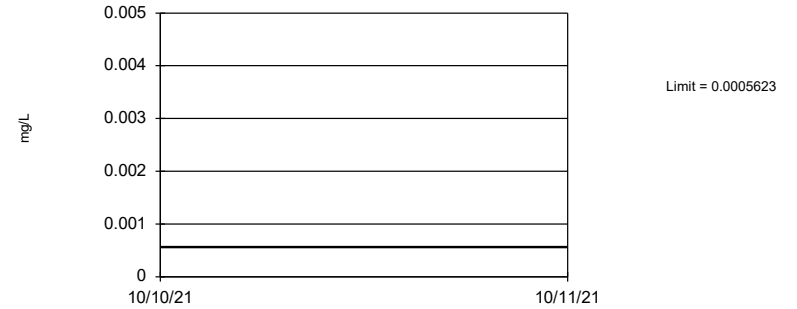
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 54 background values. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Fluoride total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation) (after Kaplan-Meier Adjustment): Mean=0.04698, Std. Dev.=0.01741, n=54, 18.52% NDs. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9538, critical = 0.939. Report alpha = 0.05.

Constituent: Lead total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 54 background values. 1.852% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Lithium total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 54 background values. 87.04% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Mercury total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

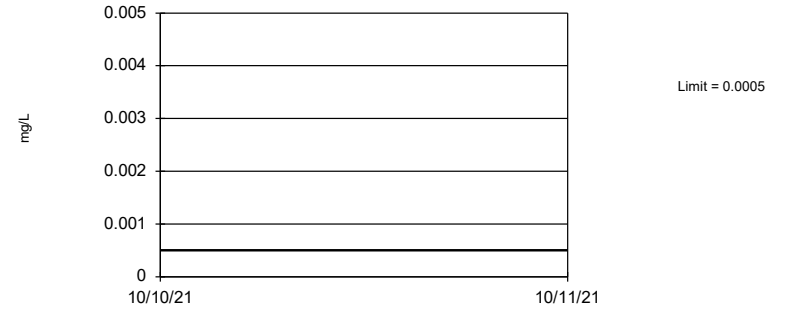
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-5.853, Std. Dev.=0.8202, n=54. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.9497, critical = 0.939. Report alpha = 0.05.

Constituent: Molybdenum total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLS  
Clinch River LF Client: AEP Data: Clinch River

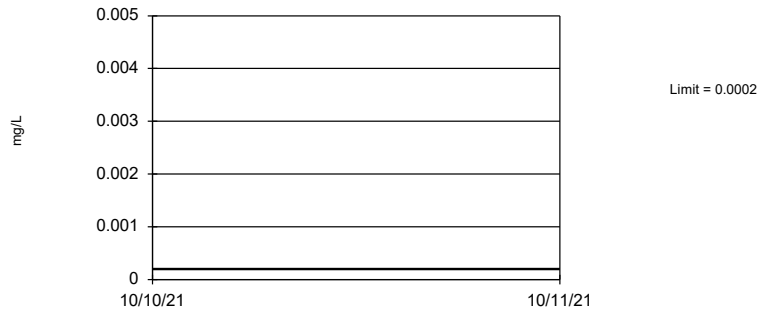
### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 54 background values. 40.74% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Selenium total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLS  
Clinch River LF Client: AEP Data: Clinch River

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 54 background values. 74.07% NDs. 91.99% coverage at alpha=0.01; 94.73% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.06267.

Constituent: Thallium total Analysis Run 1/24/2022 3:48 PM View: Chattanooga Shale - Pond 1 UTLS  
Clinch River LF Client: AEP Data: Clinch River

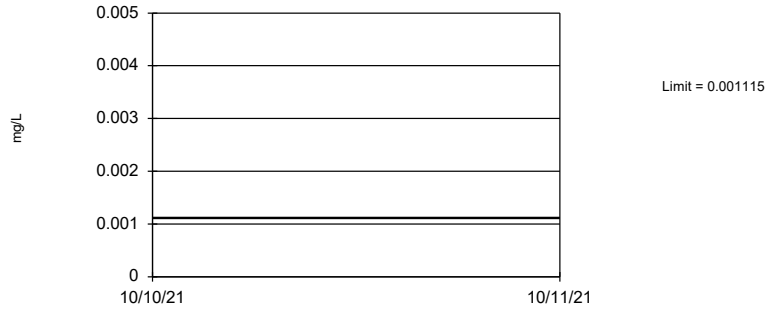
# Tolerance Limits Summary Table - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:42 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	n/a	0.001115	n/a	n/a	n/a	18	-9.523	1.11	0	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.04569	n/a	n/a	n/a	18	0.2341	0.05031	0	None	x^(1/3)	0.05	Inter
Barium total (mg/L)	n/a	0.2008	n/a	n/a	n/a	18	0.09569	0.04287	0	None	No	0.05	Inter
Beryllium total (mg/L)	n/a	0.00005	n/a	n/a	n/a	18	n/a	n/a	72.22	n/a	n/a	0.3972	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00002	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Chromium total (mg/L)	n/a	0.0009625	n/a	n/a	n/a	18	0.000422	0.0002203	0	None	No	0.05	Inter
Cobalt total (mg/L)	n/a	0.0001438	n/a	n/a	n/a	17	0.00005629	0.00003521	0	None	No	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	1.935	n/a	n/a	n/a	18	n/a	n/a	0	n/a	n/a	0.3972	NP Inter(normality)
Fluoride total (mg/L)	n/a	1.356	n/a	n/a	n/a	18	0.9283	0.1742	0	None	No	0.05	Inter
Lead total (mg/L)	n/a	0.0002117	n/a	n/a	n/a	17	0.00009664	0.00004628	29.41	Kaplan-Meier	No	0.05	Inter
Lithium total (mg/L)	n/a	0.1649	n/a	n/a	n/a	18	0.2912	0.04683	0	None	sqrt(x)	0.05	Inter
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.006125	n/a	n/a	n/a	17	-6.077	0.395	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0003072	n/a	n/a	n/a	18	-9.559	0.5999	11.11	None	ln(x)	0.05	Inter
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	18	n/a	n/a	83.33	n/a	n/a	0.3972	NP Inter(NDs)



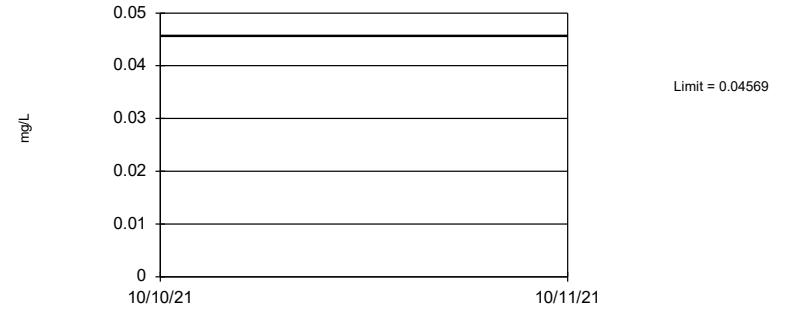
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-9.523, Std. Dev.=1.11, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9021, critical = 0.858. Report alpha = 0.05.

Constituent: Antimony total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

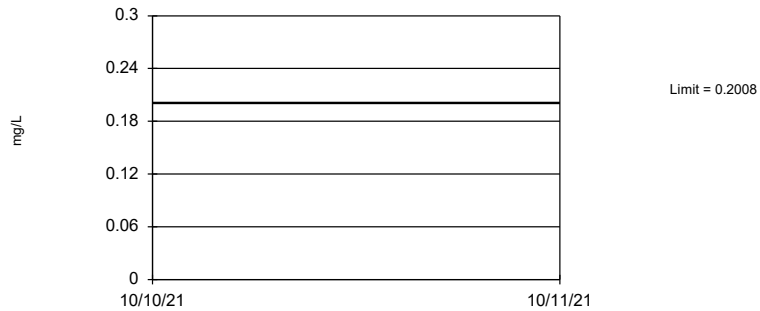
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on cube root transformation): Mean=0.2341, Std. Dev.=0.05031, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.864, critical = 0.858. Report alpha = 0.05.

Constituent: Arsenic total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

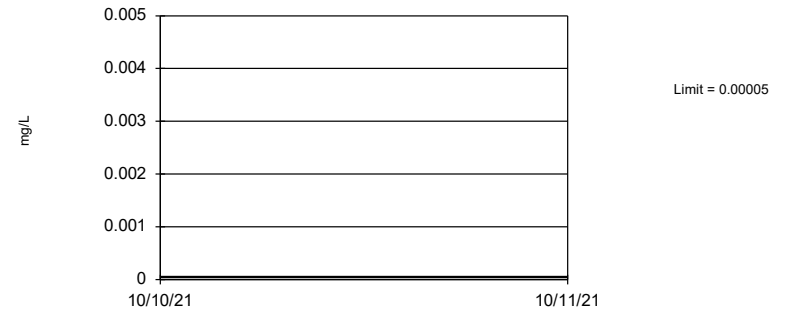
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary: Mean=0.09569, Std. Dev.=0.04287, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8779, critical = 0.858. Report alpha = 0.05.

Constituent: Barium total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 18 background values. 72.22% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Beryllium total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

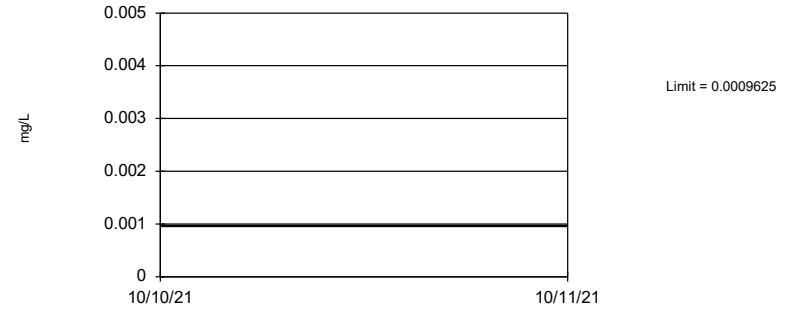
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Cadmium total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

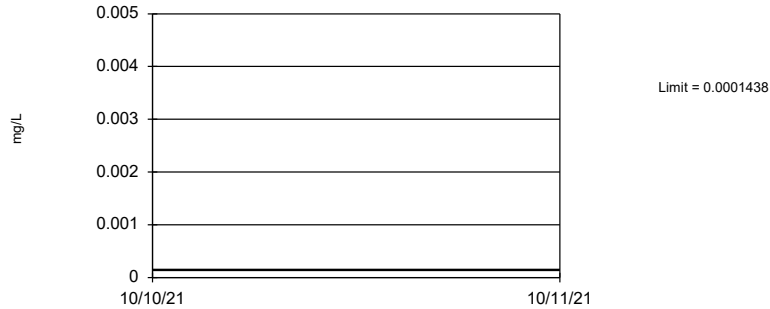
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary: Mean=0.000422, Std. Dev.=0.0002203, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9283, critical = 0.858. Report alpha = 0.05.

Constituent: Chromium total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary: Mean=0.00005629, Std. Dev.=0.00003521, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9002, critical = 0.851. Report alpha = 0.05.

Constituent: Cobalt total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

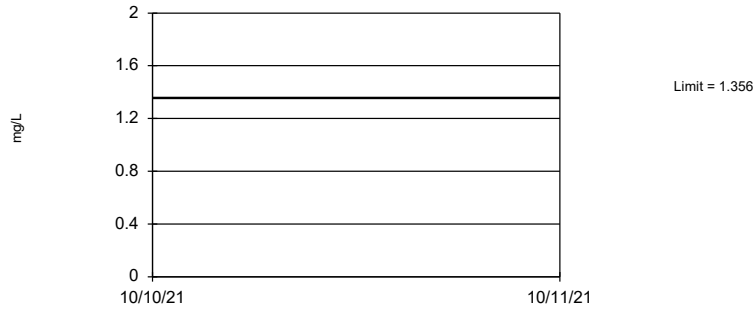
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 18 background values. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond  
Clinch River LF Client: AEP Data: Clinch River

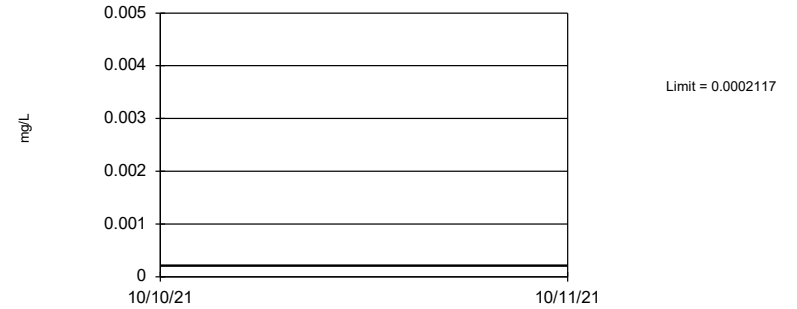
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary: Mean=0.9283, Std. Dev.=0.1742, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9034, critical = 0.858. Report alpha = 0.05.

Constituent: Fluoride total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.00009664, Std. Dev.=0.00004628, n=17, 29.41% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9125, critical = 0.851. Report alpha = 0.05.

Constituent: Lead total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=0.2912, Std. Dev.=0.04683, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.861, critical = 0.858. Report alpha = 0.05.

Constituent: Lithium total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

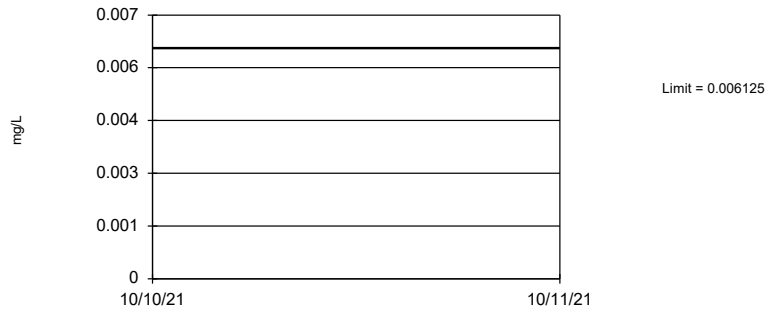
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Mercury total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

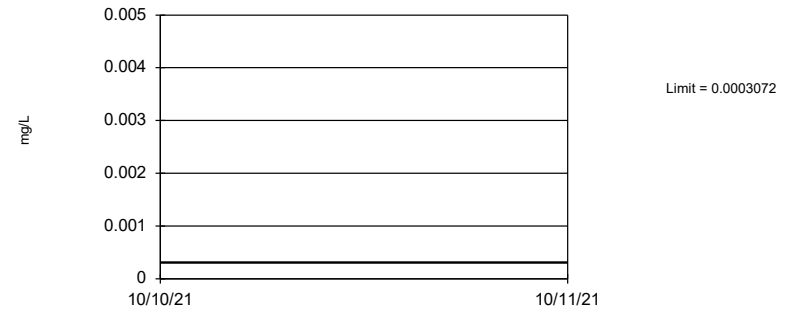
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-6.077, Std. Dev.=0.395, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8767, critical = 0.851. Report alpha = 0.05.

Constituent: Molybdenum total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

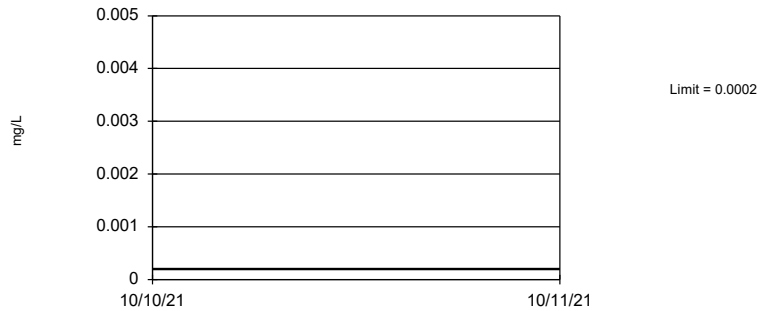
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on natural log transformation): Mean=-9.559, Std. Dev.=0.5999, n=18, 11.11% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8987, critical = 0.858. Report alpha = 0.05.

Constituent: Selenium total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 18 background values. 83.33% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

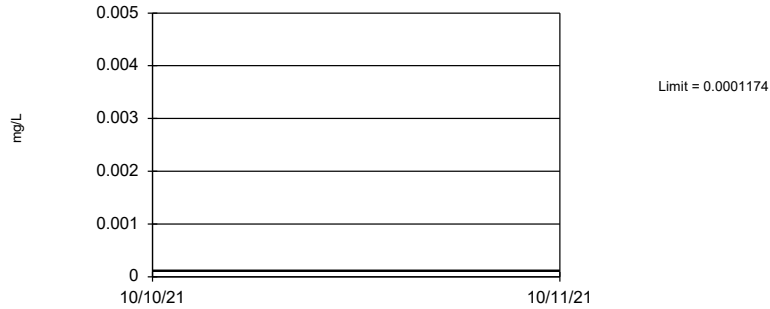
Constituent: Thallium total Analysis Run 1/24/2022 3:42 PM View: Dumps Fault - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

# Tolerance Limits Summary Table - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:53 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>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)	n/a	0.0001174	n/a	n/a	n/a	18	0.005925	0.002001	11.11	None	sqrt(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.00097	n/a	n/a	n/a	18	n/a	n/a	0	n/a	n/a	0.3972	NP Inter(normality)
Barium total (mg/L)	n/a	0.5258	n/a	n/a	n/a	18	0.3964	0.05273	0	None	No	0.05	Inter
Beryllium total (mg/L)	n/a	0.00005	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00004	n/a	n/a	n/a	18	n/a	n/a	22.22	n/a	n/a	0.3972	NP Inter(normality)
Chromium total (mg/L)	n/a	0.0003363	n/a	n/a	n/a	18	0.0001676	0.00006878	0	None	No	0.05	Inter
Cobalt total (mg/L)	n/a	0.001322	n/a	n/a	n/a	18	0.01437	0.008965	16.67	Kaplan-Meier	sqrt(x)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	5.185	n/a	n/a	n/a	18	1.394	0.3598	0	None	sqrt(x)	0.05	Inter
Fluoride total (mg/L)	n/a	0.3478	n/a	n/a	n/a	18	0.2572	0.03691	0	None	No	0.05	Inter
Lead total (mg/L)	n/a	0.001297	n/a	n/a	n/a	18	0.02016	0.006466	0	None	sqrt(x)	0.05	Inter
Lithium total (mg/L)	n/a	0.01	n/a	n/a	n/a	18	n/a	n/a	33.33	n/a	n/a	0.3972	NP Inter(normality)
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.002442	n/a	n/a	n/a	18	0.02529	0.009835	27.78	Kaplan-Meier	sqrt(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0004087	n/a	n/a	n/a	18	0.007751	0.005082	22.22	Kaplan-Meier	sqrt(x)	0.05	Inter
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	18	n/a	n/a	72.22	n/a	n/a	0.3972	NP Inter(NDs)

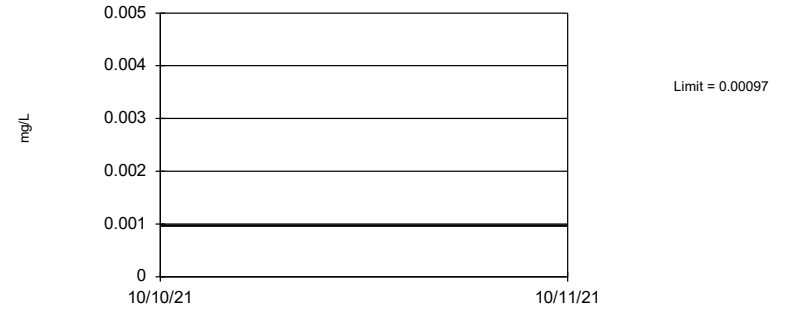
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=0.005925, Std. Dev.=0.002001, n=18, 11.11% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9111, critical = 0.858. Report alpha = 0.05.

Constituent: Antimony total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 18 background values. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Arsenic total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary: Mean=0.3964, Std. Dev.=0.05273, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9274, critical = 0.858. Report alpha = 0.05.

Constituent: Barium total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

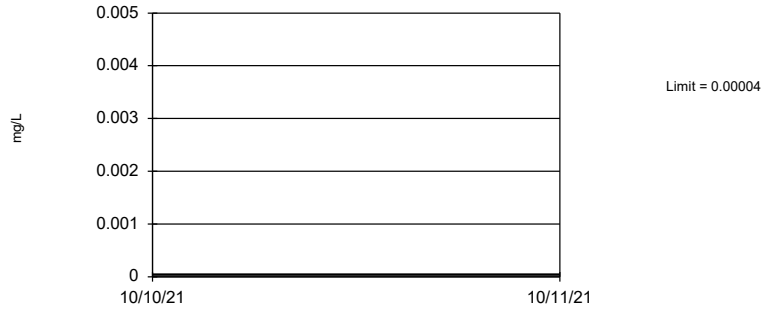
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Beryllium total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

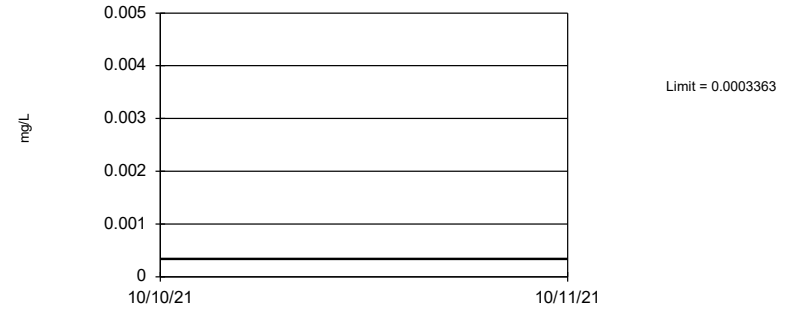
Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 18 background values. 22.22% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Cadmium total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary: Mean=0.0001676, Std. Dev.=0.00006878, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9417, critical = 0.858. Report alpha = 0.05.

Constituent: Chromium total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

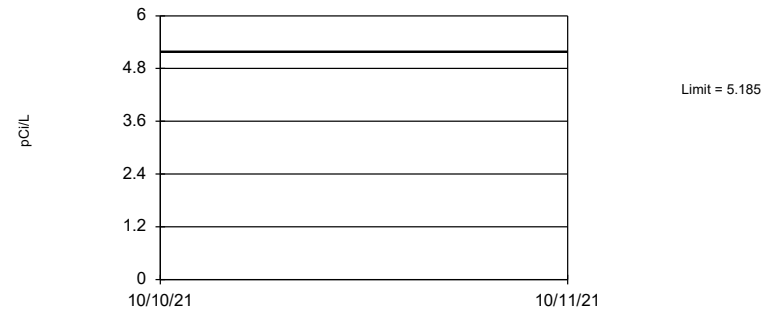
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.01437, Std. Dev.=0.008965, n=18, 16.67% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9333, critical = 0.858. Report alpha = 0.05.

Constituent: Cobalt total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=1.394, Std. Dev.=0.3598, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8663, critical = 0.858. Report alpha = 0.05.

Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - P  
Clinch River LF Client: AEP Data: Clinch River

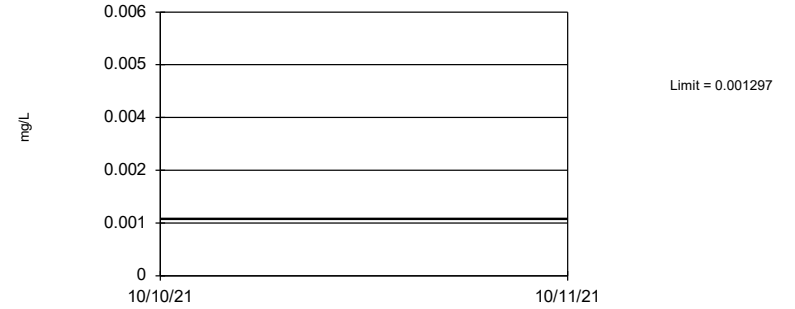
### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary: Mean=0.2572, Std. Dev.=0.03691, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9564, critical = 0.858. Report alpha = 0.05.

Constituent: Fluoride total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

### Tolerance Limit Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation): Mean=0.02016, Std. Dev.=0.006466, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9349, critical = 0.858. Report alpha = 0.05.

Constituent: Lead total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

### Tolerance Limit Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 18 background values. 33.33% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Lithium total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

### Tolerance Limit Interwell Non-parametric

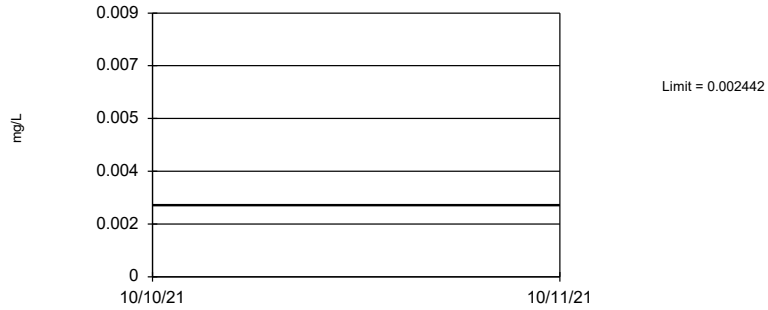


Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 18 background values. 94.44% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Mercury total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River



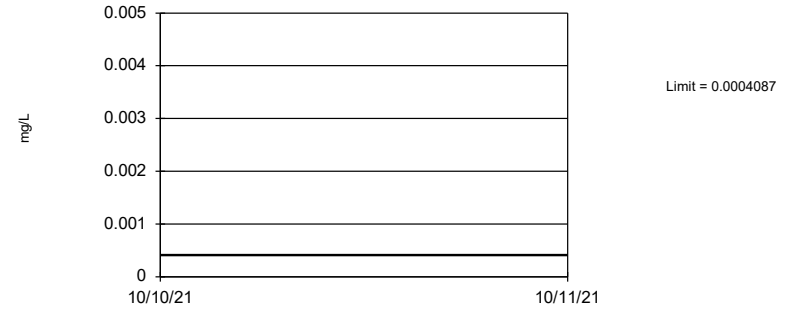
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.02529, Std. Dev.=0.009835, n=18, 27.78% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8665, critical = 0.858. Report alpha = 0.05.

Constituent: Molybdenum total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

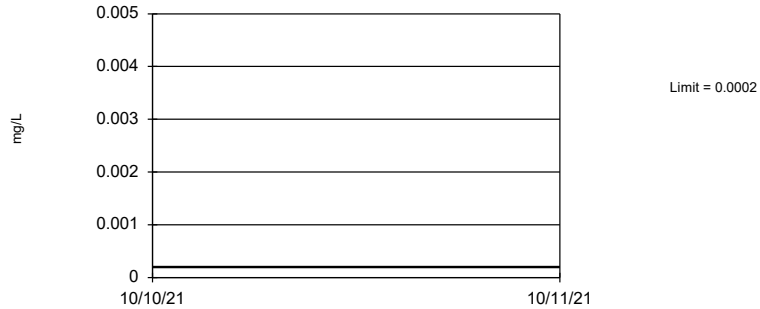
Tolerance Limit  
Interwell Parametric



95% coverage. Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.007751, Std. Dev.=0.005082, n=18, 22.22% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8839, critical = 0.858. Report alpha = 0.05.

Constituent: Selenium total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

Tolerance Limit  
Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Limit is highest of 18 background values. 72.22% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Constituent: Thallium total Analysis Run 1/24/2022 3:52 PM View: Rome Limestone - Pond 1 UTLs  
Clinch River LF Client: AEP Data: Clinch River

# Confidence Intervals - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:31 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig. 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	2.669	2.065	2	Yes 18	2.401	0.5604	0	None	ln(x)	0.01	Param.
Barium total (mg/L)	MW-1604	3.268	3.082	2	Yes 18	3.175	0.1544	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2014	0.1861	0.12	Yes 18	0.1938	0.01262	0	None	No	0.01	Param.

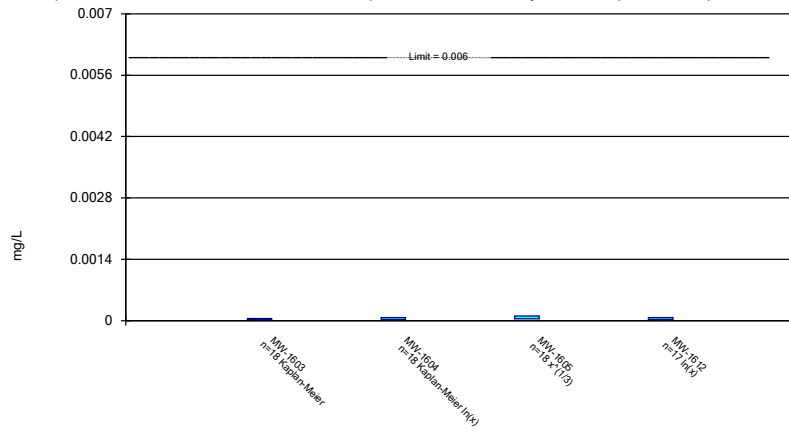
# Confidence Intervals - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:31 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	0.00004505	0.00002148	0.006	No 18	0.00004111	0.00002564	22.22	Kaplan-Meier	No	0.01	Param.
Antimony total (mg/L)	MW-1604	0.0000713	0.00002457	0.006	No 18	0.00007333	0.0000961	16.67	Kaplan-Meier	ln(x)	0.01	Param.
Antimony total (mg/L)	MW-1605	0.0001041	0.00004105	0.006	No 18	0.00008111	0.00006876	0	None	x^(1/3)	0.01	Param.
Antimony total (mg/L)	MW-1612	0.00007264	0.0000252	0.006	No 17	0.00006294	0.00007113	5.882	None	ln(x)	0.01	Param.
Arsenic total (mg/L)	MW-1603	0.002771	0.001991	0.026	No 18	0.002381	0.0006447	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1604	0.002567	0.001644	0.026	No 18	0.002146	0.000839	0	None	sqrt(x)	0.01	Param.
Arsenic total (mg/L)	MW-1605	0.004557	0.00263	0.026	No 18	0.003593	0.001593	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1612	0.001526	0.0005871	0.026	No 17	0.001172	0.000966	0	None	x^(1/3)	0.01	Param.
<b>Barium total (mg/L)</b>	<b>MW-1603</b>	<b>2.669</b>	<b>2.065</b>	<b>2</b>	<b>Yes 18</b>	<b>2.401</b>	<b>0.5604</b>	<b>0</b>	<b>None</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param.</b>
<b>Barium total (mg/L)</b>	<b>MW-1604</b>	<b>3.268</b>	<b>3.082</b>	<b>2</b>	<b>Yes 18</b>	<b>3.175</b>	<b>0.1544</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Barium total (mg/L)	MW-1605	1.73	1.25	2	No 18	1.506	0.4141	0	None	sqrt(x)	0.01	Param.
Barium total (mg/L)	MW-1612	2.321	1.99	2	No 17	2.155	0.2645	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1603	0.00005	0.00001	0.004	No 18	0.00004322	0.0000156	83.33	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1604	0.00005	0.000007	0.004	No 18	0.00004511	0.00001423	88.89	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1605	0.00005	0.00001	0.004	No 18	0.00004272	0.00001678	83.33	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1612	0.00005	0.000045	0.004	No 17	0.00004212	0.00001683	76.47	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1605	0.00002	0.00001	0.005	No 18	0.00001944	0.000002357	88.89	None	No	0.01	NP (NDs)
Chromium total (mg/L)	MW-1603	0.000234	0.000187	0.1	No 18	0.0002046	0.00005375	0	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1604	0.00024	0.0001506	0.1	No 18	0.0001953	0.00007385	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1605	0.0002857	0.0001824	0.1	No 18	0.0002341	0.00008541	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1612	0.000218	0.00018	0.1	No 17	0.0002032	0.00007624	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1603	0.0005722	0.0003053	0.006	No 18	0.0004388	0.0002205	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1604	0.000726	0.0004407	0.006	No 18	0.0005834	0.0002358	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1605	0.000354	0.00006	0.006	No 18	0.0002166	0.0001352	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1612	0.000232	0.0001338	0.006	No 17	0.0001876	0.00008197	0	None	sqrt(x)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1603	1.631	0.7828	5	No 18	1.207	0.7013	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1604	1.577	0.9294	5	No 18	1.253	0.5354	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1605	2.122	0.6629	5	No 18	1.574	1.417	0	None	No	0.01	NP (normality)
Combined Radium 226 and 228 (pCi/L)	MW-1612	2.256	1.269	5	No 17	1.763	0.7875	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1603	0.1433	0.1118	4	No 18	0.1283	0.02706	0	None	sqrt(x)	0.01	Param.
Fluoride total (mg/L)	MW-1604	0.2857	0.2288	4	No 18	0.2572	0.04701	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1605	0.3778	0.3388	4	No 18	0.3583	0.03222	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1612	0.1921	0.1468	4	No 17	0.1694	0.03614	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1603	0.0002	0.00002	0.015	No 18	0.0001392	0.00008866	66.67	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1604	0.0002	0.00002	0.015	No 18	0.0001353	0.00008473	61.11	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1605	0.0002	0.00004	0.015	No 18	0.0001159	0.00007839	44.44	None	No	0.01	NP (normality)
Lead total (mg/L)	MW-1612	0.000331	0.00004	0.015	No 17	0.0001534	0.00008861	58.82	None	No	0.01	NP (NDs)
Lithium total (mg/L)	MW-1603	0.0805	0.05691	0.12	No 18	0.06871	0.01949	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1604	0.08224	0.07348	0.12	No 18	0.07786	0.007241	0	None	No	0.01	Param.
<b>Lithium total (mg/L)</b>	<b>MW-1605</b>	<b>0.2014</b>	<b>0.1861</b>	<b>0.12</b>	<b>Yes 18</b>	<b>0.1938</b>	<b>0.01262</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Lithium total (mg/L)	MW-1612	0.1269	0.1083	0.12	No 17	0.1152	0.02105	5.882	None	x^3	0.01	Param.
Mercury total (mg/L)	MW-1603	0.001	0.00006	0.002	No 18	0.0009478	0.0002216	94.44	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1604	0.001	0.00006	0.002	No 18	0.0009478	0.0002216	94.44	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1612	0.001	0.00006	0.002	No 17	0.0009447	0.000228	94.12	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1603	0.00179	0.0005	0.1	No 18	0.001162	0.001094	0	None	No	0.01	NP (normality)
Molybdenum total (mg/L)	MW-1604	0.0007978	0.0002944	0.1	No 18	0.0007794	0.0004632	22.22	Kaplan-Meier	sqrt(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1605	0.00394	0.001276	0.1	No 18	0.002897	0.002478	0	None	sqrt(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1612	0.001321	0.0006262	0.1	No 17	0.001096	0.0008088	5.882	None	ln(x)	0.01	Param.
Selenium total (mg/L)	MW-1603	0.0001	0.00006	0.05	No 18	0.0001467	0.0001636	16.67	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1604	0.0005	0.00004	0.05	No 18	0.0002	0.0002185	33.33	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1605	0.0005	0.00005	0.05	No 18	0.0002783	0.0002283	50	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1612	0.0005	0.00003	0.05	No 17	0.0002594	0.0002344	47.06	None	No	0.01	NP (normality)
Thallium total (mg/L)	MW-1603	0.0002	0.00002	0.002	No 18	0.0001478	0.00008667	72.22	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1604	0.0002	0.00002	0.002	No 18	0.0001583	0.00008024	77.78	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1605	0.0002	0.00002	0.002	No 18	0.0001589	0.00007918	77.78	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1612	0.0002	0.00003	0.002	No 17	0.0001565	0.000081	76.47	None	No	0.01	NP (NDs)

### Parametric Confidence Interval

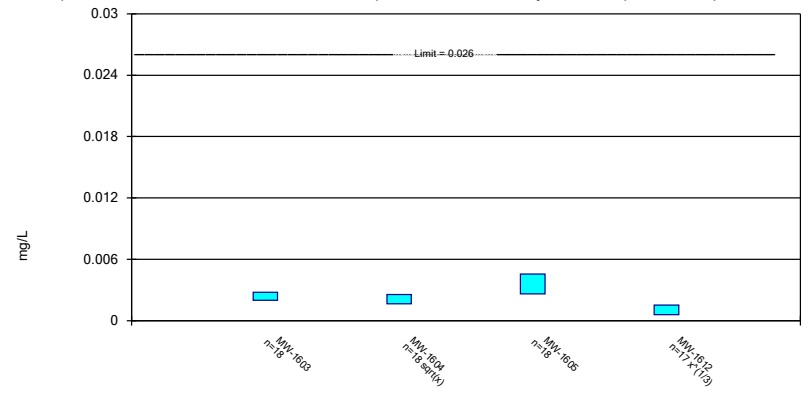
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

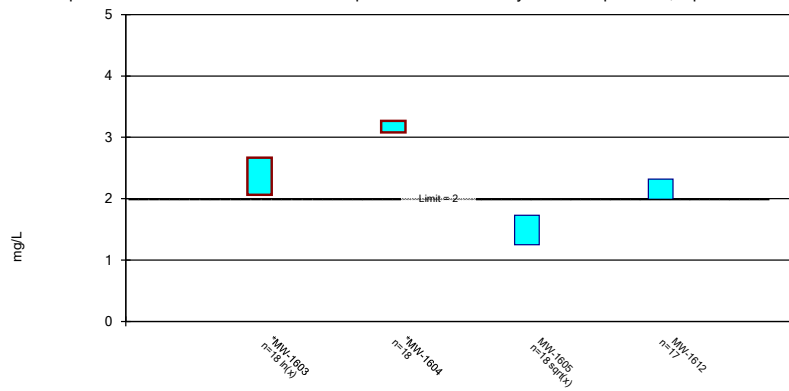
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

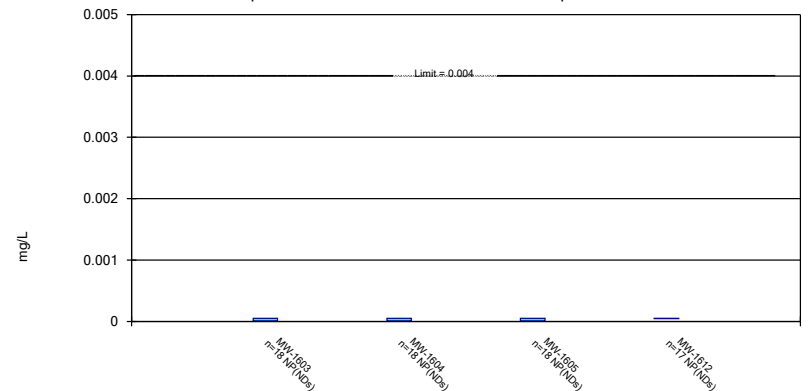
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

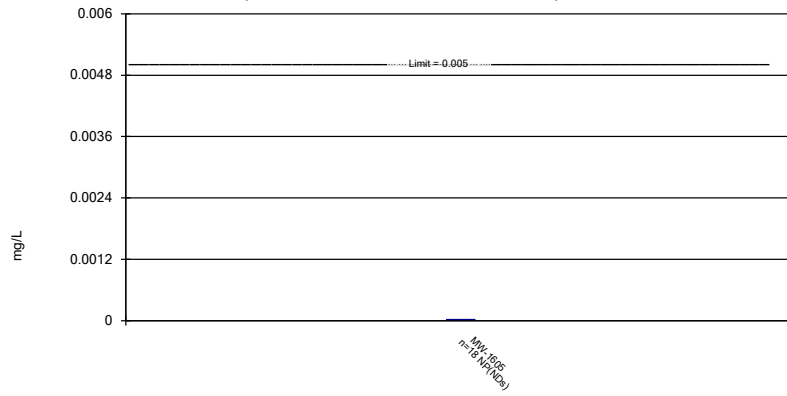
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

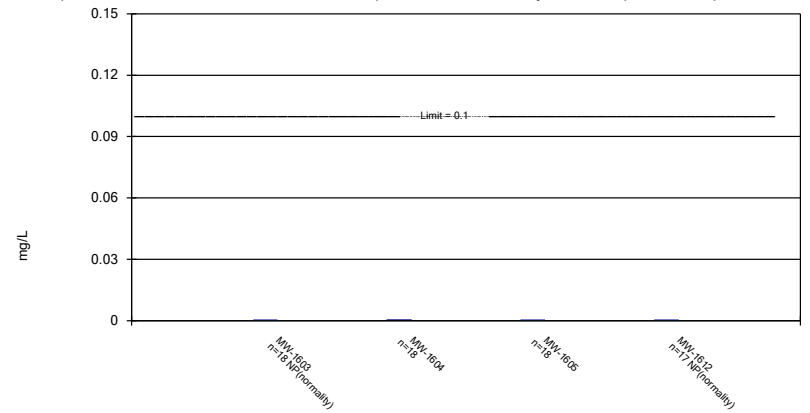
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

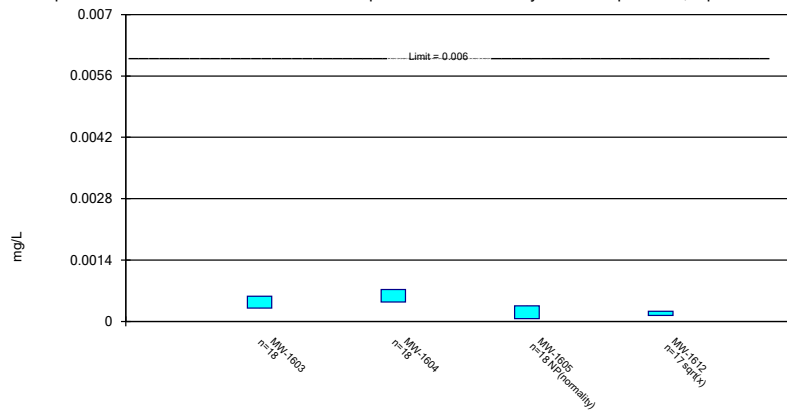
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

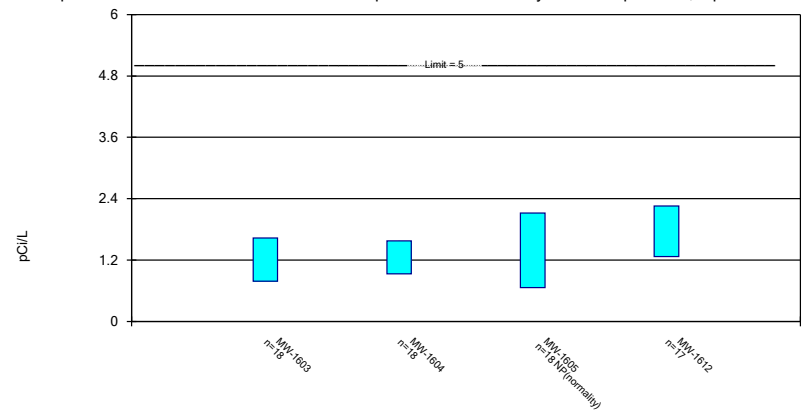
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

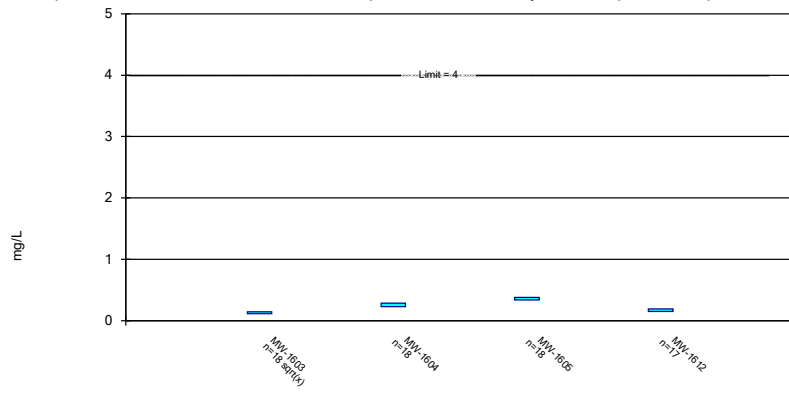
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

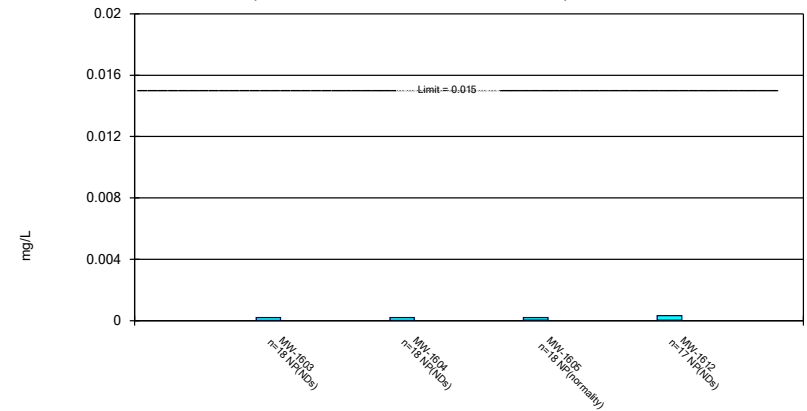
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

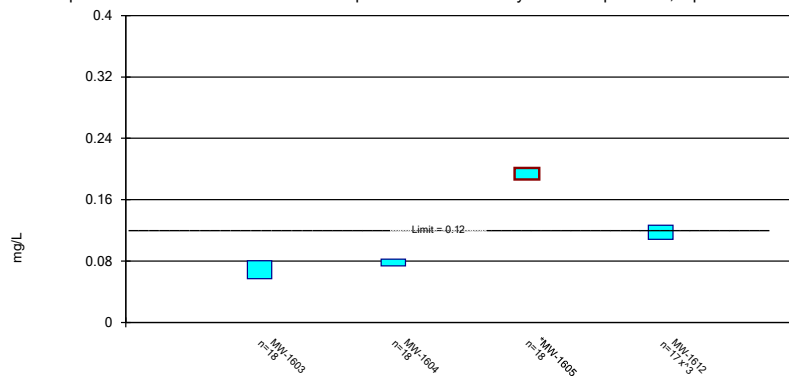
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence In  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

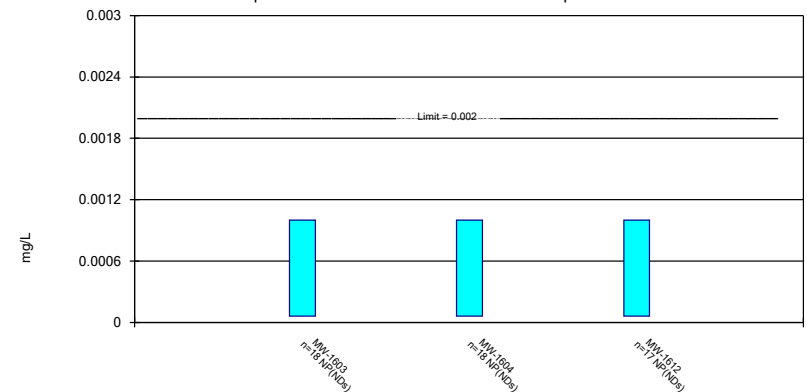
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

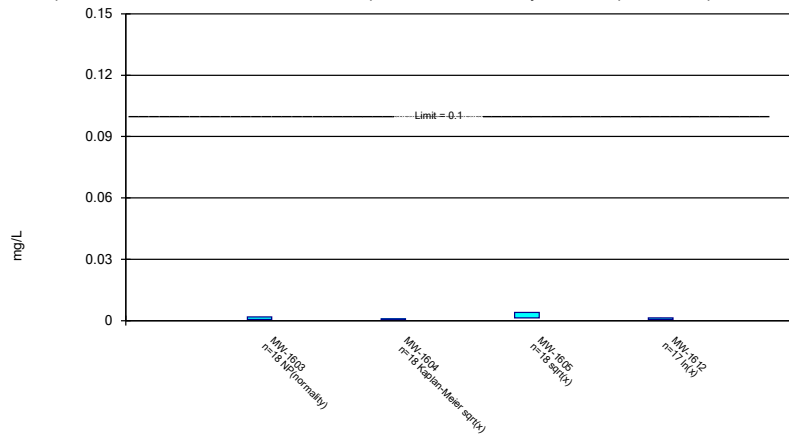
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

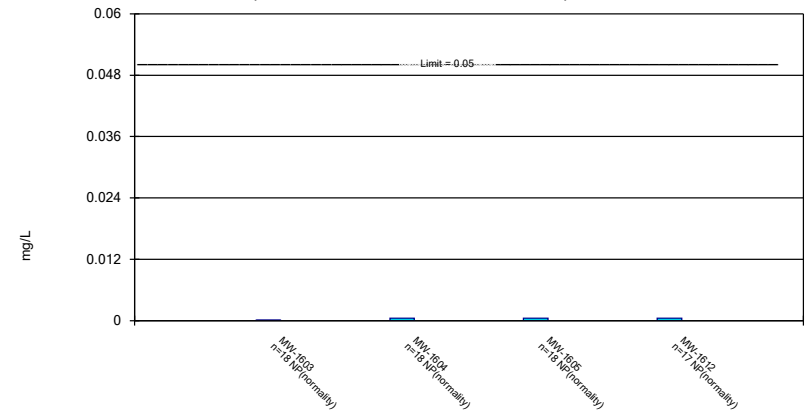
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confid  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

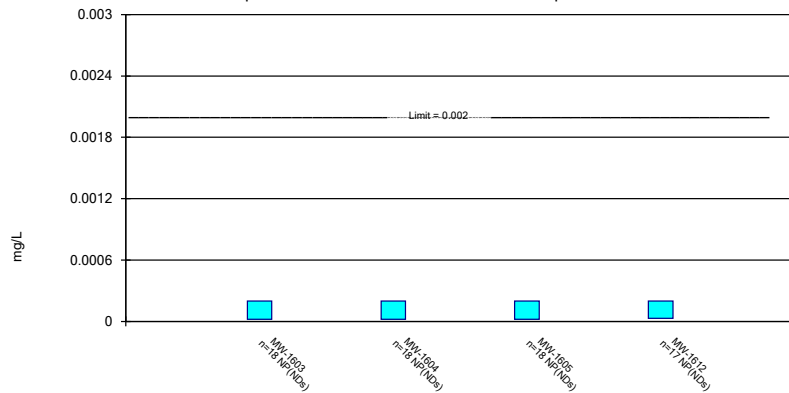
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium total Analysis Run 1/24/2022 3:28 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 1/24/2022 3:28 PM View: Chattanooga Shale - Pond 1 Confidenc  
Clinch River LF Client: AEP Data: Clinch River

# Confidence Intervals - Dumps Fault - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:47 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt total (mg/L)	MW-1610	0.009433	0.006549	0.006	Yes 18	0.007991	0.002384	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1610	0.215	0.171	0.16	Yes 18	0.1948	0.04492	0	None	No	0.01	NP (normality)
Molybdenum total (mg/L)	MW-1610	0.182	0.135	0.1	Yes 18	0.1629	0.05141	0	None	No	0.01	NP (normality)



# Confidence Intervals - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:47 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	0.0002416	0.00004722	0.006	No 18	0.0002767	0.0004561	5.556	None	ln(x)	0.01	Param.
Arsenic total (mg/L)	MW-1610	0.00167	0.00124	0.046	No 18	0.001694	0.001094	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1610	0.2539	0.2069	2	No 18	0.2304	0.03888	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1610	0.00005	0.000007	0.004	No 18	0.00003994	0.00001937	77.78	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1610	0.00003	0.00001	0.005	No 18	0.00001983	0.00001428	38.89	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1610	0.000267	0.000192	0.1	No 18	0.0002644	0.0001523	0	None	No	0.01	NP (normality)
<b>Cobalt total (mg/L)</b>	<b>MW-1610</b>	<b>0.009433</b>	<b>0.006549</b>	<b>0.006</b>	<b>Yes 18</b>	<b>0.007991</b>	<b>0.002384</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Combined Radium 226 and 228 (pCi/L)	MW-1610	1.328	0.7045	5	No 18	1.016	0.515	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1610	0.22	0.18	4	No 18	0.2122	0.04292	0	None	No	0.01	NP (normality)
Lead total (mg/L)	MW-1610	0.009372	0.00384	0.015	No 18	0.006606	0.004572	0	None	No	0.01	Param.
<b>Lithium total (mg/L)</b>	<b>MW-1610</b>	<b>0.215</b>	<b>0.171</b>	<b>0.16</b>	<b>Yes 18</b>	<b>0.1948</b>	<b>0.04492</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>NP (normality)</b>
Mercury total (mg/L)	MW-1610	0.001	0.00006	0.002	No 18	0.0009478	0.0002216	94.44	None	No	0.01	NP (NDs)
<b>Molybdenum total (mg/L)</b>	<b>MW-1610</b>	<b>0.182</b>	<b>0.135</b>	<b>0.1</b>	<b>Yes 18</b>	<b>0.1629</b>	<b>0.05141</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>NP (normality)</b>
Selenium total (mg/L)	MW-1610	0.0003718	0.0002059	0.05	No 18	0.0002889	0.0001371	0	None	No	0.01	Param.
Thallium total (mg/L)	MW-1610	0.0002	0.00002	0.002	No 18	0.00014	0.00008738	66.67	None	No	0.01	NP (NDs)

### Parametric Confidence Interval

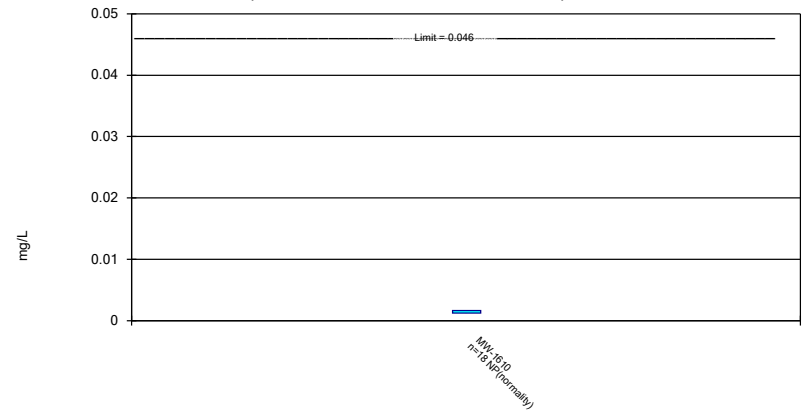
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Inte  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

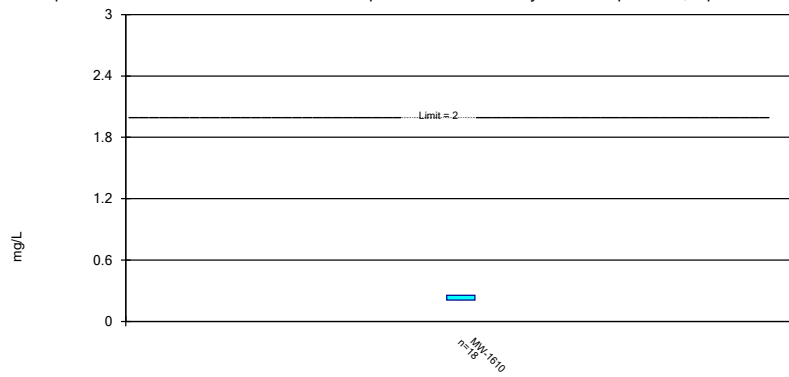
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

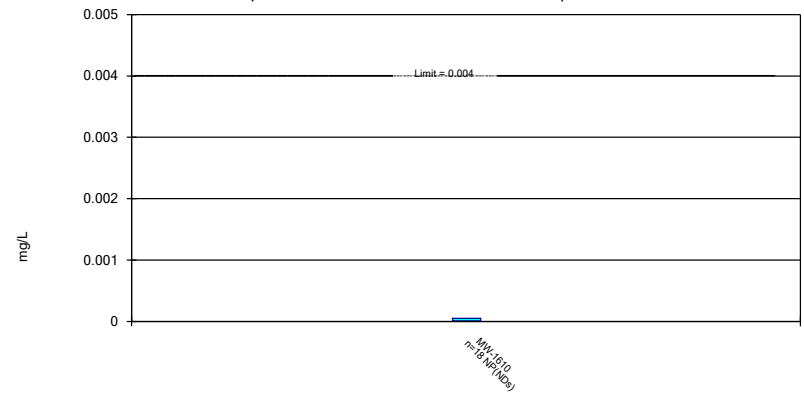
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

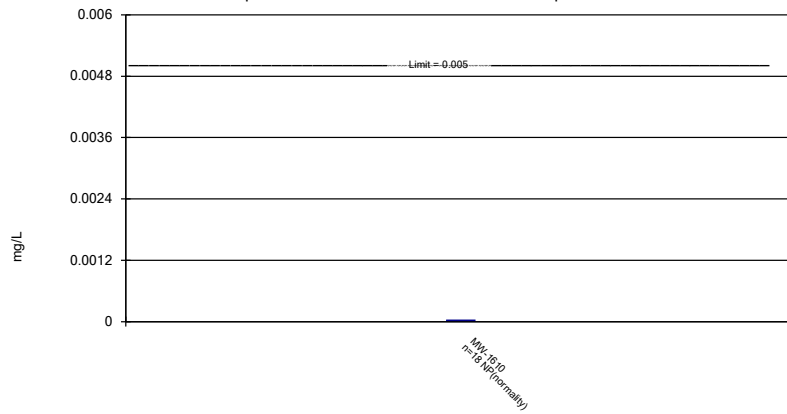
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Inte  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

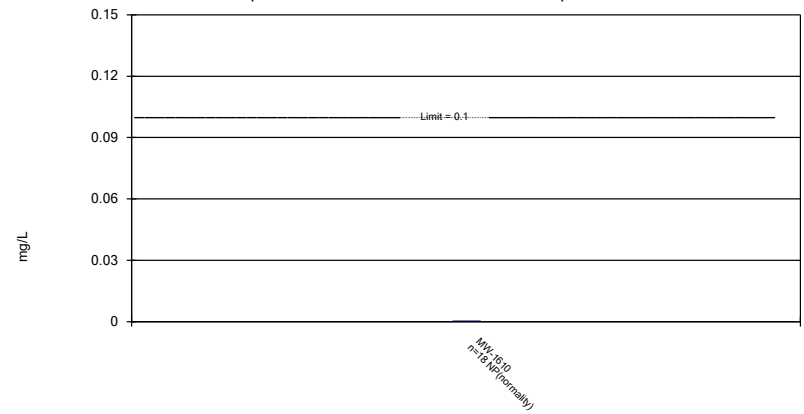
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Int  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

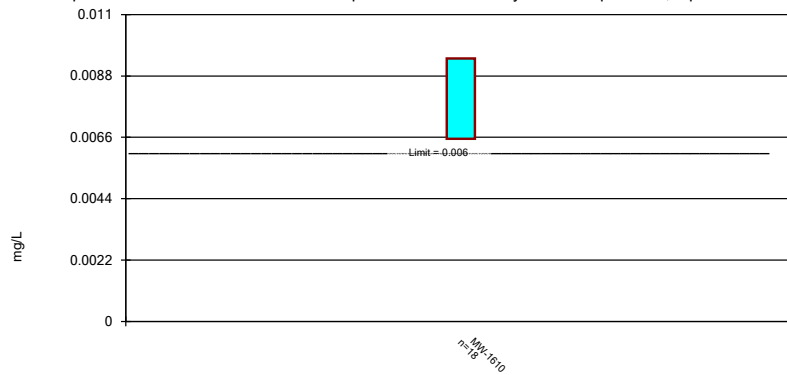
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Chromium total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Int  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

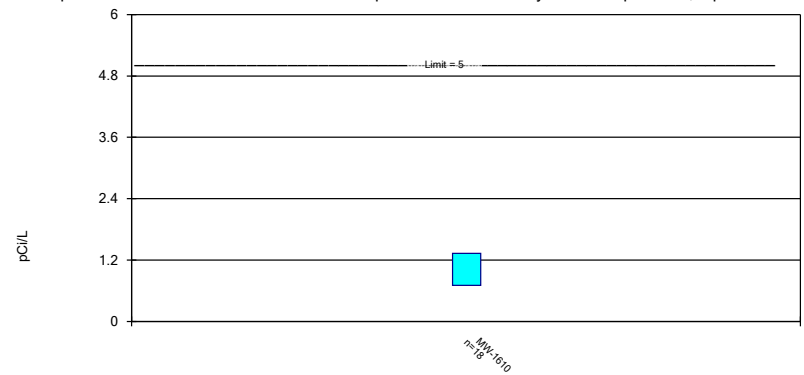
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Int  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

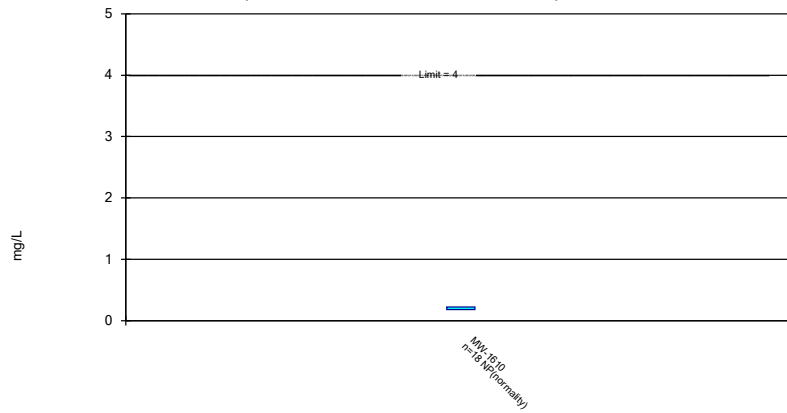
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

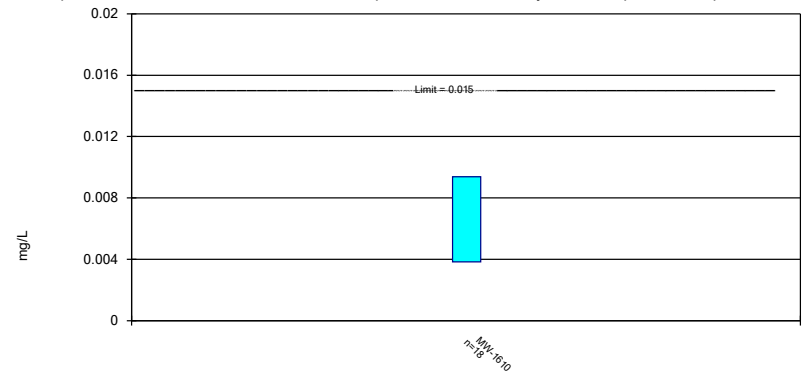
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

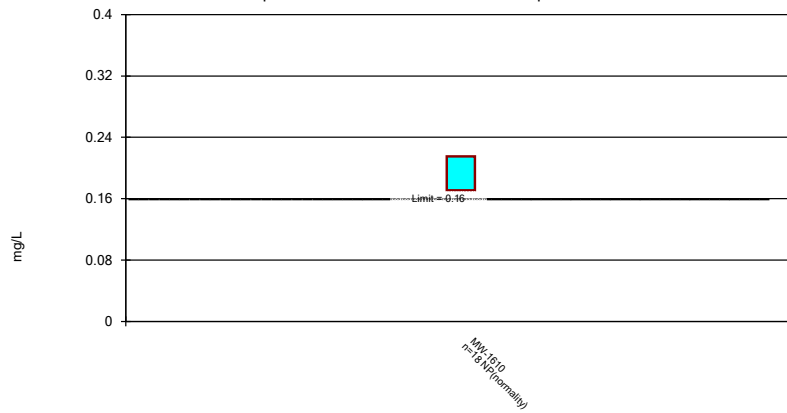
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Intervals  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

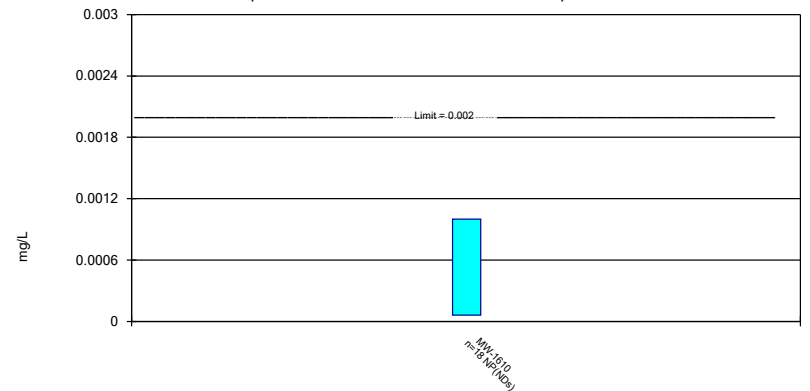
Compliance limit is exceeded. Per-well alpha = 0.01.



Constituent: Lithium total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

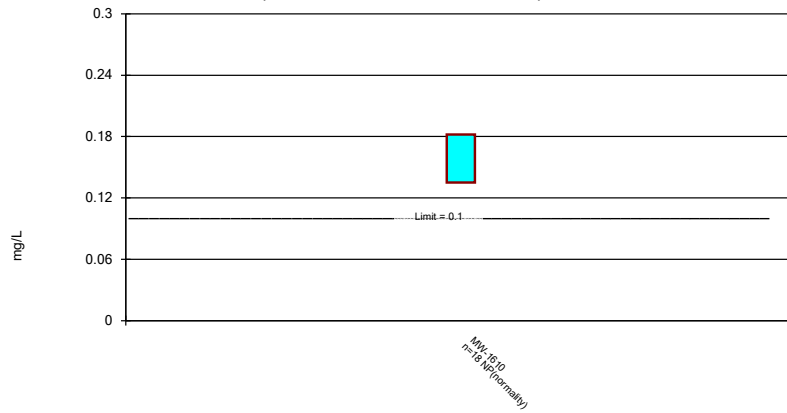
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

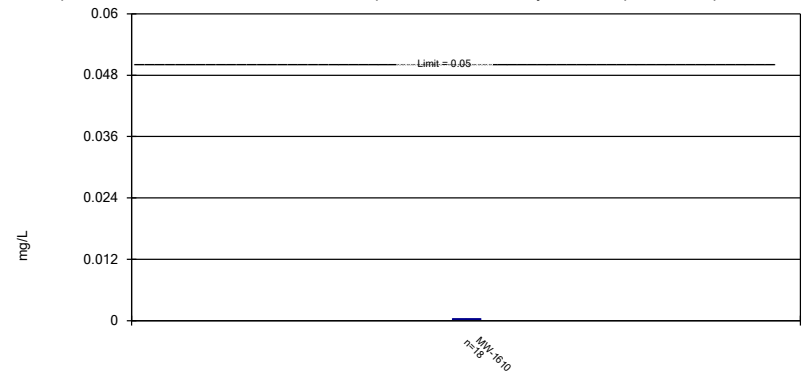
Compliance limit is exceeded. Per-well alpha = 0.01.



Constituent: Molybdenum total Analysis Run 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

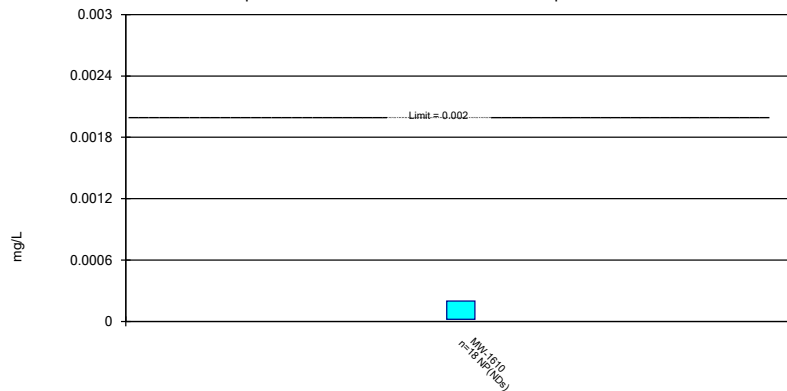
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 1/24/2022 3:46 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 1/24/2022 3:46 PM View: Dumps Fault - Pond 1 Confidence Inter  
Clinch River LF Client: AEP Data: Clinch River

# Confidence Intervals - Rome Limestone - Significant Results

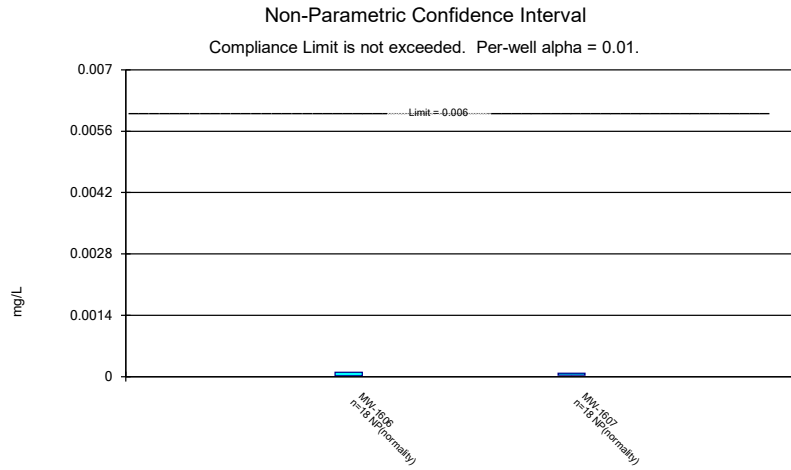
Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 4:13 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig. N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt total (mg/L)	MW-1607	0.01076	0.008089	0.006	Yes 18	0.009423	0.002205	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.08598	0.05532	0.04	Yes 18	0.07065	0.02535	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.1282	0.1171	0.04	Yes 18	0.1227	0.009152	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1555	0.1306	0.1	Yes 18	0.143	0.02064	0	None	No	0.01	Param.

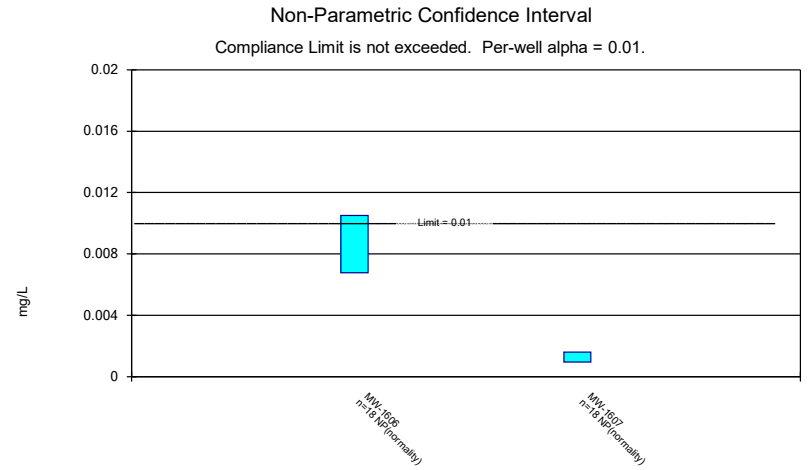
# Confidence Intervals - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 4:13 PM

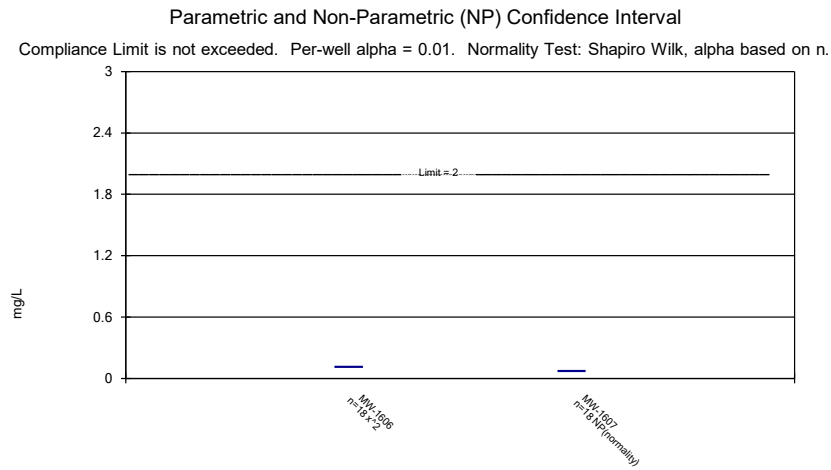
Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1606	0.0001	0.00002	0.006	No	18	0.00005222	0.00003541	33.33	None	No	0.01	NP (normality)
Antimony total (mg/L)	MW-1607	0.00008	0.00003	0.006	No	18	0.00005056	0.00002235	5.556	None	No	0.01	NP (normality)
Arsenic total (mg/L)	MW-1606	0.0105	0.00677	0.01	No	18	0.008228	0.002567	0	None	No	0.01	NP (normality)
Arsenic total (mg/L)	MW-1607	0.00159	0.00096	0.01	No	18	0.001566	0.001221	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1606	0.119	0.1075	2	No	18	0.113	0.01013	0	None	x^2	0.01	Param.
Barium total (mg/L)	MW-1607	0.0753	0.0685	2	No	18	0.07619	0.01726	0	None	No	0.01	NP (normality)
Beryllium total (mg/L)	MW-1606	0.00005	0.000007	0.004	No	18	0.00003383	0.00002106	61.11	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1607	0.00005	0.000005	0.004	No	18	0.0000475	0.00001061	94.44	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1606	0.00002	0.00001	0.005	No	18	0.00001489	0.000008976	44.44	None	No	0.01	NP (normality)
Cadmium total (mg/L)	MW-1607	0.0001685	0.0001009	0.005	No	18	0.0001347	0.00005587	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1606	0.000234	0.00014	0.1	No	18	0.00024	0.0001189	0	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1607	0.000216	0.0001	0.1	No	18	0.0002186	0.0001654	5.556	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1606	0.005594	0.004356	0.006	No	18	0.004975	0.001023	0	None	No	0.01	Param.
<b>Cobalt total (mg/L)</b>	<b>MW-1607</b>	<b>0.01076</b>	<b>0.008089</b>	<b>0.006</b>	<b>Yes</b>	<b>18</b>	<b>0.009423</b>	<b>0.002205</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Combined Radium 226 and 228 (pCi/L)	MW-1606	2.29	1.224	5.19	No	18	1.932	1.264	0	None	ln(x)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1607	1.296	0.6625	5.19	No	18	1.021	0.5827	0	None	sqrt(x)	0.01	Param.
Fluoride total (mg/L)	MW-1606	0.2298	0.1813	4	No	18	0.2056	0.04003	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1607	0.2425	0.213	4	No	18	0.2278	0.02439	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1606	0.0006595	0.0003811	0.015	No	18	0.0005203	0.0002301	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1607	0.0005998	0.0003941	0.015	No	18	0.0004969	0.0001701	0	None	No	0.01	Param.
<b>Lithium total (mg/L)</b>	<b>MW-1606</b>	<b>0.08598</b>	<b>0.05532</b>	<b>0.04</b>	<b>Yes</b>	<b>18</b>	<b>0.07065</b>	<b>0.02535</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
<b>Lithium total (mg/L)</b>	<b>MW-1607</b>	<b>0.1282</b>	<b>0.1171</b>	<b>0.04</b>	<b>Yes</b>	<b>18</b>	<b>0.1227</b>	<b>0.009152</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Mercury total (mg/L)	MW-1606	0.001	0.00006	0.002	No	18	0.0009478	0.0002216	94.44	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1607	0.001	0.00008	0.002	No	18	0.0009489	0.0002168	94.44	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1606	0.07643	0.05307	0.1	No	18	0.06475	0.01931	0	None	No	0.01	Param.
<b>Molybdenum total (mg/L)</b>	<b>MW-1607</b>	<b>0.1555</b>	<b>0.1306</b>	<b>0.1</b>	<b>Yes</b>	<b>18</b>	<b>0.143</b>	<b>0.02064</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Selenium total (mg/L)	MW-1606	0.0001288	0.00006908	0.05	No	18	0.0001078	0.00006283	11.11	None	ln(x)	0.01	Param.
Selenium total (mg/L)	MW-1607	0.0002282	0.0001025	0.05	No	18	0.0001911	0.0001543	0	None	ln(x)	0.01	Param.
Thallium total (mg/L)	MW-1606	0.0002	0.00005	0.002	No	18	0.0001422	0.00007566	61.11	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1607	0.0002	0.00003	0.002	No	18	0.0001378	0.00008236	61.11	None	No	0.01	NP (NDs)



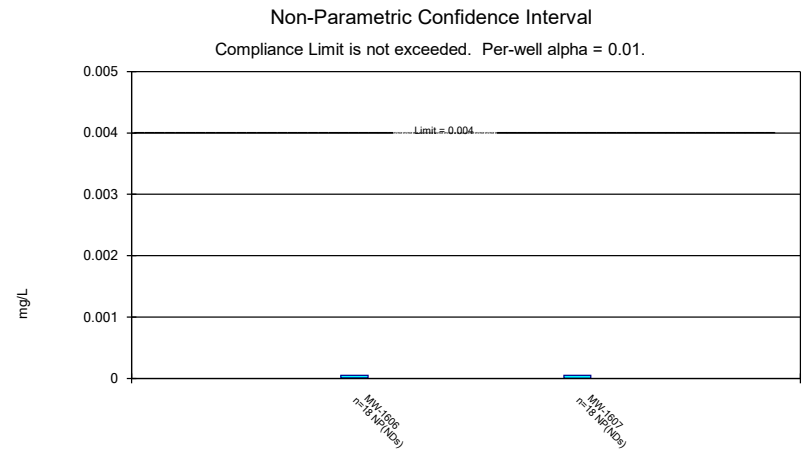
Constituent: Antimony total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River



Constituent: Arsenic total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence In  
Clinch River LF Client: AEP Data: Clinch River



Constituent: Barium total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence In  
Clinch River LF Client: AEP Data: Clinch River

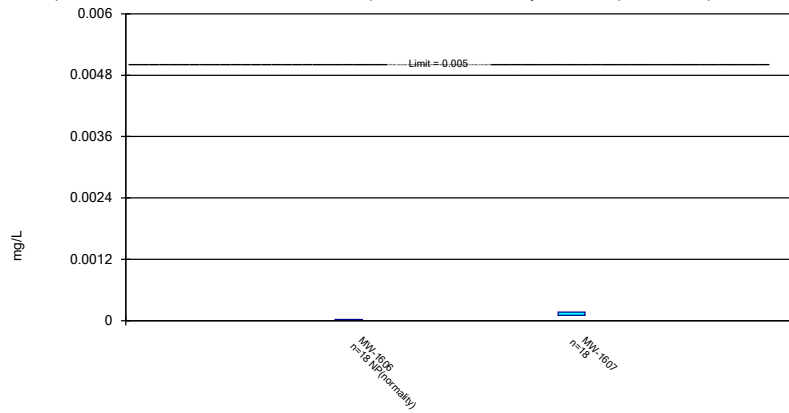


Constituent: Beryllium total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River



### Parametric and Non-Parametric (NP) Confidence Interval

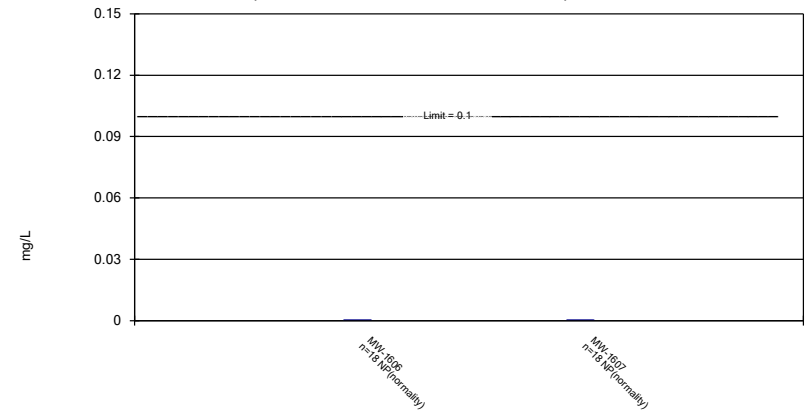
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

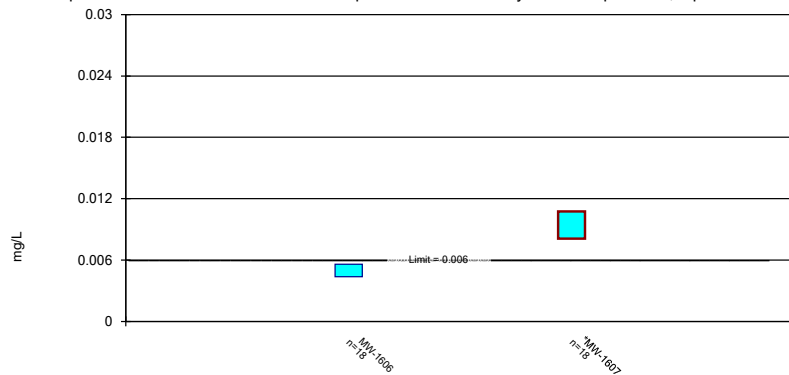
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Chromium total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

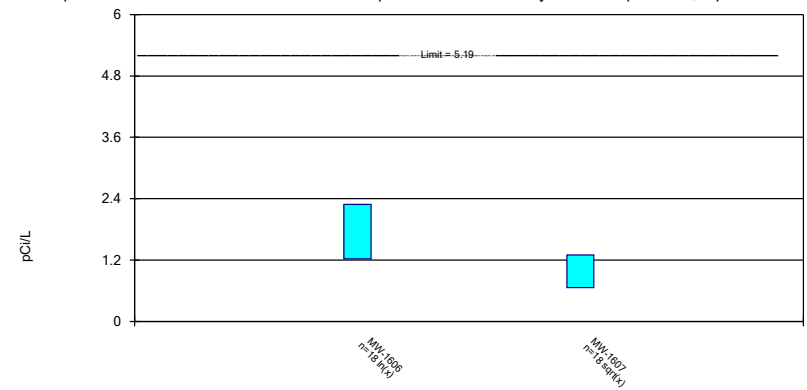
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence Int Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

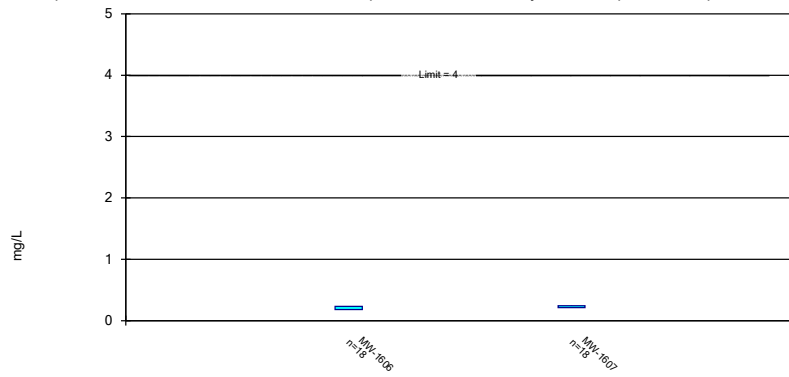
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - P Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

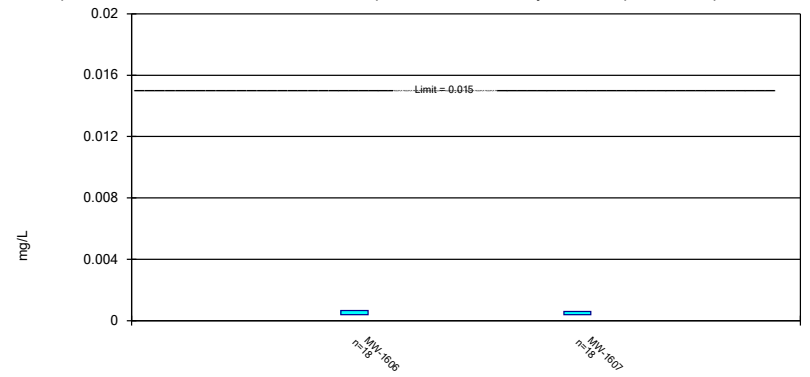
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

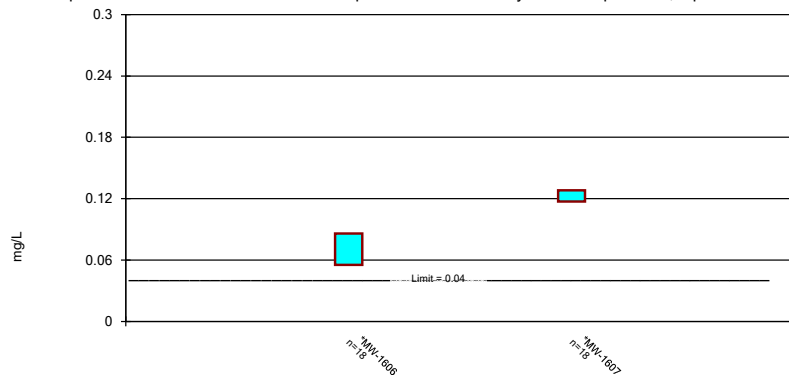
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence Inter  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

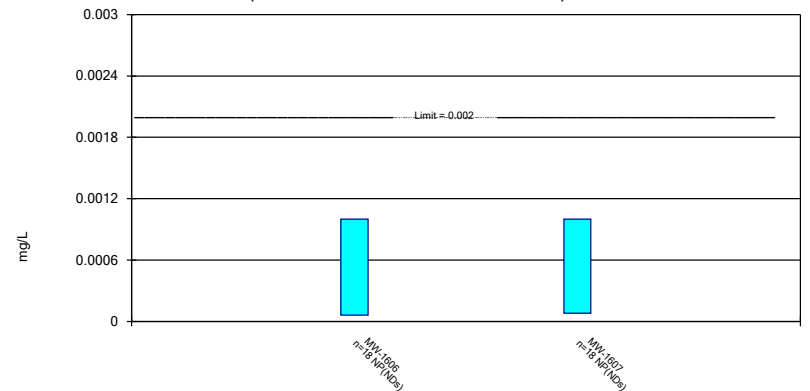
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence In  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

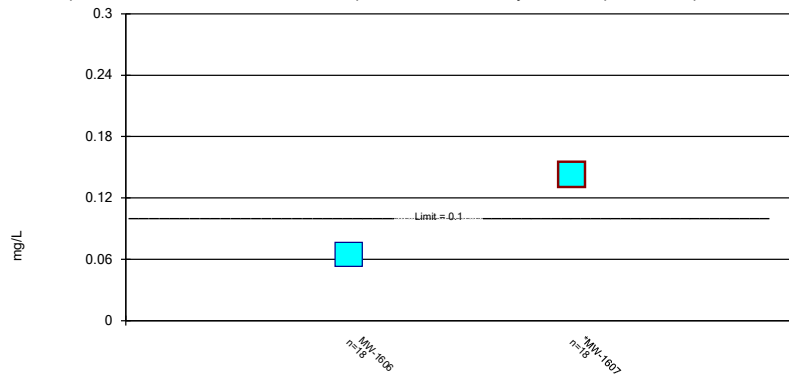
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

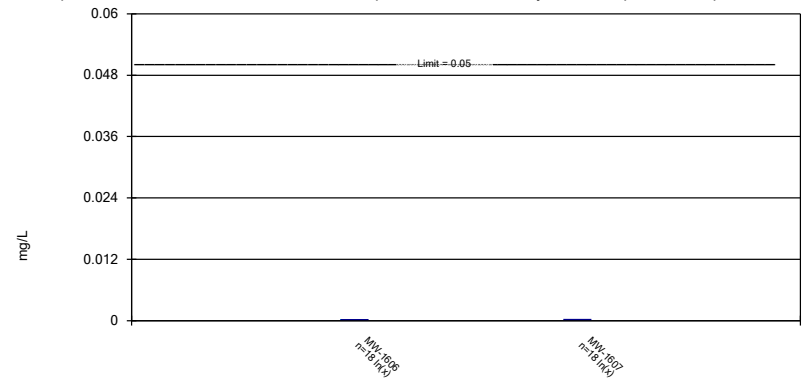
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

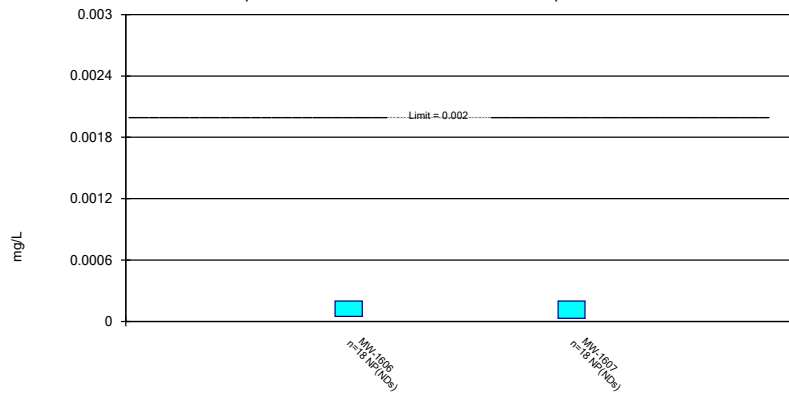
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 1/24/2022 4:12 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 1/24/2022 4:12 PM View: Rome Limestone - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River

**STATISTICAL ANALYSIS SUMMARY**  
**ASH POND 1**  
**Clinch River Plant**  
**Carbo, Virginia**

*Submitted to*



1 Riverside Plaza  
Columbus, Ohio 43215-2372

*Submitted by*



engineers | scientists | innovators

500 West Wilson Bridge Road  
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August 15, 2022

CHA8500

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## LIST OF TABLES

Table 1	Groundwater Data Summary
Table 2	Appendix IV Groundwater Protection Standards
Table 3	Appendix IV Identified Statistically Significant Levels
Table 4	Appendix III Data Summary

## LIST OF ATTACHMENTS

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

## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Verification
CFR	Code of Federal Regulations
GWPS	Groundwater Protection Standard
LCL	Lower Confidence Limit
LFB	Laboratory Fortified Blanks
LRB	Laboratory Reagent Blanks
MCL	Maximum Contaminant Level
NELAP	National Environmental Laboratory Accreditation Program
QA	Quality Assurance
QC	Quality Control
SSD	Statistically Significant Decrease
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
UTL	Upper Tolerance Limit

## SECTION 1

### EXECUTIVE SUMMARY

In accordance with the United States Environmental Protection Agency's (USEPA's) regulations regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (40 CFR 257 Subpart D, "CCR rule"), groundwater monitoring has been conducted at Ash Pond 1, an existing CCR unit at the Clinch River Plant located in Carbo, Virginia. Recent groundwater monitoring results were compared to the 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. SSIs for calcium, chloride, sulfate, and pH and SSLs for barium, cobalt, lithium, and molybdenum were identified, and an alternative source for these exceedances were not identified. Therefore, Ash Pond 1 initiated an assessment of corrective measures in accordance with 40 CFR 257.96 and has been completing assessment monitoring since.

During 2022, an annual sampling event for Appendix III and Appendix IV parameters required by 257.95(b) was completed in February, and a semi-annual sampling event for Appendix III and Appendix IV parameters required by 257.95(d)(1) was completed in April. The results of these annual and semi-annual assessment monitoring events are documented in this report.

Monitoring data from the February 2022 and April 2022 events 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 which 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. 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. Thus, 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.

## SECTION 2

### ASH POND 1 EVALUATION

#### 2.1 Data Validation & 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 2022) and 257.95(d)(1) (April 2022). The geological units consist of 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 an analytical laboratory certified by the National Environmental Laboratory Accreditation Program (NELAP). Quality assurance and quality control (QA/QC) samples completed by the analytical laboratory included the use of laboratory reagent blanks (LRBs), continuing calibration verification (CCV) 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.9.6.35 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 February and April 2022 were screened for potential outliers. No outliers were identified for these events.

##### 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, non-parametric confidence limits were calculated in some cases (e.g., when the data did not appear to be normally distributed or when the non-detect 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). Calculated confidence limits are shown in Attachment B. The calculated confidence limits were compared to the GWPSs provided in Table 2. The GWPSs were established during a



previous statistical analysis as either the greater value of the background concentration or the maximum contaminant level (MCL) and risk-based level specified in 40 CFR 257.95(h)(2) (Geosyntec, 2022).

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

- The LCL for barium at MW-1603 (2.14 mg/L), MW-1604 (3.10 mg/L), and MW-1612 (2.03 mg/L) exceeded the GWPS of 2.00 mg/L, and the LCL for lithium at MW-1605 (0.188 mg/L) exceeded the GWPS of 0.118 mg/L in the Chattanooga Shale formation.
- The LCLs for lithium at MW-1606 (0.0583 mg/L) and MW-1607 (0.118 mg/L) exceeded the GWPS of 0.0400 mg/L, the LCL for cobalt at MW-1607 (0.00830 mg/L) exceeded the GWPS of 0.00600 mg/L, , and the LCL for molybdenum at MW-1607 (0.131 mg/L) exceeded the GWPS of 0.100 mg/L in the Rome Limestone formation.
- The LCL for cobalt at MW-1610 (0.00637 mg/L) exceeded the GWPS of 0.00600 mg/L and the LCL for molybdenum at MW-1610 (0.122 mg/L) exceeded the GWPS of 0.100 mg/L in the Dumps Fault water-bearing unit.

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).

### **2.2.2 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 exceeded background concentrations. Data collected during the April 2022 assessment monitoring event from downgradient compliance wells were compared to previously calculated 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 upper prediction limits (UPLs) were noted:

- Calcium concentrations exceeded the Chattanooga Shale interwell UPL of 7.25 mg/L at MW-1603 (26.9 mg/L), MW-1604 (26.5 mg/L), MW-1605 (48.2 mg/L), and MW-1612 (49.9 mg/L).
- Chloride concentrations exceeded the Chattanooga Shale interwell UPL of 45.8 mg/L at MW-1603 (109 mg/L) and MW-1605 (154 mg/L). Chloride concentrations exceeded the Rome Limestone interwell UPL of 4.10 mg/L at MW-1606 (12.8 mg/L) and MW-1607 (6.20 mg/L).
- Sulfate concentrations exceeded the Rome Limestone interwell UPL of 20.9 mg/L at MW-1606 (44.3 mg/L) and MW-1607 (134 mg/L).

Additionally, the following statistically significant decreases (SSDs) below the lower prediction limits (LPLs) for pH were noted:

- pH values were below the Chattanooga Shale interwell LPL of 8.0 SU for MW-1603 (7.3 SU), MW-1604 (6.8 SU), MW-1605 (7.4 SU), and MW-1612 (6.7 SU).

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

### **2.3 Conclusions**

An annual and a semi-annual assessment monitoring events were 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. A review of outliers identified no potential outliers in the February 2022 or April 2022 data. A confidence interval was constructed at each compliance well for each Appendix IV parameter; SSLs were concluded if the entire confidence interval exceeded the GWPS. SSLs were identified for barium, cobalt, lithium, and molybdenum.

Appendix III parameters were compared to previously calculated prediction limits. Calcium, chloride, and sulfate results exceeded 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.

### **SECTION 3**

#### **REFERENCES**

Geosyntec Consultants (Geosyntec). 2020. Statistical Analysis Plan. October 2020.

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

# TABLES

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

Parameter	Unit	MW-1601		MW-1602		MW-1603		MW-1604		MW-1605		MW-1606	
		2/22/2022	4/12/2022	2/22/2022	4/12/2022	2/23/2022	4/13/2022	2/23/2022	4/13/2022	2/23/2022	4/13/2022	2/22/2022	4/13/2022
Antimony	µg/L	0.02 J1	0.02 J1	0.14	0.13	0.09 J1	0.09 J1	0.12	0.04 J1	0.1 U1	0.1 U1	0.1 U1	0.1 U1
Arsenic	µg/L	5.93	4.69	1.63	1.27	2.84	2.62	4.49	2.82	0.97	1.24	7.01	7.19
Barium	µg/L	171	134	97.2	97.3	3,190	2,750	3,230	3,280	2,400	2,330	108	111
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	0.05 U1	0.009 J1	0.008 J1
Boron	mg/L	0.531	0.549	0.590	0.629	0.279	0.244	0.413	0.439	0.552	0.571	0.130	0.137
Cadmium	µg/L	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	0.02 U1	0.018 J1	0.009 J1
Calcium	mg/L	5.14 M1	4.72	3.25	3.22	27.5	26.9	25.6	26.5	45.4	48.2	57.0	56.3
Chloride	mg/L	24.6	16.8	4.94	3.54	169	109	16.9	16.2	157	154	13.6	12.8
Chromium	µg/L	0.15 J1	0.07 J1	0.12 J1	0.2 U1	0.12 J1	0.10 J1	0.13 J1	0.04 J1	0.26	0.06 J1	0.16 J1	0.15 J1
Cobalt	µg/L	0.058	0.052	0.018 J1	0.018 J1	0.167 B1	0.203	0.186 B1	0.190	0.045 B1	0.037	3.64	3.90
Combined Radium	pCi/L	1.03	0.79	1	0.72	1.97	0.68	1.47	1.23	1.35	1.47	2.07	1.62
Fluoride	mg/L	2.29	2.37	1.73	1.74	0.11	0.1	0.30	0.28	0.32	0.31	0.19	0.19
Lead	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	0.44	0.52
Lithium	mg/L	0.108 M1, P3	0.0897	0.0367	0.0375	0.0777	0.0617	0.0860	0.0754	0.205	0.201	0.0822	0.0915
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	0.9	0.8	1	1	0.4 J1	0.4 J1	0.3 J1	0.2 J1	0.8	0.6	58.2	67.7
Selenium	µg/L	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.1 J1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.5 U1	0.1 J1
Sulfate	mg/L	302	154	25.1	15.2	0.80	0.75	0.29 J1	0.13 J1	0.4 U1	0.4 U1	46.4	44.3
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	1,580	1,340	530	510	640	490	420	390	670	640	350	330
pH	SU	8.79	8.16	8.76	8.12	7.54	7.25	7.63	6.84	8.05	7.39	7.36	6.85

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J: Estimated value. Parameter was detected in concentrations below 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.

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

-: Not sampled

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

Parameter	Unit	MW-1607		MW-1608		MW-1609		MW-1610		MW-1611		MW-1612	
		2/23/2022	4/12/2022	2/22/2022	4/12/2022	2/22/2022	4/12/2022	2/23/2022	4/13/2022	2/22/2022	4/12/2022	2/23/2022	4/13/2022
Antimony	µg/L	0.02 J1	0.03 J1	0.1 U1	0.02 J1	0.02 J1	0.02 J1	0.06 J1	0.46	0.1 U1	0.1 U1	0.2 U1	0.1 U1
Arsenic	µg/L	1.11	1.16	0.97	0.73	0.08 J1	0.06 J1	1.14	1.67	6.04	5.82	0.38	0.31
Barium	µg/L	64.3	65.0	26.5	24.8	366	410	303	345	218	213	2,440	2,550
Beryllium	µg/L	0.05 U1	0.05 U1	0.05 U1	0.008 J1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1	0.05 U1
Boron	mg/L	0.109	0.113	0.351	0.361	0.05 U1	0.010 J1	0.028 J1	0.030 J1	0.535	0.546	0.371	0.394
Cadmium	µg/L	0.113	0.098	0.02 U1	0.02 U1	0.011 J1	0.011 J1	0.008 J1	0.006 J1	0.02 U1	0.02 U1	0.02 U1	0.02 U1
Calcium	mg/L	43.6 M1, P3	44.7	0.78	0.59	65.3	72.7	33.6	36.2	18.8	20.6	42.8	49.9
Chloride	mg/L	6.82	6.20	5.89	4.37	1.36	0.97	9.99	9.37	13.7	13.3	22.7	15.2
Chromium	µg/L	0.07 J1	0.2 U1	0.20	0.20	0.07 J1	0.2 U1	0.14 J1	0.12 J1	0.14 J1	0.05 J1	0.15 J1	0.10 J1
Cobalt	µg/L	10.6 B1	9.76	0.109	0.126	0.022	0.005 J1	5.94 B1	4.81	0.013 J1	0.011 J1	0.091 B1	0.115
Combined Radium	pCi/L	1.01	1.4	1.09	0.7	2.14	1.36	1.49	0.83	0.72	0.66	1.62	1.75
Fluoride	mg/L	0.20	0.20	0.43	0.40	0.24	0.23	0.19	0.18	1.15	1.11	0.15	0.13
Lead	µg/L	0.53	0.50	0.07 J1	0.11 J1	0.15 J1	0.19 J1	1.11	1.65	0.2 U1	0.2 U1	0.2 U1	0.2 U1
Lithium	mg/L	0.134	0.128	0.0193	0.0192	0.00093	0.00097	0.146	0.132	0.0622	0.0639	0.129	0.131
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	137 M1	129	1.2	1.0	0.3 J1	0.3 J1	75.8	85.6	1.5	1.5	0.3 J1	0.1 J1
Selenium	µg/L	0.5 U1	0.19 J1	0.5 U1	0.5 U1	0.5 U1	0.17 J1	0.5 U1	0.22 J1	0.5 U1	0.5 U1	0.5 U1	0.5 U1
Sulfate	mg/L	137	134	172	159	18.4	16.9	13.4	14.7	45.1	42.9	0.4 U1	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	270	280	440	410	290	290	230	230	540	540	520	520
pH	SU	8.18	7.38	8.63	8.1	7.82	7.1	7.96	7.2	8.16	7.48	7.63	6.67

Notes:

µg/L: micrograms per liter

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. For statistical analysis, parameters which were not detected were replaced with the reporting limit.

J: Estimated value. Parameter was detected in concentrations below 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.

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

-: Not sampled

**Table 2A: Appendix IV Groundwater Protection Standards  
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		0.000386	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		0.00122	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.000416	0.00600
Combined Radium, Total (pCi/L)	5.00		2.75	5.00
Fluoride, Total (mg/L)	4.00		2.42	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000562	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	0.0153	0.100
Selenium, Total (mg/L)	0.0500		0.000500	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value

MCL = Maximum Contaminant Level

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  
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		0.000117	0.00600
Arsenic, Total (mg/L)	0.0100		0.000970	0.0100
Barium, Total (mg/L)	2.00		0.526	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		0.000336	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.00132	0.00600
Combined Radium, Total (pCi/L)	5.00		5.19	5.19
Fluoride, Total (mg/L)	4.00		0.348	4.00
Lead, Total (mg/L)	n/a	0.0150	0.00130	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	0.00244	0.100
Selenium, Total (mg/L)	0.0500		0.000409	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value

MCL = Maximum Contaminant Level

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  
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		0.00112	0.00600
Arsenic, Total (mg/L)	0.0100		0.0457	0.0457
Barium, Total (mg/L)	2.00		0.201	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		0.000963	0.0500
Cobalt, Total (mg/L)	n/a	0.00600	0.000144	0.00600
Combined Radium, Total (pCi/L)	5.00		1.94	5.00
Fluoride, Total (mg/L)	4.00		1.36	4.00
Lead, Total (mg/L)	n/a	0.0150	0.000212	0.0150
Lithium, Total (mg/L)	n/a	0.0400	0.165	0.165
Mercury, Total (mg/L)	0.00200		0.00100	0.00200
Molybdenum, Total (mg/L)	n/a	0.100	0.00613	0.100
Selenium, Total (mg/L)	0.0500		0.000307	0.0500
Thallium, Total (mg/L)	0.00200		0.000200	0.00200

Notes:

Grey cell indicates calculated UTL is higher than MCL or CCR Rule-specified value

MCL = Maximum Contaminant Level

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  
Clinch River Plant - Ash Pond 1**

<b>Formation</b>	<b>Well ID</b>	<b>Constituent</b>	<b>GWPS</b>	<b>LCL</b>
Chattanooga Shale	MW-1603	Barium	2.00	2.14
	MW-1604	Barium	2.00	3.10
	MW-1605	Lithium	0.118	0.188
	MW-1612	Barium	2.00	2.03
Rome Limestone	MW-1606	Lithium	0.0400	0.0583
	MW-1607	Cobalt	0.00600	0.00830
		Lithium	0.0400	0.118
		Molybdenum	0.100	0.131
Dumps Fault	MW-1610	Cobalt	0.00600	0.00637
		Molybdenum	0.100	0.122

Notes:

All values are in mg/L

GWPS - Groundwater protection standard

LCL - lower confidence limit

**Table 4A: Appendix III Data Summary  
Clinch River Plant - Pond 1**

Analyte	Unit	Description	Chattanooga Shale			
			MW-1603 4/13/2022	MW-1604 4/13/2022	MW-1605 4/13/2022	MW-1612 4/13/2022
Boron	mg/L	Intrawell Background Value (UPL)	0.489	0.501	0.673	0.590
		Analytical Result	0.244	0.439	0.571	0.394
Calcium	mg/L	Interwell Background Value (UPL)	7.25			
		Analytical Result	<b>26.9</b>	<b>26.5</b>	<b>48.2</b>	<b>49.9</b>
Chloride	mg/L	Interwell Background Value (UPL)	45.8			
		Analytical Result	<b>109</b>	16.2	<b>154</b>	15.2
Fluoride	mg/L	Intrawell Background Value (UPL)	0.185	0.288	0.428	0.255
		Analytical Result	0.1	0.28	0.31	0.13
pH	SU	Interwell Background Value (UPL)	9.0			
		Interwell Background Value (LPL)	8.0			
		Analytical Result	<b>7.3</b>	<b>6.8</b>	<b>7.4</b>	<b>6.7</b>
Sulfate	mg/L	Intrawell Background Value (UPL)	31.5	4.87	133	18.1
		Analytical Result	0.75	0.13	0.06	0.06
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	682	417	902	577
		Analytical Result	490	390	640	520

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

**Table 4B: Appendix III Data Summary  
Clinch River Plant - Pond 1**

Analyte	Unit	Description	Rome Limestone	
			MW-1606	MW-1607
			4/13/2022	4/12/2022
Boron	mg/L	Intrawell Background Value (UPL)	0.206	0.185
		Analytical Result	0.137	0.113
Calcium	mg/L	Intrawell Background Value (UPL)	65.8	53.1
		Analytical Result	56.3	44.7
Chloride	mg/L	Interwell Background Value (UPL)	4.10	
		Analytical Result	<b>12.8</b>	<b>6.20</b>
Fluoride	mg/L	Intrawell Background Value (UPL)	0.289	0.272
		Analytical Result	0.19	0.20
pH	SU	Intrawell Background Value (UPL)	7.5	8.3
		Intrawell Background Value (LPL)	6.7	7.2
		Analytical Result	6.9	7.4
Sulfate	mg/L	Interwell Background Value (UPL)	20.9	
		Analytical Result	<b>44.3</b>	<b>134</b>
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	384	316
		Analytical Result	330	280

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

**Table 4C: Appendix III Data Summary  
Clinch River Plant - Pond 1**

Analyte	Unit	Description	Dumps Fault
			MW-1610
			4/13/2022
Boron	mg/L	Intrawell Background Value (UPL)	0.117
		Analytical Result	0.030
Calcium	mg/L	Intrawell Background Value (UPL)	38.7
		Analytical Result	36.2
Chloride	mg/L	Intrawell Background Value (UPL)	12.5
		Analytical Result	9.37
Fluoride	mg/L	Intrawell Background Value (UPL)	0.225
		Analytical Result	0.18
pH	SU	Intrawell Background Value (UPL)	8.0
		Intrawell Background Value (LPL)	7.1
		Analytical Result	7.2
Sulfate	mg/L	Intrawell Background Value (UPL)	51.8
		Analytical Result	14.7
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	267
		Analytical Result	230

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

# ATTACHMENT A

Certification by Qualified Professional Engineer



**Certification by Qualified Professional Engineer**

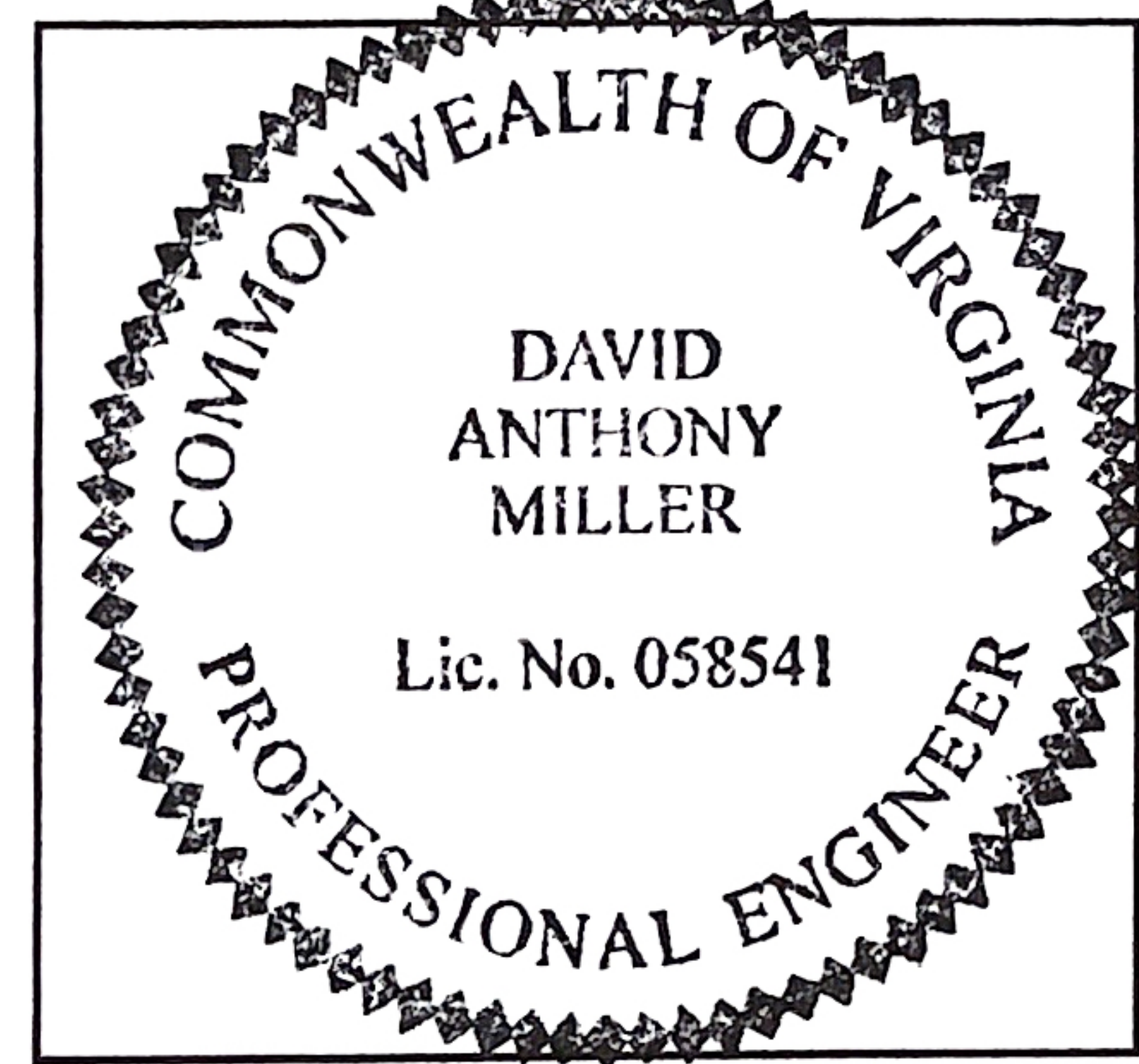
I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Clinch River Ash Pond 1 CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



058541

License Number

VIRGINIA

Licensing State

08.15.22

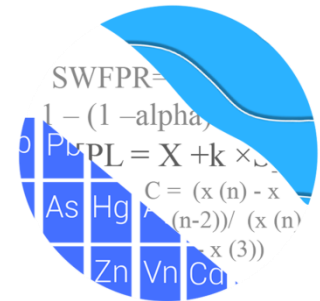
Date



**ATTACHMENT B**  
**Statistical Analysis Output**



## GROUNDWATER STATS CONSULTING



August 9, 2022

Geosyntec Consultants  
Attn: Ms. Allison Kreinberg  
941 Chatham Lane, #103  
Worthington, OH 43221

RE: Clinch River Pond 1 – Assessment Monitoring Report – February/April 2022

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 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 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 with 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 in background, 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 2022**

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 April 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. No new suspected outliers were identified during this analysis and no changes were made to previous flagged values. 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 2021 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. During this analysis, the background limit for lithium was reported to three significant figures where applicable, as requested by Geosyntec Consultants.

### 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 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 2022 (Figures F). 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
- Molybdenum: 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: Chattanooga Shale

Analysis Run 7/21/2022 3:02 PM View: Chattanooga Shale - Pond 1 Confidence Intervals  
Clinch River LF Client: AEP Data: Clinch River

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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 LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:49 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>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)	n/a	0.0003862	n/a	n/a	n/a	54	-9.447	0.7777	1.852	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.0258	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Barium total (mg/L)	n/a	0.306	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Beryllium total (mg/L)	n/a	0.000066	n/a	n/a	n/a	54	n/a	n/a	61.11	n/a	n/a	0.06267	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00003	n/a	n/a	n/a	54	n/a	n/a	85.19	n/a	n/a	0.06267	NP Inter(NDs)
Chromium total (mg/L)	n/a	0.001218	n/a	n/a	n/a	54	-8.094	0.6772	0	None	ln(x)	0.05	Inter
Cobalt total (mg/L)	n/a	0.0004159	n/a	n/a	n/a	54	0.04677	0.01365	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	2.746	n/a	n/a	n/a	54	0.8862	0.2518	0	None	x^(1/3)	0.05	Inter
Fluoride total (mg/L)	n/a	2.42	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Lead total (mg/L)	n/a	0.0005623	n/a	n/a	n/a	54	0.04698	0.01741	18.52	Kaplan-Meier	x^(1/3)	0.05	Inter
Lithium total (mg/L)	n/a	0.118	n/a	n/a	n/a	54	n/a	n/a	1.852	n/a	n/a	0.06267	NP Inter(normality)
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	54	n/a	n/a	87.04	n/a	n/a	0.06267	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.01532	n/a	n/a	n/a	54	-5.853	0.8202	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0005	n/a	n/a	n/a	54	n/a	n/a	40.74	n/a	n/a	0.06267	NP Inter(normality)
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	54	n/a	n/a	74.07	n/a	n/a	0.06267	NP Inter(NDs)

# Tolerance Limits Summary Table - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:53 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	n/a	0.0001174	n/a	n/a	n/a	18	0.005925	0.002001	11.11	None	sqrt(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.00097	n/a	n/a	n/a	18	n/a	n/a	0	n/a	n/a	0.3972	NP Inter(normality)
Barium total (mg/L)	n/a	0.5258	n/a	n/a	n/a	18	0.3964	0.05273	0	None	No	0.05	Inter
Beryllium total (mg/L)	n/a	0.00005	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00004	n/a	n/a	n/a	18	n/a	n/a	22.22	n/a	n/a	0.3972	NP Inter(normality)
Chromium total (mg/L)	n/a	0.0003363	n/a	n/a	n/a	18	0.0001676	0.00006878	0	None	No	0.05	Inter
Cobalt total (mg/L)	n/a	0.001322	n/a	n/a	n/a	18	0.01437	0.008965	16.67	Kaplan-Meier	sqrt(x)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	5.185	n/a	n/a	n/a	18	1.394	0.3598	0	None	sqrt(x)	0.05	Inter
Fluoride total (mg/L)	n/a	0.3478	n/a	n/a	n/a	18	0.2572	0.03691	0	None	No	0.05	Inter
Lead total (mg/L)	n/a	0.001297	n/a	n/a	n/a	18	0.02016	0.006466	0	None	sqrt(x)	0.05	Inter
Lithium total (mg/L)	n/a	0.01	n/a	n/a	n/a	18	n/a	n/a	33.33	n/a	n/a	0.3972	NP Inter(normality)
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.002442	n/a	n/a	n/a	18	0.02529	0.009835	27.78	Kaplan-Meier	sqrt(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0004087	n/a	n/a	n/a	18	0.007751	0.005082	22.22	Kaplan-Meier	sqrt(x)	0.05	Inter
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	18	n/a	n/a	72.22	n/a	n/a	0.3972	NP Inter(NDs)



# Tolerance Limits Summary Table - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:42 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	n/a	0.001115	n/a	n/a	n/a	18	-9.523	1.11	0	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.04569	n/a	n/a	n/a	18	0.2341	0.05031	0	None	x^(1/3)	0.05	Inter
Barium total (mg/L)	n/a	0.2008	n/a	n/a	n/a	18	0.09569	0.04287	0	None	No	0.05	Inter
Beryllium total (mg/L)	n/a	0.00005	n/a	n/a	n/a	18	n/a	n/a	72.22	n/a	n/a	0.3972	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00002	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Chromium total (mg/L)	n/a	0.0009625	n/a	n/a	n/a	18	0.000422	0.0002203	0	None	No	0.05	Inter
Cobalt total (mg/L)	n/a	0.0001438	n/a	n/a	n/a	17	0.00005629	0.00003521	0	None	No	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	1.935	n/a	n/a	n/a	18	n/a	n/a	0	n/a	n/a	0.3972	NP Inter(normality)
Fluoride total (mg/L)	n/a	1.356	n/a	n/a	n/a	18	0.9283	0.1742	0	None	No	0.05	Inter
Lead total (mg/L)	n/a	0.0002117	n/a	n/a	n/a	17	0.00009664	0.00004628	29.41	Kaplan-Meier	No	0.05	Inter
Lithium total (mg/L)	n/a	0.1649	n/a	n/a	n/a	18	0.2912	0.04683	0	None	sqrt(x)	0.05	Inter
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.006125	n/a	n/a	n/a	17	-6.077	0.395	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0003072	n/a	n/a	n/a	18	-9.559	0.5999	11.11	None	ln(x)	0.05	Inter
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	18	n/a	n/a	83.33	n/a	n/a	0.3972	NP Inter(NDs)

# Confidence Intervals - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 8:11 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	2.778	2.138	2	Yes	20	2.458	0.5628	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.267	3.099	2	Yes	20	3.183	0.1484	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.35	2.032	2	Yes	19	2.191	0.272	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2017	0.1877	0.118	Yes	20	0.1947	0.01229	0	None	No	0.01	Param.

# Confidence Intervals - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 8:11 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	0.00004897	0.00002323	0.006	No	20	0.000064	0.00002854	20	Kaplan-Meier	No	0.01	Param.
Antimony total (mg/L)	MW-1604	0.0001087	0.00004463	0.006	No	20	0.0000875	0.00008777	15	None	x^(1/3)	0.01	Param.
Antimony total (mg/L)	MW-1605	0.0001075	0.00004593	0.006	No	20	0.000083	0.0000653	10	None	sqrt(x)	0.01	Param.
Antimony total (mg/L)	MW-1612	0.00006096	0.00002333	0.006	No	19	0.00007158	0.00006702	15.79	Kaplan-Meier	ln(x)	0.01	Param.
Arsenic total (mg/L)	MW-1603	0.002768	0.002064	0.026	No	20	0.002416	0.0006203	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1604	0.002741	0.001742	0.026	No	20	0.002297	0.0009587	0	None	sqrt(x)	0.01	Param.
Arsenic total (mg/L)	MW-1605	0.004305	0.002384	0.026	No	20	0.003345	0.001691	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1612	0.001258	0.0005311	0.026	No	19	0.001085	0.0009474	0	None	ln(x)	0.01	Param.
<b>Barium total (mg/L)</b>	<b>MW-1603</b>	<b>2.778</b>	<b>2.138</b>	<b>2</b>	<b>Yes</b>	<b>20</b>	<b>2.458</b>	<b>0.5628</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
<b>Barium total (mg/L)</b>	<b>MW-1604</b>	<b>3.267</b>	<b>3.099</b>	<b>2</b>	<b>Yes</b>	<b>20</b>	<b>3.183</b>	<b>0.1484</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Barium total (mg/L)	MW-1605	1.86	1.323	2	No	20	1.592	0.4728	0	None	No	0.01	Param.
<b>Barium total (mg/L)</b>	<b>MW-1612</b>	<b>2.35</b>	<b>2.032</b>	<b>2</b>	<b>Yes</b>	<b>19</b>	<b>2.191</b>	<b>0.272</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Beryllium total (mg/L)	MW-1603	0.00005	0.00001	0.004	No	20	0.0000439	0.0000149	85	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1604	0.00005	0.000007	0.004	No	20	0.0000456	0.00001355	90	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1605	0.00005	0.00001	0.004	No	20	0.00004345	0.00001603	85	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1612	0.00005	0.000045	0.004	No	19	0.00004295	0.00001606	78.95	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1605	0.00002	0.00001	0.005	No	20	0.0000195	0.00002236	90	None	No	0.01	NP (NDs)
Chromium total (mg/L)	MW-1603	0.0002285	0.0001618	0.1	No	20	0.0001952	0.00005868	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1604	0.0002291	0.0001394	0.1	No	20	0.0001843	0.00007902	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1605	0.0002778	0.0001755	0.1	No	20	0.0002267	0.00008999	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1612	0.000218	0.00015	0.1	No	19	0.000195	0.00007645	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1603	0.0005399	0.0002869	0.006	No	20	0.0004134	0.0002228	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1604	0.0006881	0.0003996	0.006	No	20	0.0005439	0.0002541	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1605	0.0002779	0.0001202	0.006	No	20	0.0001991	0.0001388	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1612	0.0002158	0.0001275	0.006	No	19	0.0001787	0.00008185	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1603	1.614	0.8234	5	No	20	1.219	0.6965	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1604	1.552	0.9741	5	No	20	1.263	0.5088	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1605	1.713	0.868	5	No	20	1.558	1.341	0	None	No	0.01	NP (normality)
Combined Radium 226 and 228 (pCi/L)	MW-1612	2.19	1.319	5	No	19	1.754	0.7432	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1603	0.1397	0.1107	4	No	20	0.126	0.02664	0	None	sqrt(x)	0.01	Param.
Fluoride total (mg/L)	MW-1604	0.2865	0.2345	4	No	20	0.2605	0.04571	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1605	0.3729	0.3351	4	No	20	0.354	0.03331	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1612	0.1871	0.1455	4	No	19	0.1663	0.03547	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1603	0.0002	0.000021	0.015	No	20	0.0001453	0.00008593	70	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1604	0.0002	0.000047	0.015	No	20	0.0001417	0.00008258	65	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1605	0.0002	0.00005	0.015	No	20	0.0001243	0.00007853	50	None	No	0.01	NP (normality)
Lead total (mg/L)	MW-1612	0.0002	0.00004	0.015	No	19	0.0001583	0.00008483	63.16	None	No	0.01	NP (NDs)
Lithium total (mg/L)	MW-1603	0.07938	0.05823	0.118	No	20	0.06881	0.01862	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1604	0.08219	0.0741	0.118	No	20	0.07815	0.007115	0	None	No	0.01	Param.
<b>Lithium total (mg/L)</b>	<b>MW-1605</b>	<b>0.2017</b>	<b>0.1877</b>	<b>0.118</b>	<b>Yes</b>	<b>20</b>	<b>0.1947</b>	<b>0.01229</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Lithium total (mg/L)	MW-1612	0.1274	0.1107	0.118	No	19	0.1168	0.02039	5.263	None	x^3	0.01	Param.
Mercury total (mg/L)	MW-1603	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1604	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1612	0.001	0.00006	0.002	No	19	0.0009505	0.0002157	94.74	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1603	0.00151	0.0005	0.1	No	20	0.001086	0.001061	0	None	No	0.01	NP (normality)
Molybdenum total (mg/L)	MW-1604	0.0008433	0.0002932	0.1	No	20	0.0007265	0.0004677	20	Kaplan-Meier	No	0.01	Param.
Molybdenum total (mg/L)	MW-1605	0.003555	0.001176	0.1	No	20	0.002678	0.00244	0	None	sqrt(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1612	0.001318	0.0005281	0.1	No	19	0.001002	0.0008139	5.263	None	sqrt(x)	0.01	Param.
Selenium total (mg/L)	MW-1603	0.0001	0.00007	0.05	No	20	0.000162	0.0001743	20	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1604	0.0005	0.00005	0.05	No	20	0.00023	0.0002264	40	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1605	0.0005	0.00005	0.05	No	20	0.0003005	0.0002264	55	None	No	0.01	NP (NDs)
Selenium total (mg/L)	MW-1612	0.0005	0.00004	0.05	No	19	0.0002847	0.0002336	52.63	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1603	0.0002	0.00002	0.002	No	20	0.000153	0.00008355	75	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1604	0.0002	0.00002	0.002	No	20	0.0001625	0.00007697	80	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1605	0.0002	0.00002	0.002	No	20	0.000163	0.00007596	80	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1612	0.0002	0.00003	0.002	No	19	0.0001611	0.0000776	78.95	None	No	0.01	NP (NDs)

# Confidence Intervals - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 7/21/2022, 3:23 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-1607	0.01069	0.008304	0.006	Yes	20	0.009499	0.002103	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.0862	0.05834	0.04	Yes	20	0.07227	0.02453	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.1287	0.1183	0.04	Yes	20	0.1235	0.009082	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1533	0.1308	0.1	Yes	20	0.142	0.01981	0	None	No	0.01	Param.

# Confidence Intervals - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 7/21/2022, 3:23 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	20	0.000057	0.00003658	40	None	No	0.01	NP (normality)
Antimony total (mg/L)	MW-1607	0.00005832	0.00003472	0.006	No	20	0.000048	0.00002262	5	None	sqrt(x)	0.01	Param.
Arsenic total (mg/L)	MW-1606	0.00837	0.00689	0.01	No	20	0.008116	0.002453	0	None	No	0.01	NP (normality)
Arsenic total (mg/L)	MW-1607	0.00146	0.00098	0.01	No	20	0.001523	0.001163	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1606	0.1181	0.1071	2	No	20	0.1126	0.009649	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1607	0.0747	0.0682	2	No	20	0.07504	0.01671	0	None	No	0.01	NP (normality)
Beryllium total (mg/L)	MW-1606	0.00005	0.000007	0.004	No	20	0.0000313	0.00002139	55	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1607	0.00005	0.000005	0.004	No	20	0.00004775	0.00001006	95	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1606	0.00002	0.00001	0.005	No	20	0.00001475	0.000008626	40	None	No	0.01	NP (normality)
Cadmium total (mg/L)	MW-1607	0.0001622	0.0001013	0.005	No	20	0.0001318	0.00005366	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1606	0.000267	0.0001682	0.1	No	20	0.0002315	0.0001155	0	None	ln(x)	0.01	Param.
Chromium total (mg/L)	MW-1607	0.000212	0.0001	0.1	No	20	0.0002052	0.0001618	10	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1606	0.005443	0.004266	0.006	No	20	0.004855	0.001037	0	None	No	0.01	Param.
<b>Cobalt total (mg/L)</b>	<b>MW-1607</b>	<b>0.01069</b>	<b>0.008304</b>	<b>0.006</b>	<b>Yes</b>	<b>20</b>	<b>0.009499</b>	<b>0.002103</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Combined Radium 226 and 228 (pCi/L)	MW-1606	2.338	1.283	5.19	No	20	1.923	1.198	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1607	1.356	0.7228	5.19	No	20	1.04	0.5576	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1606	0.2257	0.1823	4	No	20	0.204	0.03817	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1607	0.239	0.211	4	No	20	0.225	0.0246	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1606	0.0006403	0.0003923	0.015	No	20	0.0005163	0.0002183	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1607	0.0005902	0.0004073	0.015	No	20	0.0004988	0.000161	0	None	No	0.01	Param.
<b>Lithium total (mg/L)</b>	<b>MW-1606</b>	<b>0.0862</b>	<b>0.05834</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>0.07227</b>	<b>0.02453</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
<b>Lithium total (mg/L)</b>	<b>MW-1607</b>	<b>0.1287</b>	<b>0.1183</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>0.1235</b>	<b>0.009082</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Mercury total (mg/L)	MW-1606	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1607	0.001	0.00008	0.002	No	20	0.000954	0.0002057	95	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1606	0.07498	0.05416	0.1	No	20	0.06457	0.01834	0	None	No	0.01	Param.
<b>Molybdenum total (mg/L)</b>	<b>MW-1607</b>	<b>0.1533</b>	<b>0.1308</b>	<b>0.1</b>	<b>Yes</b>	<b>20</b>	<b>0.142</b>	<b>0.01981</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Selenium total (mg/L)	MW-1606	0.0001402	0.00007466	0.05	No	20	0.0001145	0.00006747	15	None	x^(1/3)	0.01	Param.
Selenium total (mg/L)	MW-1607	0.0002488	0.000114	0.05	No	20	0.000194	0.0001466	5	None	sqrt(x)	0.01	Param.
Thallium total (mg/L)	MW-1606	0.0002	0.00005	0.002	No	20	0.000148	0.00007374	65	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1607	0.0002	0.00005	0.002	No	20	0.000144	0.00008022	65	None	No	0.01	NP (NDs)

# Confidence Intervals - Dumps Fault - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 9:10 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt total (mg/L)	MW-1610	0.009093	0.006366	0.006	Yes	20	0.00773	0.002401	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1610	0.1769	0.122	0.1	Yes	20	0.1547	0.05485	0	None	ln(x)	0.01	Param.

# Confidence Intervals - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 9:10 AM

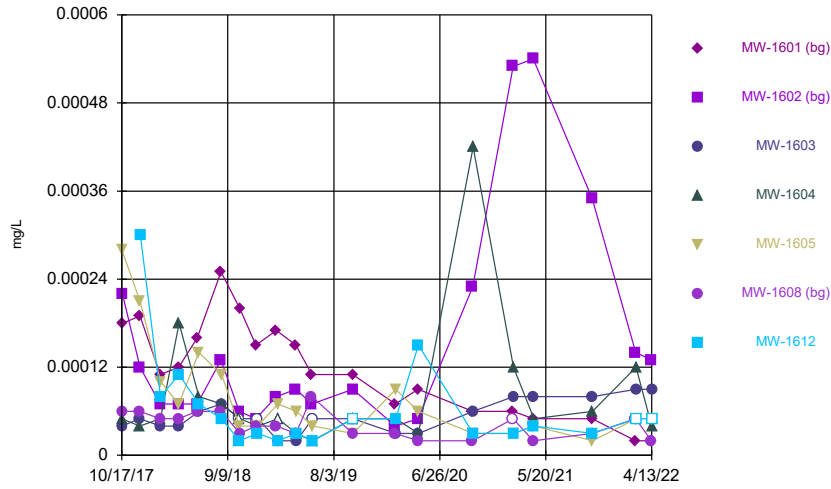
Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1610	0.0002369	0.0000526	0.006	No	20	0.000275	0.0004363	5	None	ln(x)	0.01	Param.
Arsenic total (mg/L)	MW-1610	0.00167	0.00124	0.046	No	20	0.001665	0.001042	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1610	0.2666	0.2129	2	No	20	0.2398	0.04721	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1610	0.00005	0.000007	0.004	No	20	0.00004095	0.00001858	80	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1610	0.00003	0.000008	0.005	No	20	0.00001855	0.00001408	35	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1610	0.000262	0.000174	0.1	No	20	0.000251	0.0001499	0	None	No	0.01	NP (normality)
<b>Cobalt total (mg/L)</b>	<b>MW-1610</b>	<b>0.009093</b>	<b>0.006366</b>	<b>0.006</b>	<b>Yes</b>	<b>20</b>	<b>0.00773</b>	<b>0.002401</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Combined Radium 226 and 228 (pCi/L)	MW-1610	1.315	0.7461	5	No	20	1.03	0.5007	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1610	0.22	0.18	4	No	20	0.2095	0.04148	0	None	No	0.01	NP (normality)
Lead total (mg/L)	MW-1610	0.008704	0.003463	0.015	No	20	0.006084	0.004615	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1610	0.2106	0.1638	0.165	No	20	0.1892	0.04588	0	None	x^(1/3)	0.01	Param.
Mercury total (mg/L)	MW-1610	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
<b>Molybdenum total (mg/L)</b>	<b>MW-1610</b>	<b>0.1769</b>	<b>0.122</b>	<b>0.1</b>	<b>Yes</b>	<b>20</b>	<b>0.1547</b>	<b>0.05485</b>	<b>0</b>	<b>None</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param.</b>
Selenium total (mg/L)	MW-1610	0.0003578	0.0002092	0.05	No	20	0.0002835	0.0001308	5	None	No	0.01	Param.
Thallium total (mg/L)	MW-1610	0.0002	0.00003	0.002	No	20	0.000146	0.00008469	70	None	No	0.01	NP (NDs)

FIGURE A.



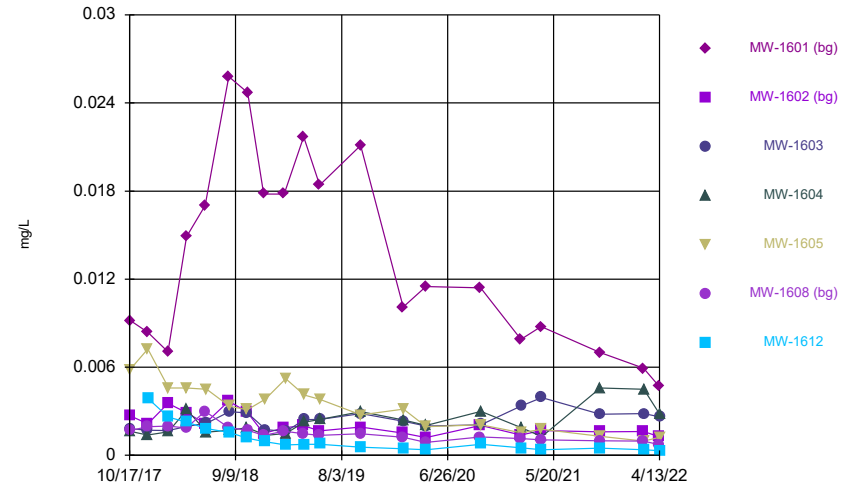
# Time Series - Chattanooga Shale

### Time Series



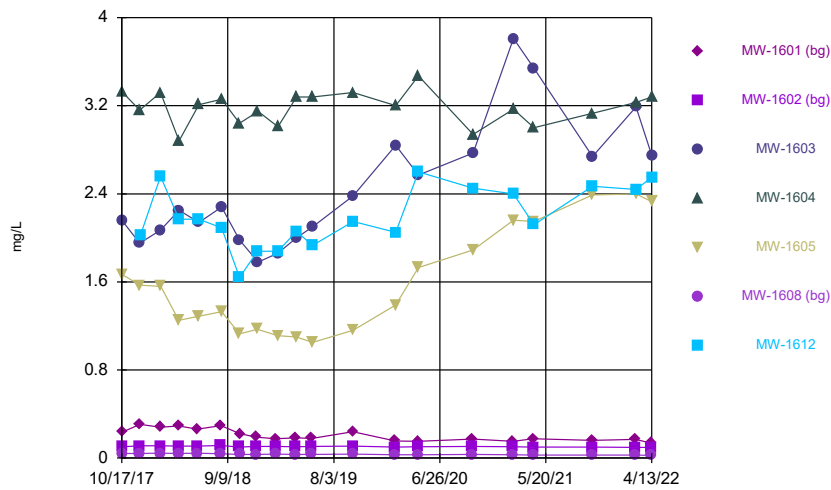
Constituent: Antimony total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



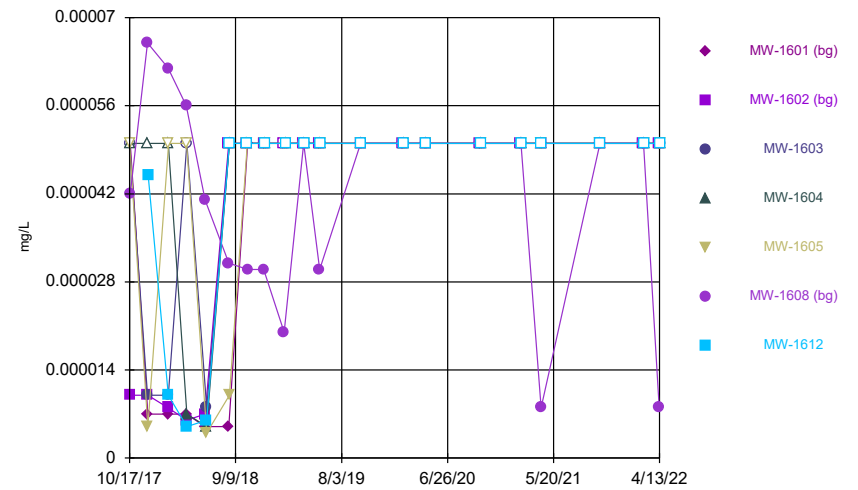
Constituent: Arsenic total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



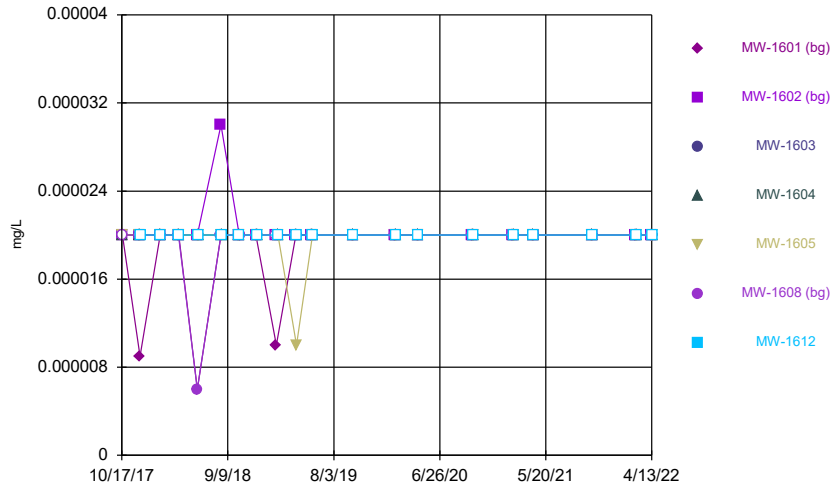
Constituent: Barium total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



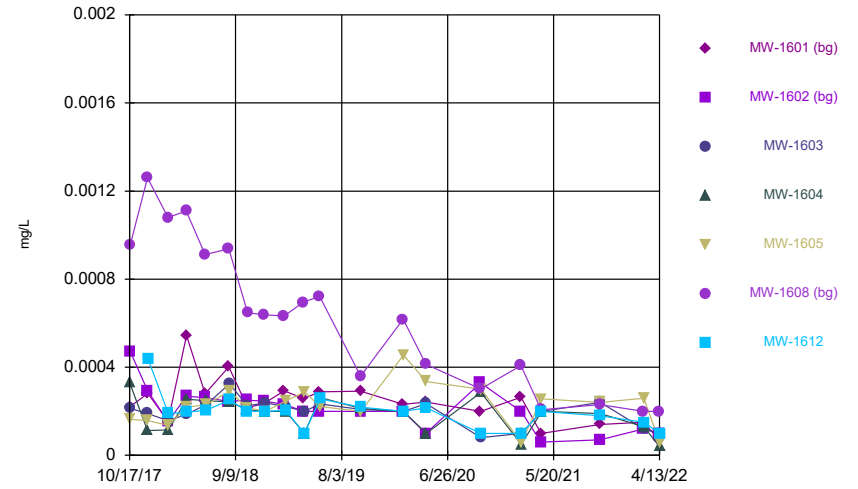
Constituent: Beryllium total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



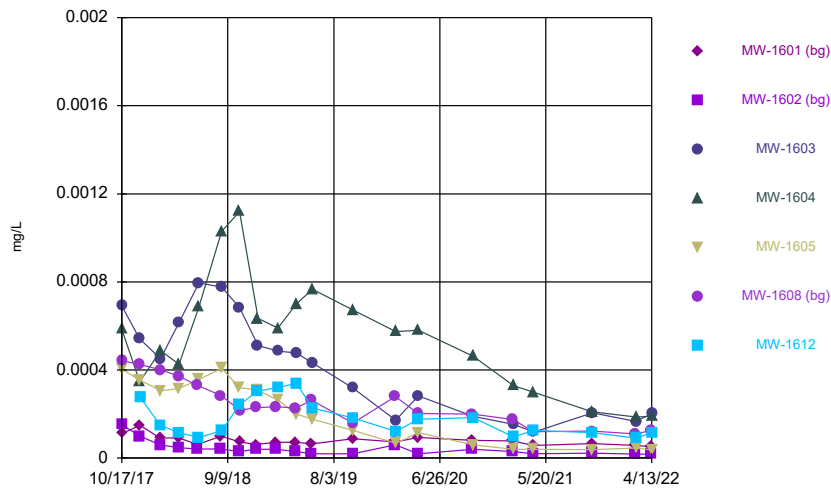
Constituent: Cadmium total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



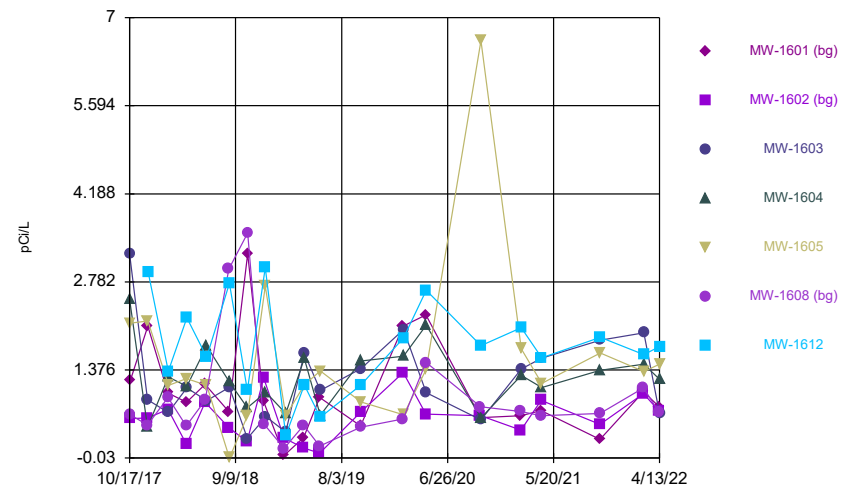
Constituent: Chromium total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



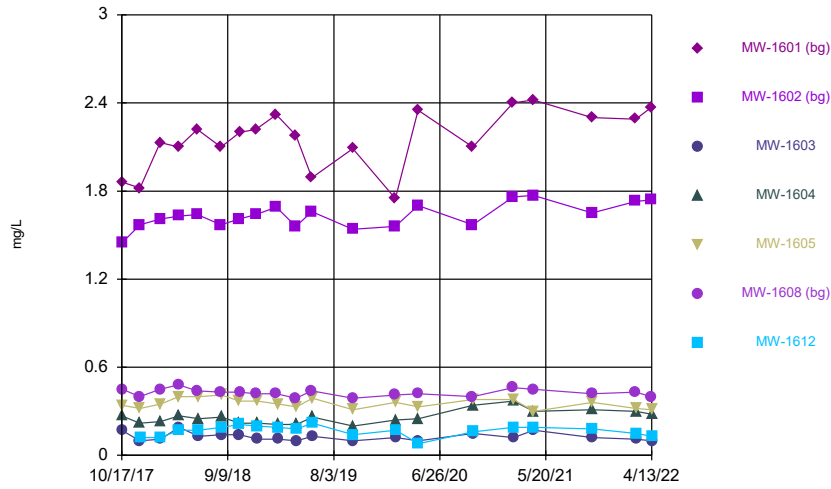
Constituent: Cobalt total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



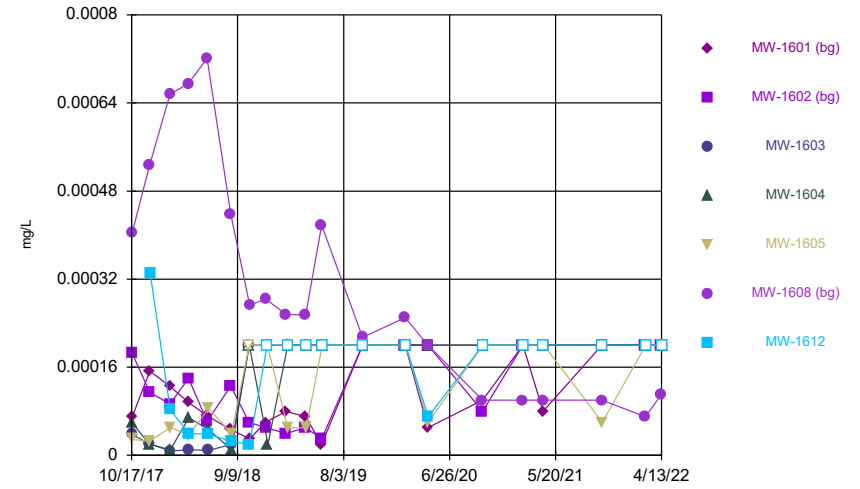
Constituent: Combined Radium 226 and 228 Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale -  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



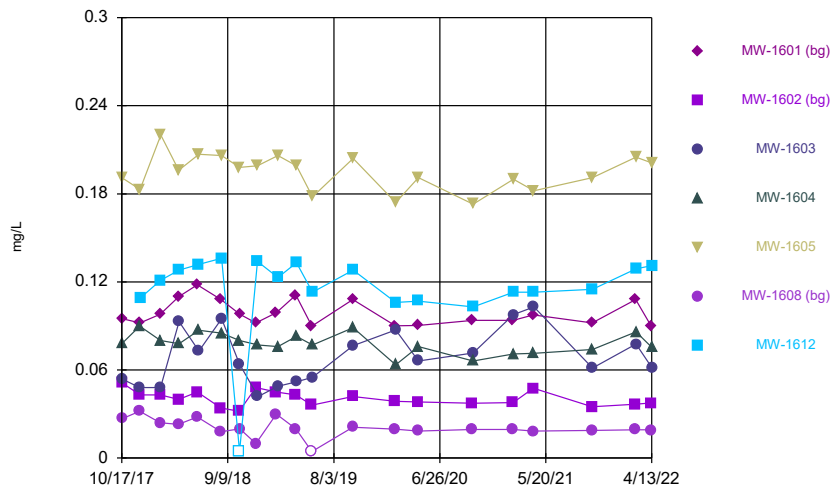
Constituent: Fluoride total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



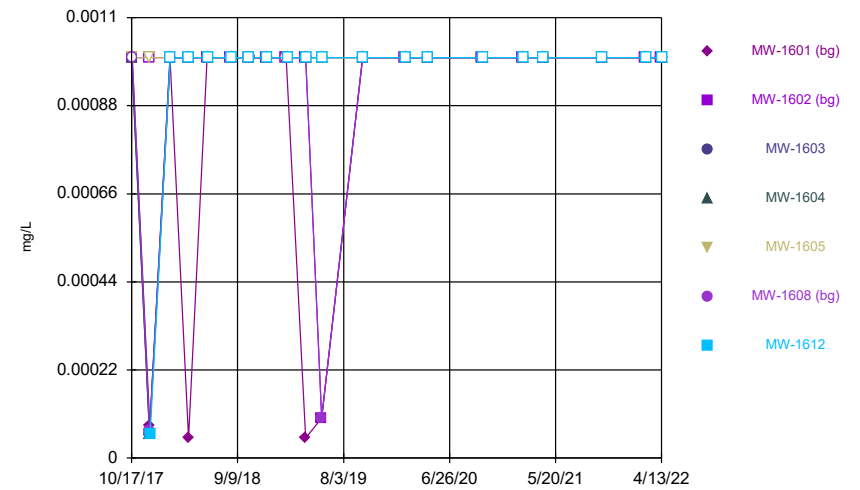
Constituent: Lead total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



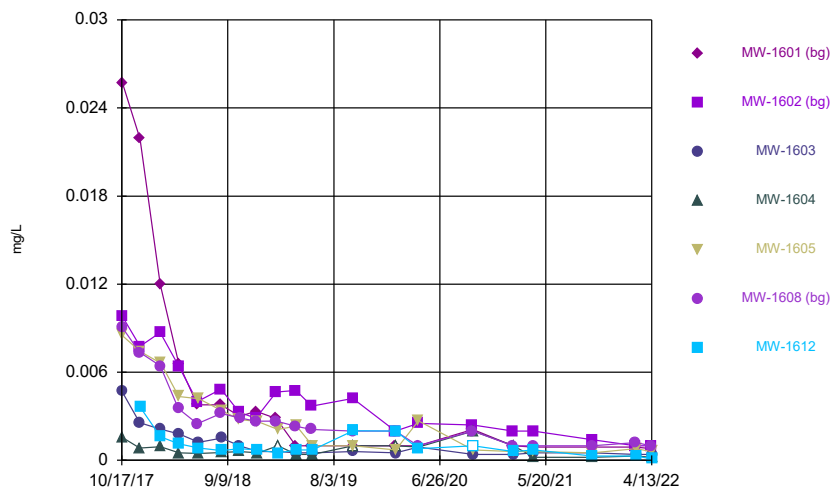
Constituent: Lithium total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



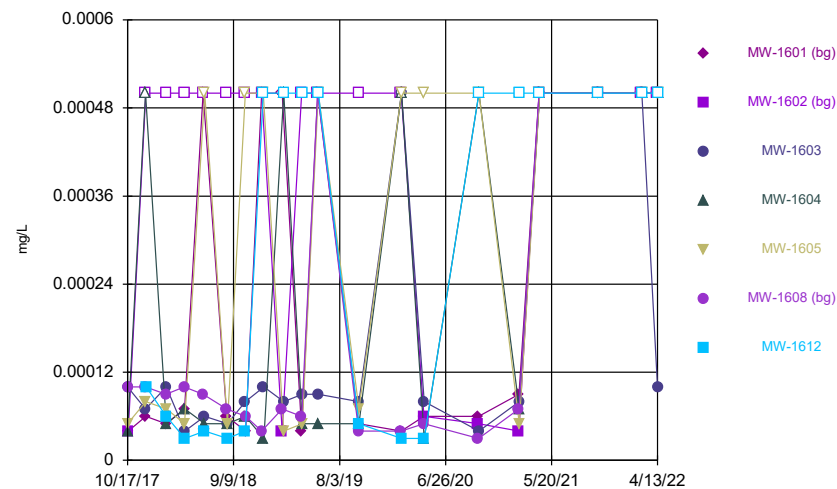
Constituent: Mercury total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



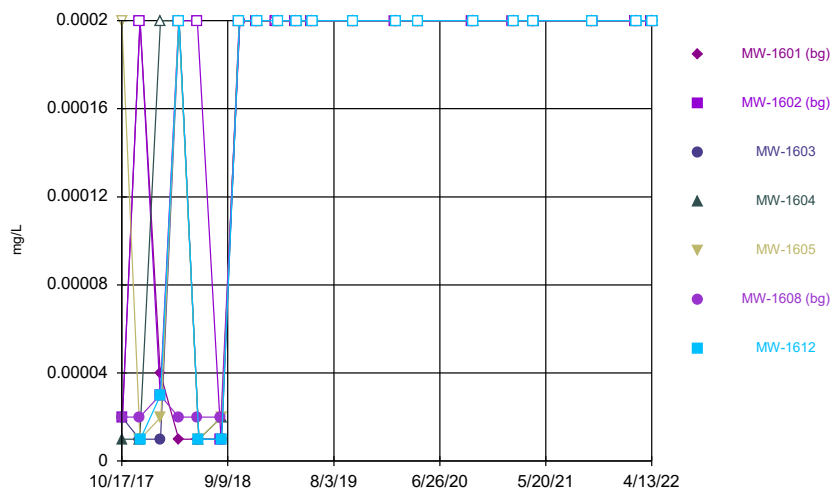
Constituent: Molybdenum total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



Constituent: Selenium total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series

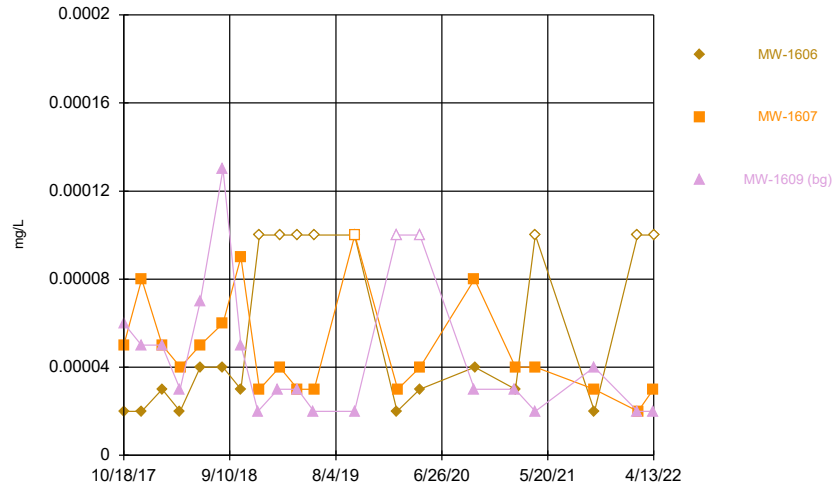


Constituent: Thallium total Analysis Run 7/21/2022 2:54 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

# **Time Series - Rome Limestone**

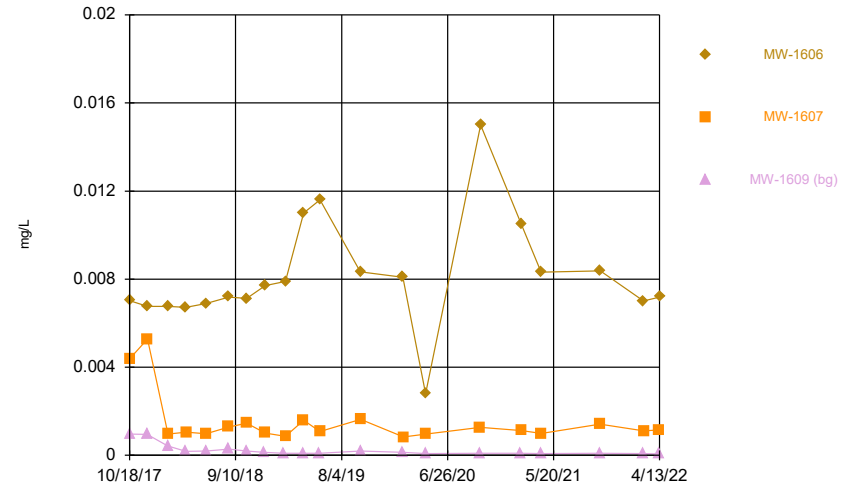
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Time Series



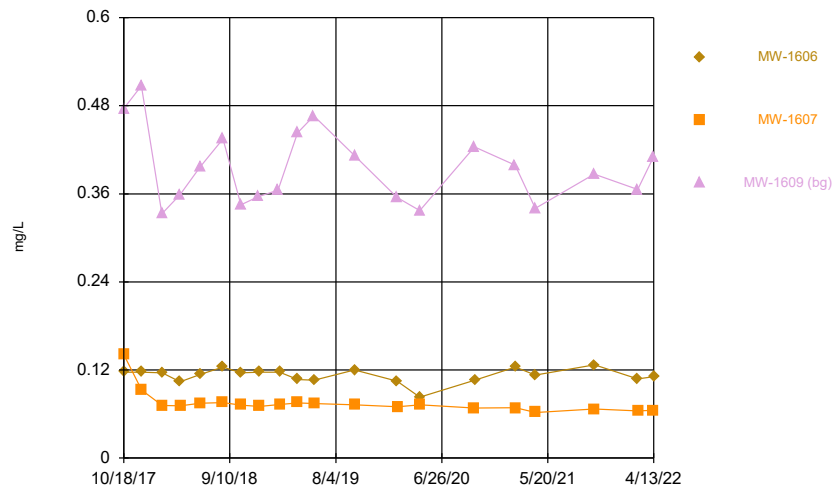
Constituent: Antimony total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



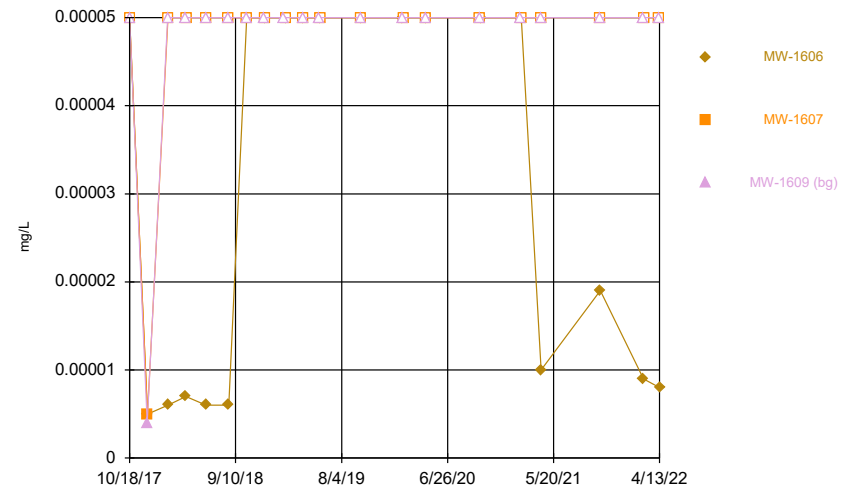
Constituent: Arsenic total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



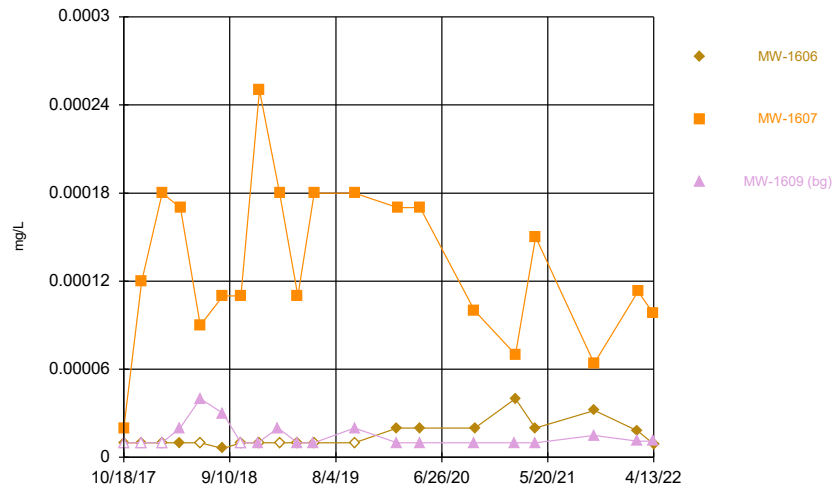
Constituent: Barium total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



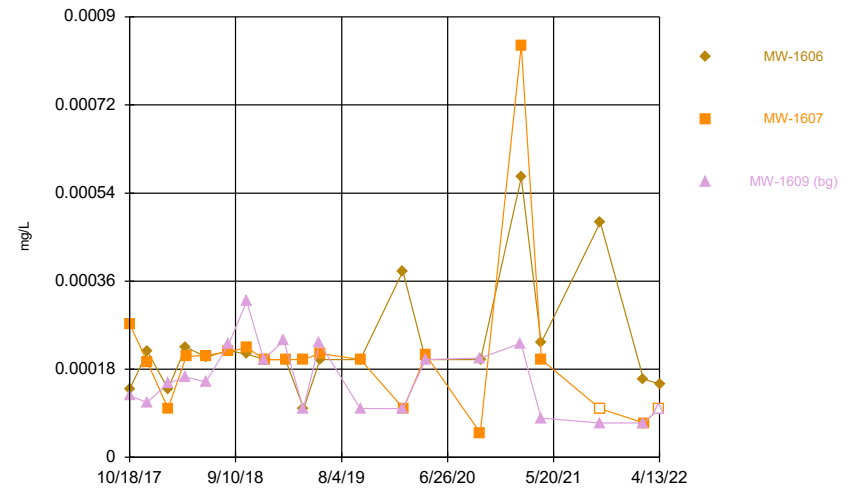
Constituent: Beryllium total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



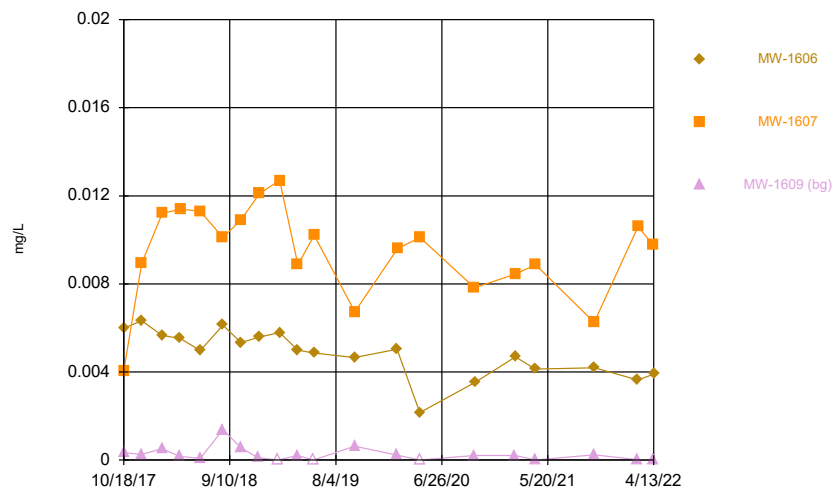
Constituent: Cadmium total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

Time Series



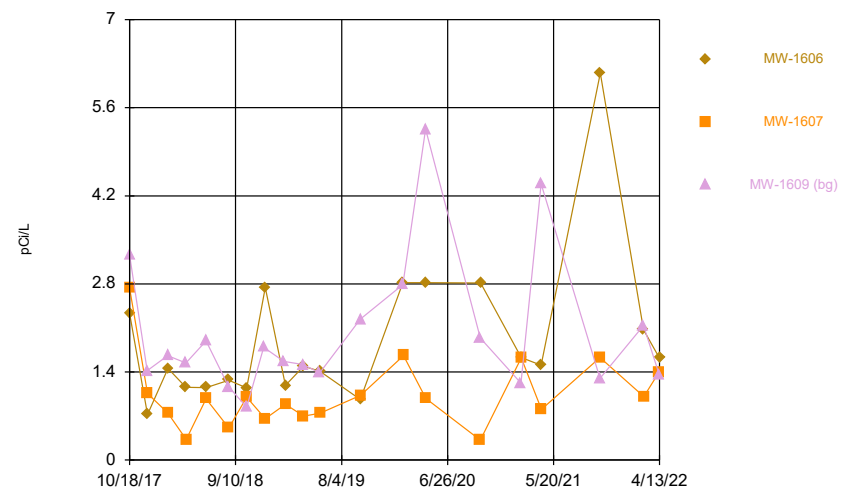
Constituent: Chromium total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Cobalt total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

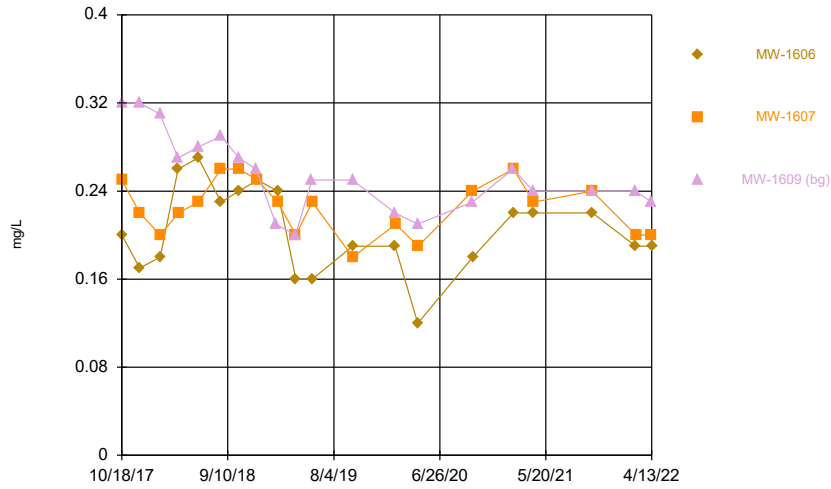
Time Series



Constituent: Combined Radium 226 and 228 Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - P  
 Clinch River LF Client: AEP Data: Clinch River

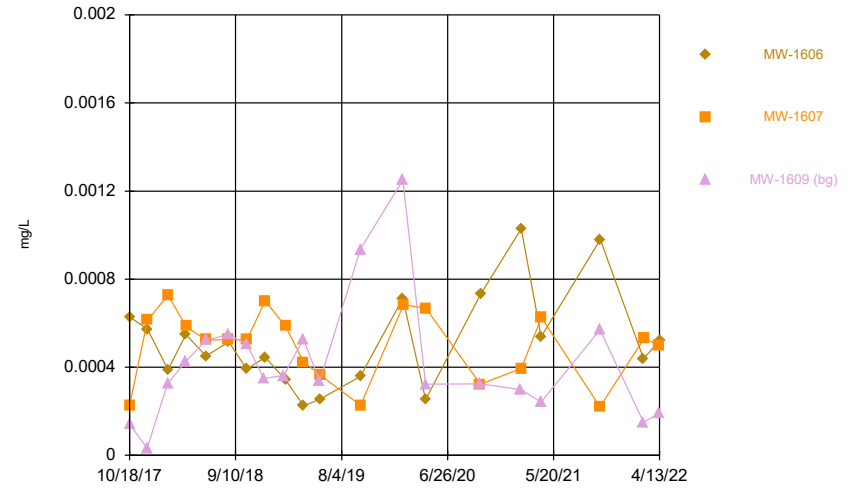


Time Series



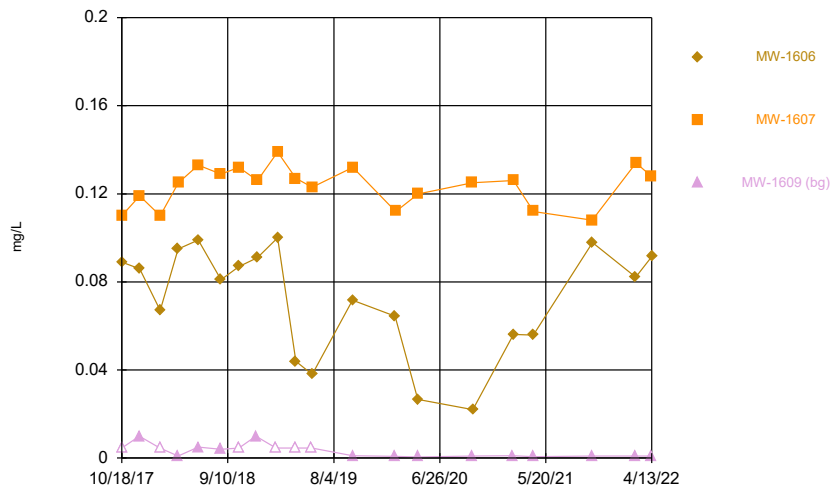
Constituent: Fluoride total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



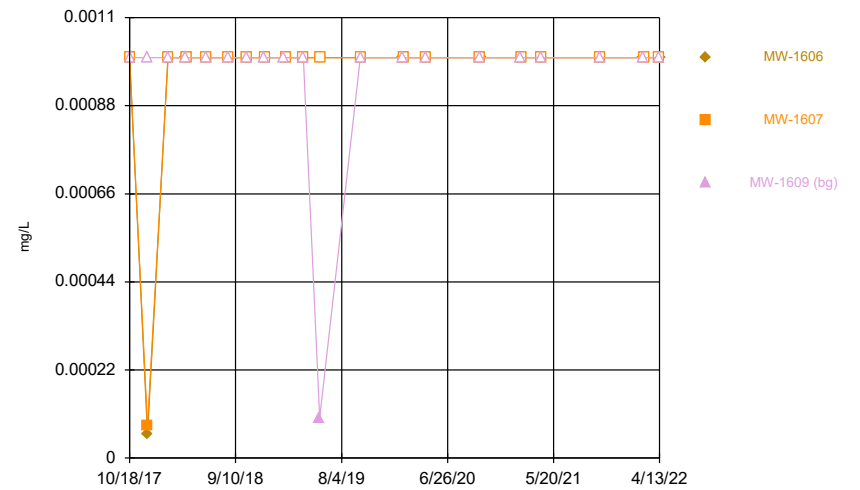
Constituent: Lead total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



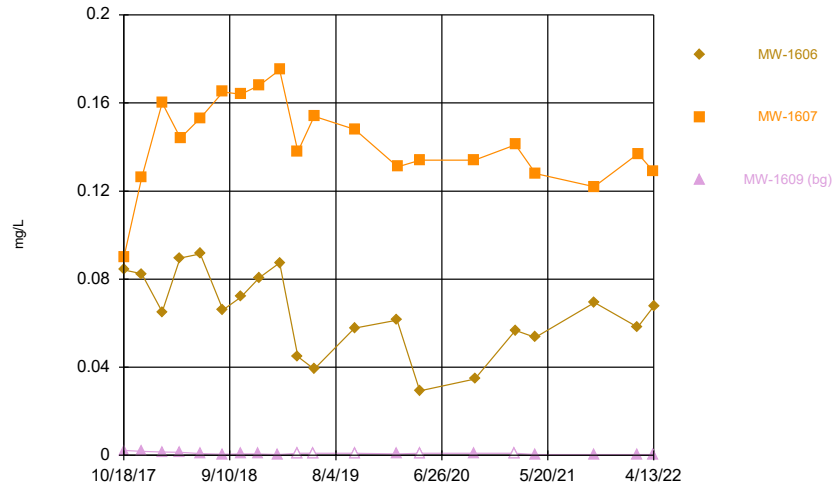
Constituent: Lithium total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Time Series



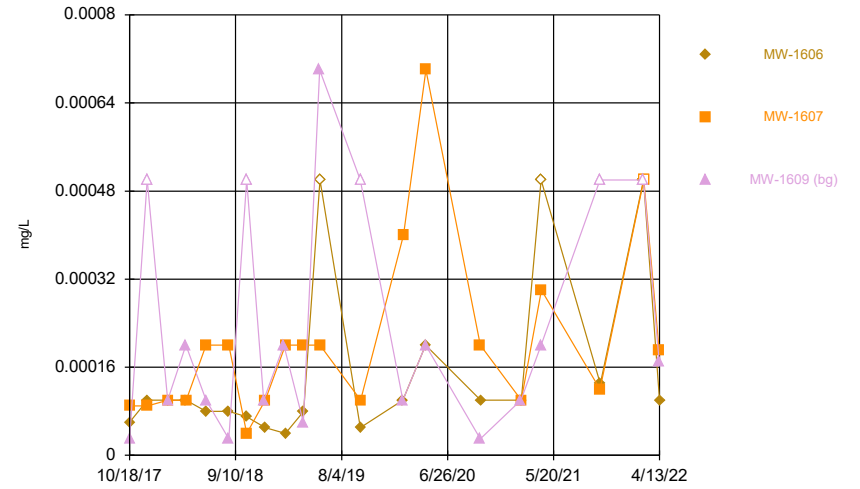
Constituent: Mercury total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



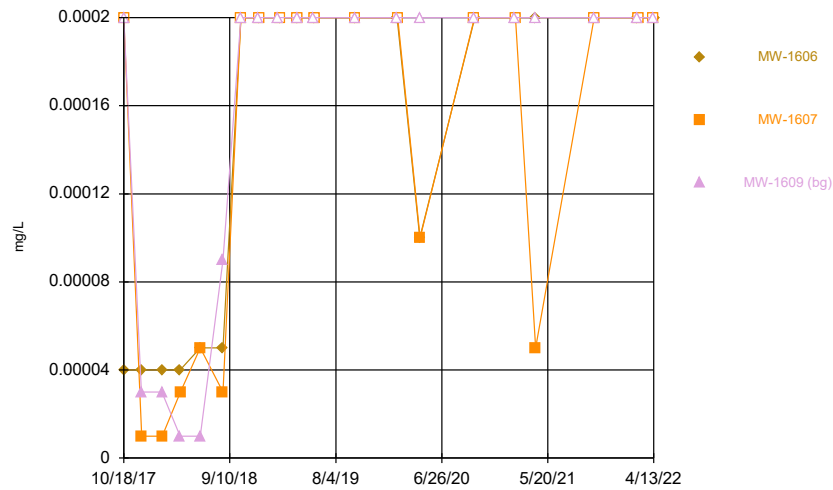
Constituent: Molybdenum total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



Constituent: Selenium total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series

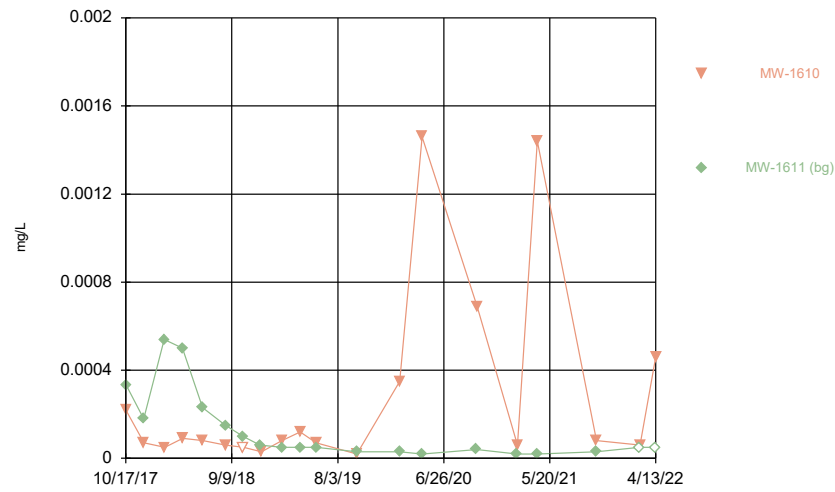


Constituent: Thallium total Analysis Run 7/21/2022 3:16 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

# **Time Series - Dumps Fault**

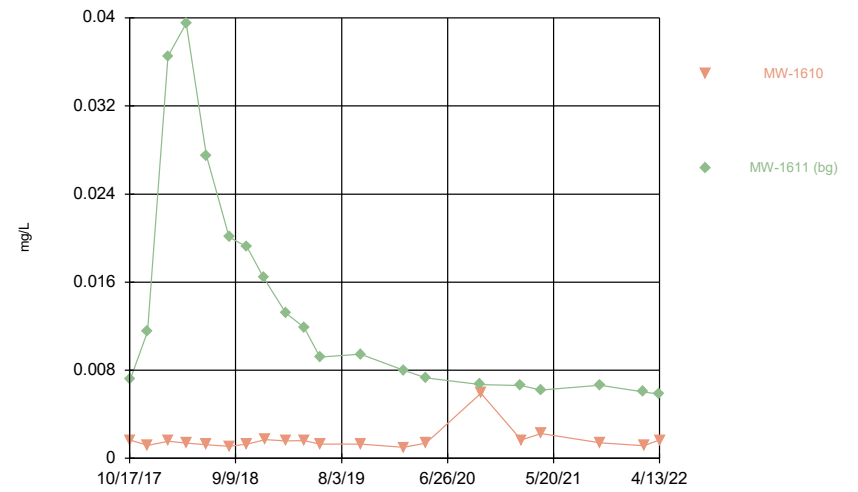
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### Time Series



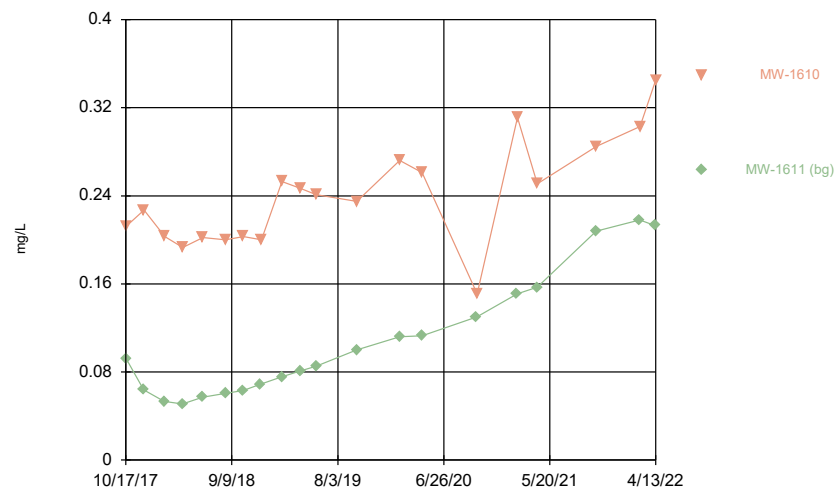
Constituent: Antimony total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



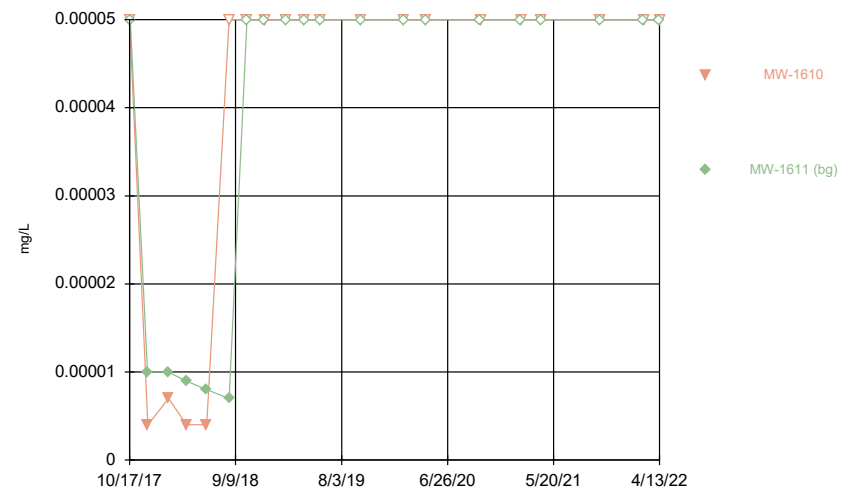
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Clinch River LF Client: AEP Data: Clinch River

### Time Series



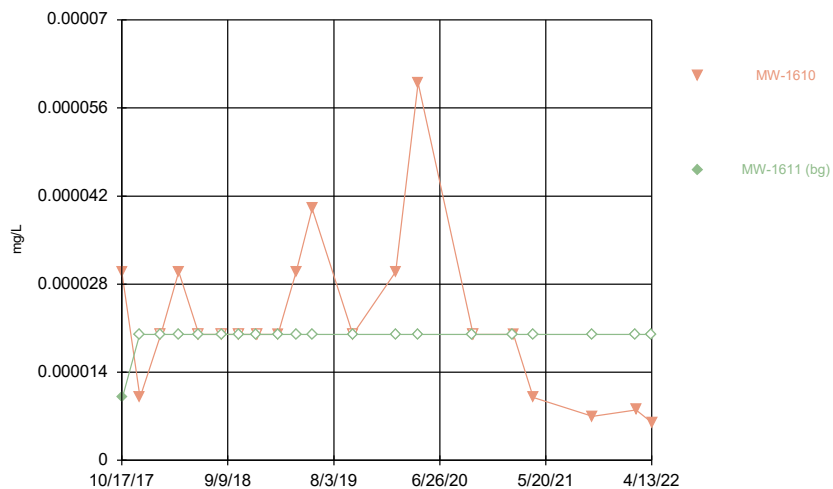
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Clinch River LF Client: AEP Data: Clinch River

### Time Series



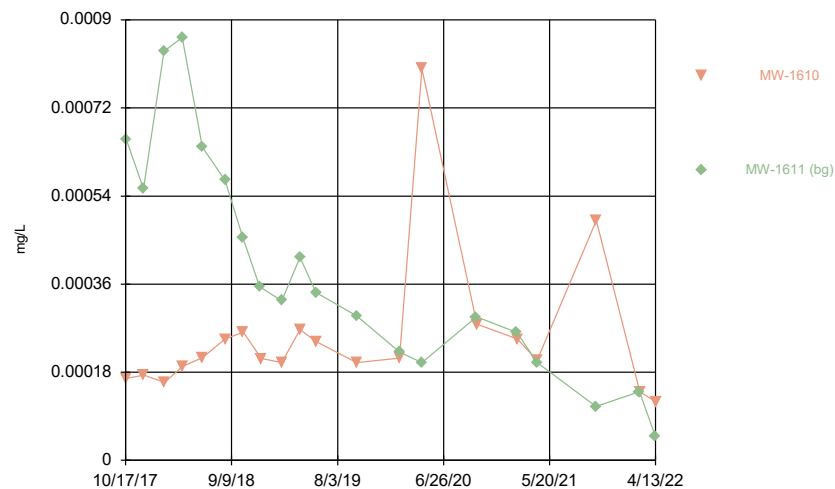
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Clinch River LF Client: AEP Data: Clinch River

Time Series



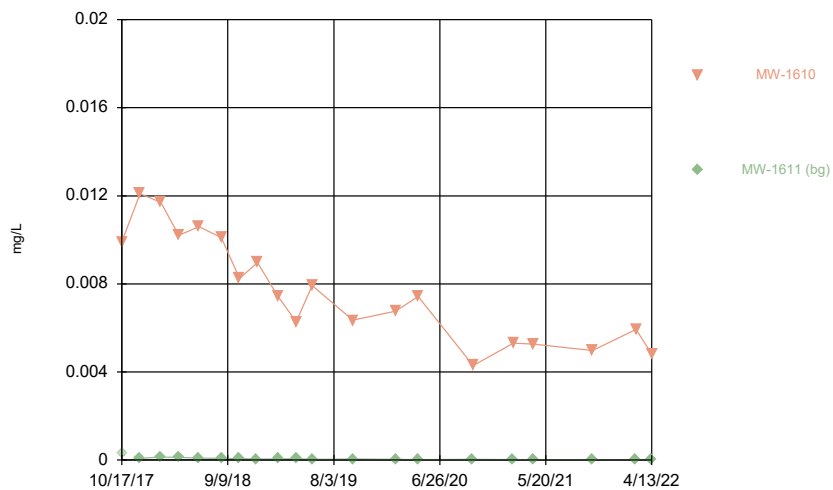
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



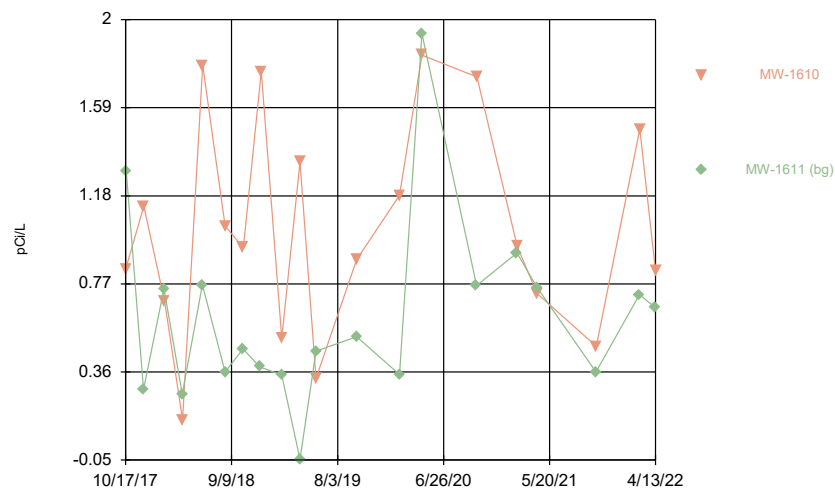
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 Clinch River LF Client: AEP Data: Clinch River

Time Series



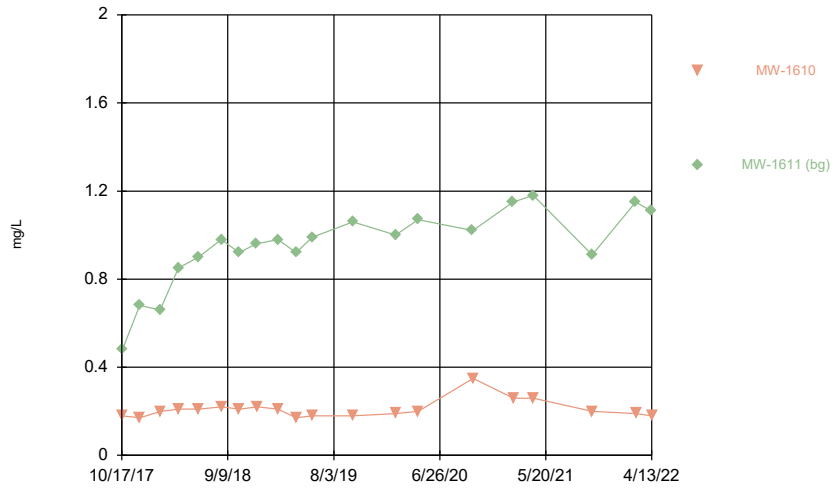
Constituent: Cobalt total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

Time Series



Constituent: Combined Radium 226 and 228 Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
 Clinch River LF Client: AEP Data: Clinch River

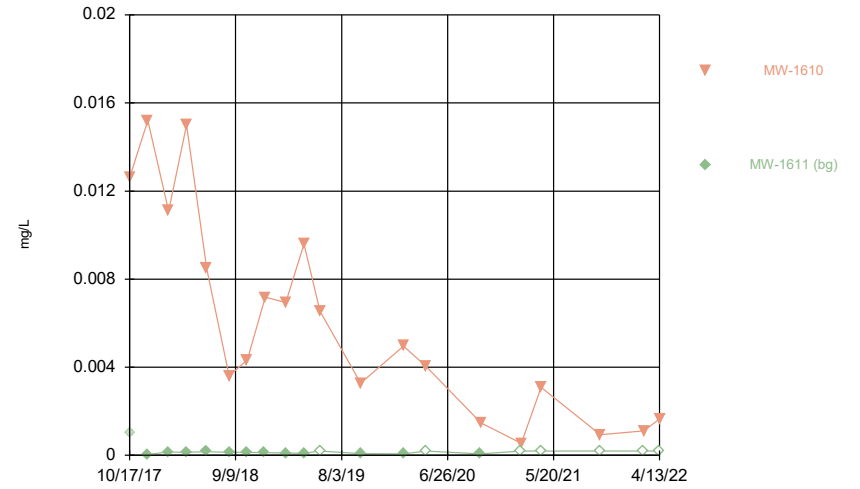
### Time Series



Constituent: Fluoride total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

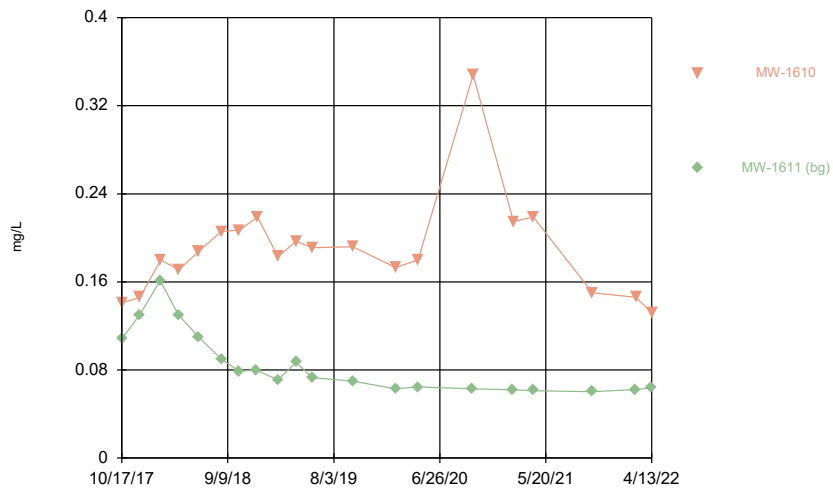
Hollow symbols indicate censored values.

### Time Series



Constituent: Lead total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

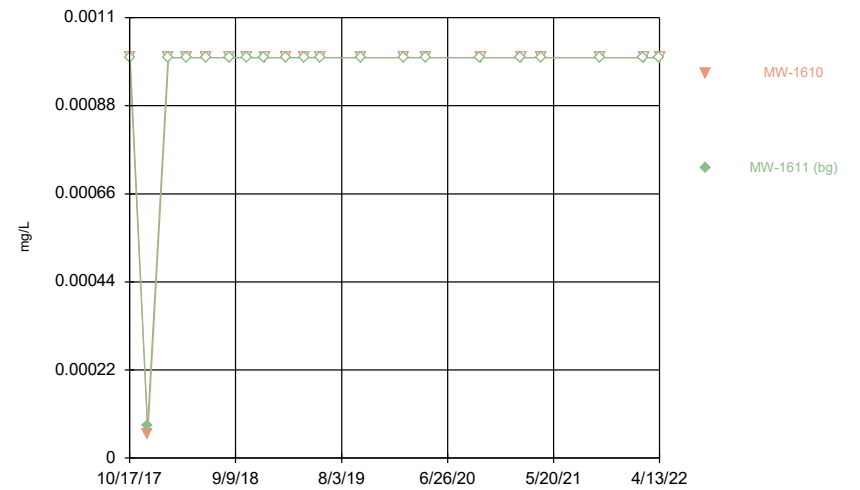
### Time Series



Constituent: Lithium total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

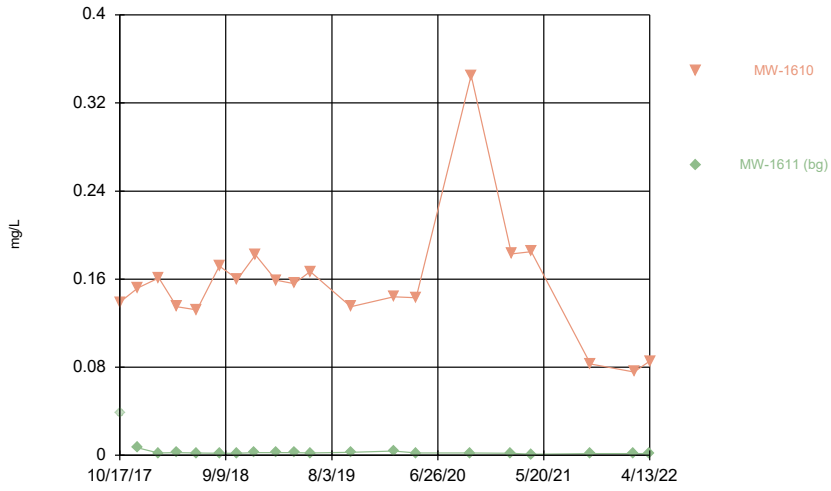
Hollow symbols indicate censored values.

### Time Series



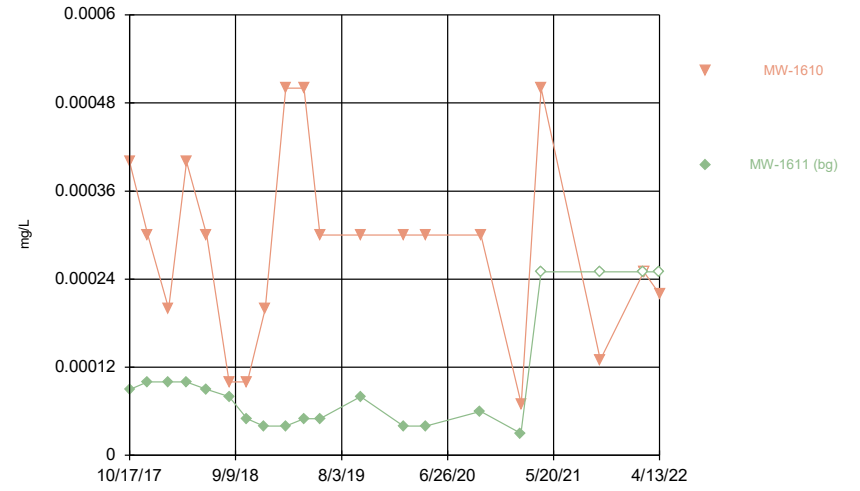
Constituent: Mercury total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



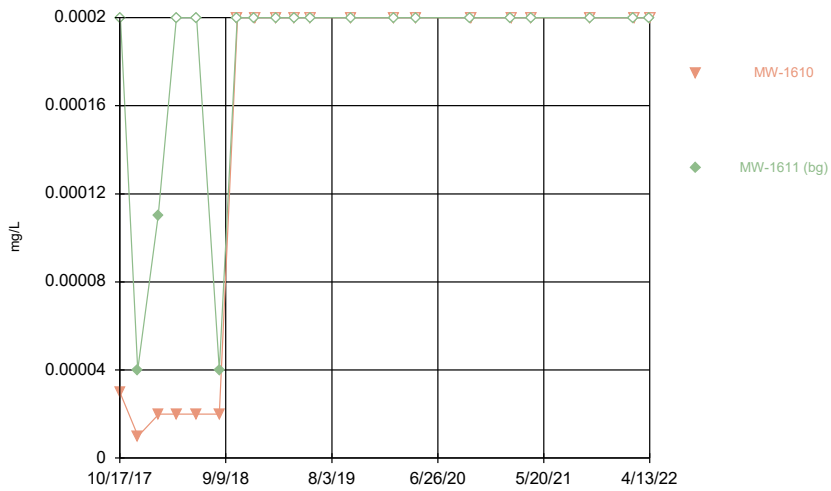
Constituent: Molybdenum total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



Constituent: Selenium total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Time Series



Constituent: Thallium total Analysis Run 7/21/2022 3:08 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

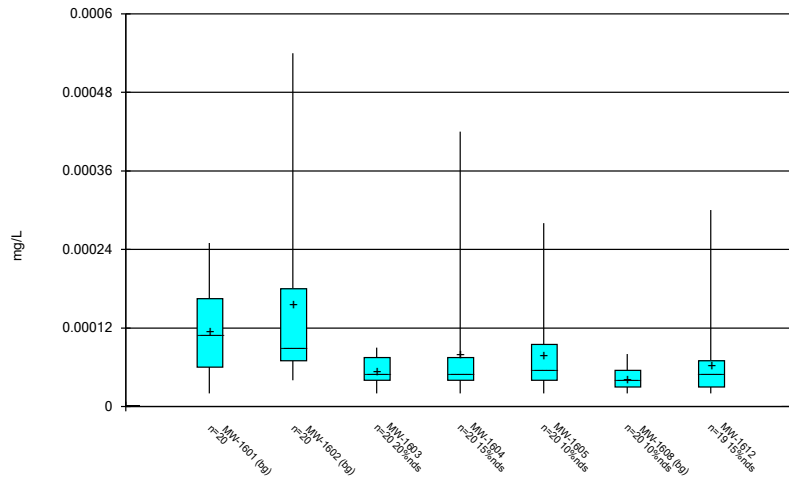
FIGURE B.



# **Box Plots - Chattanooga Shale**

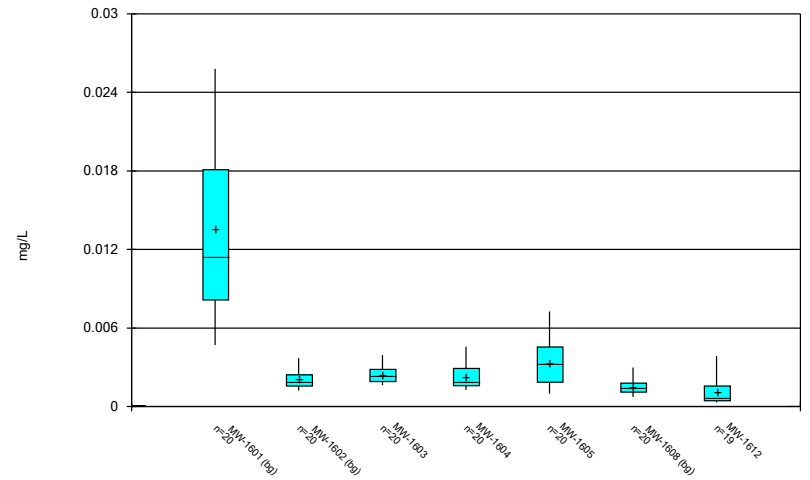
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Box & Whiskers Plot



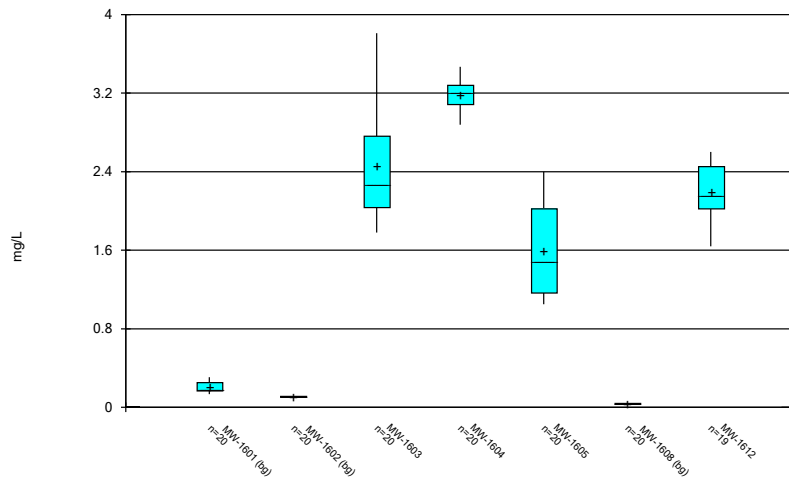
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



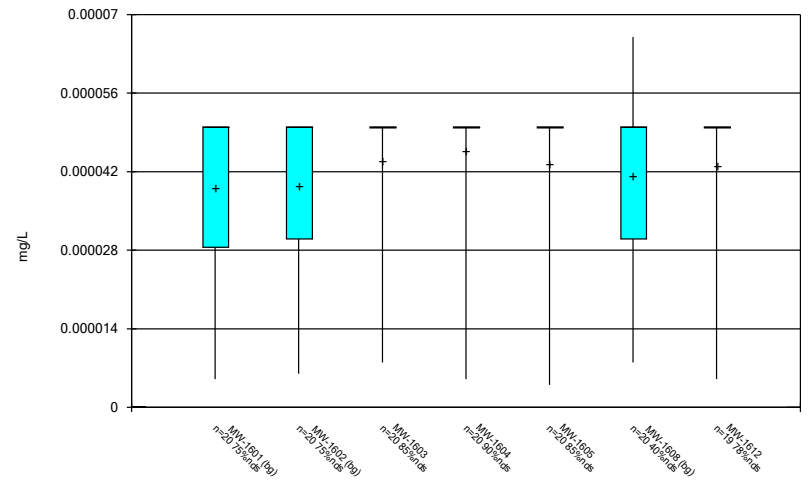
Constituent: Arsenic total Analysis Run 7/21/2022 2:55 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



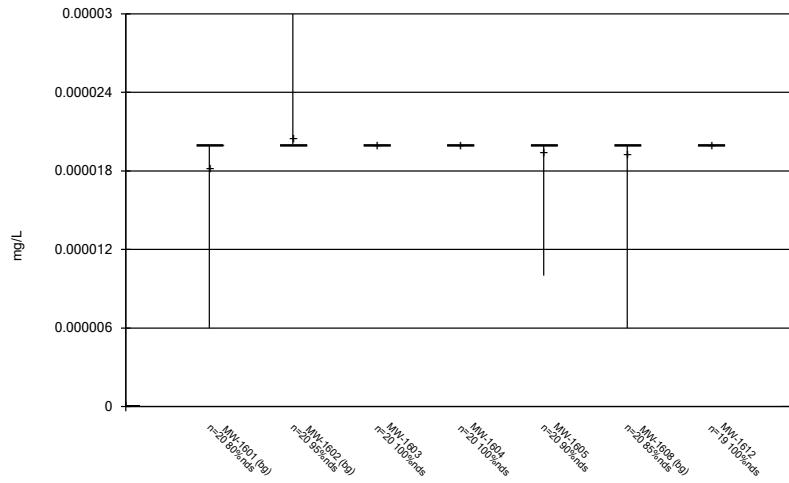
Constituent: Barium total Analysis Run 7/21/2022 2:55 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



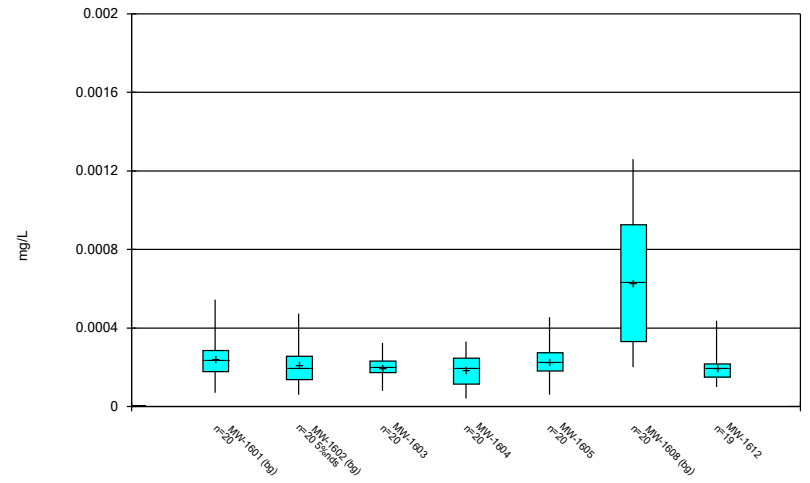
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



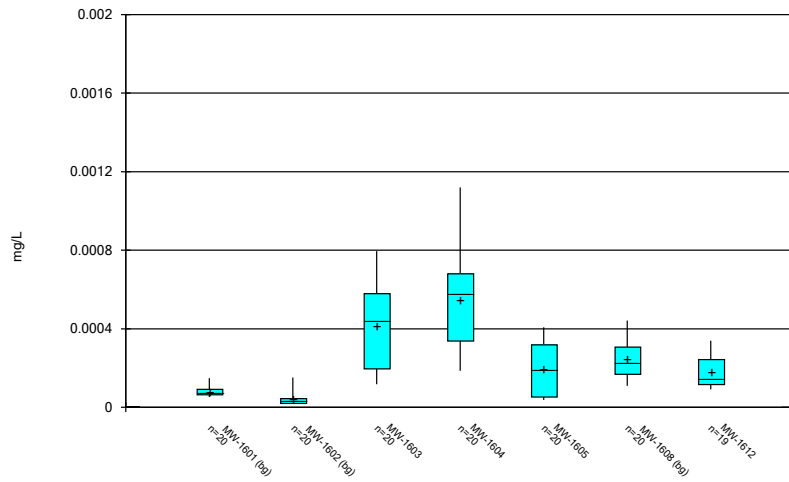
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



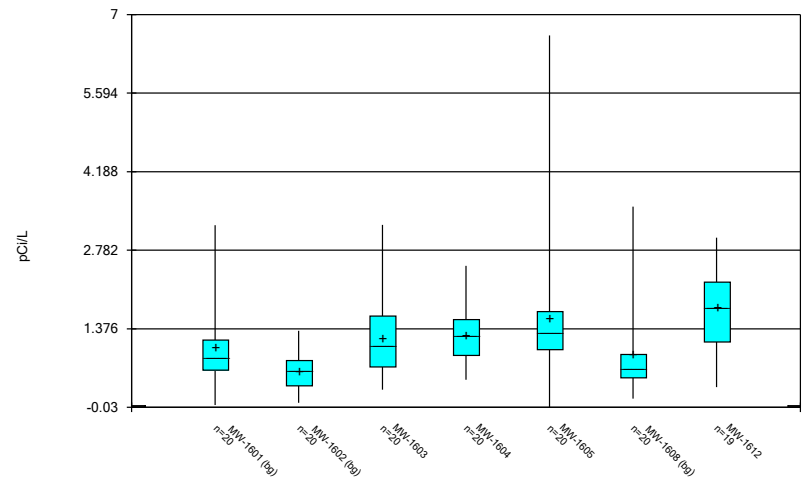
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



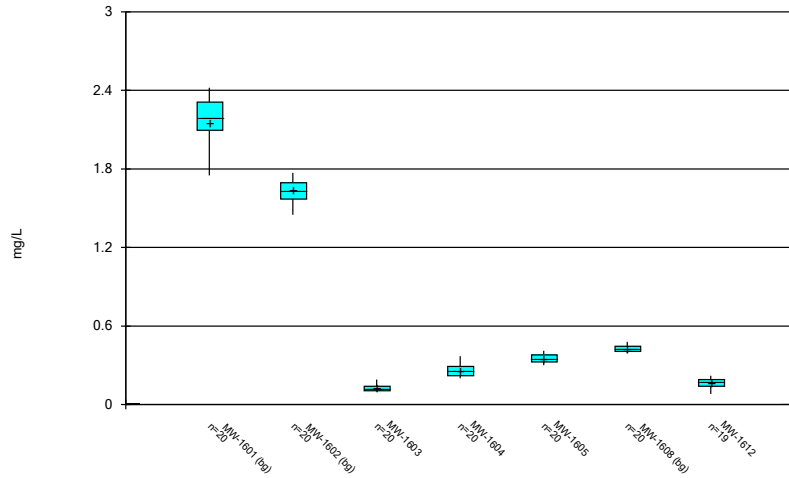
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



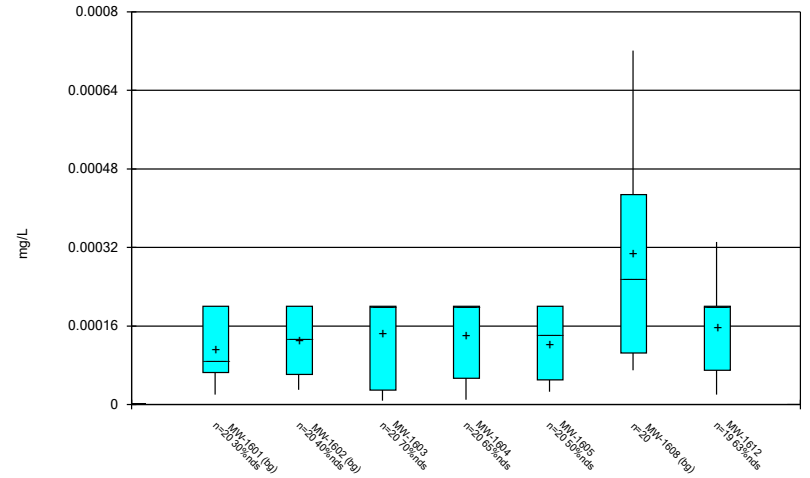
Constituent: Combined Radium 226 and 228 Analysis Run 7/21/2022 2:55 PM View: Chattanooga Shale -  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



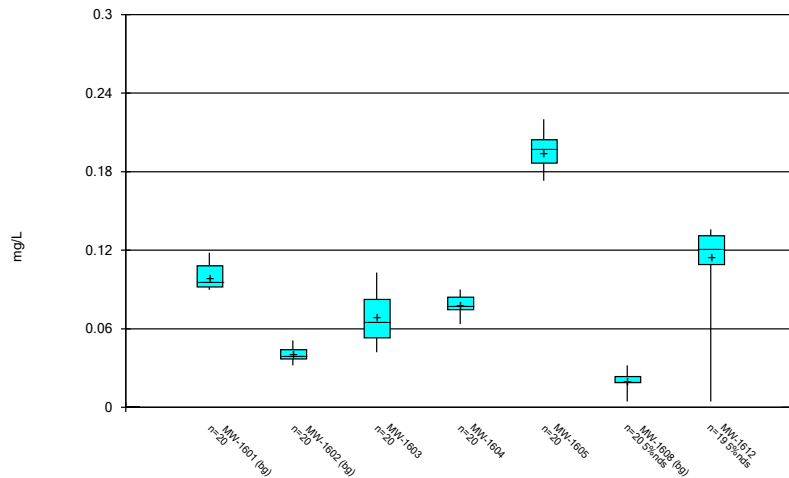
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



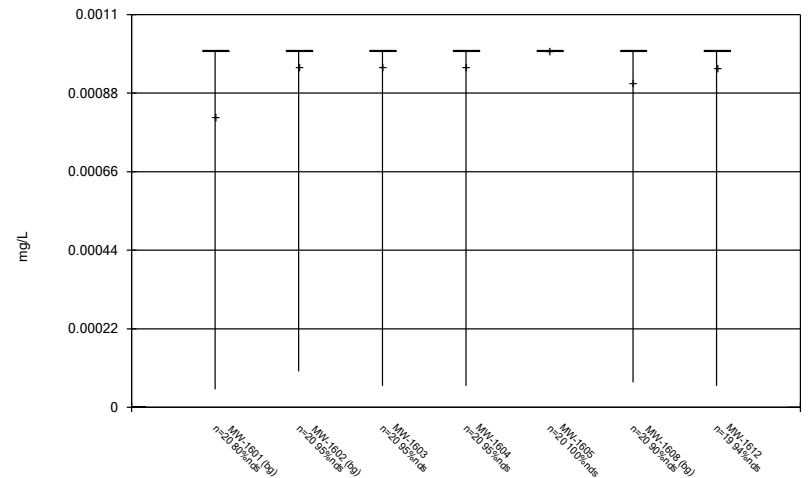
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



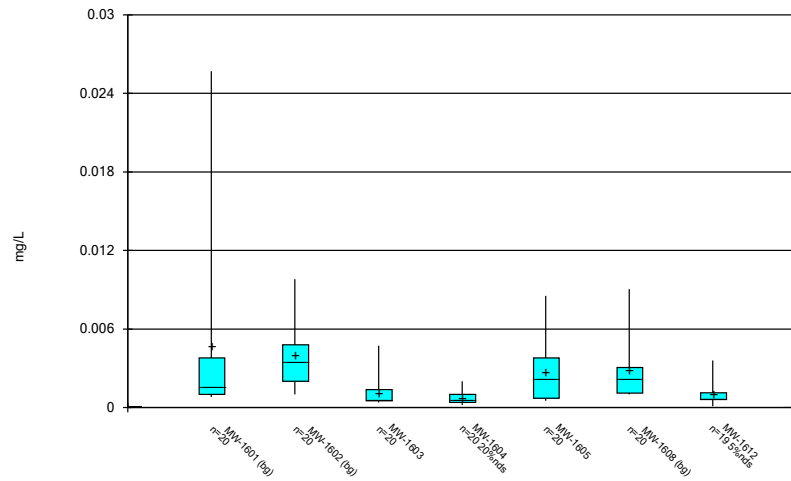
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



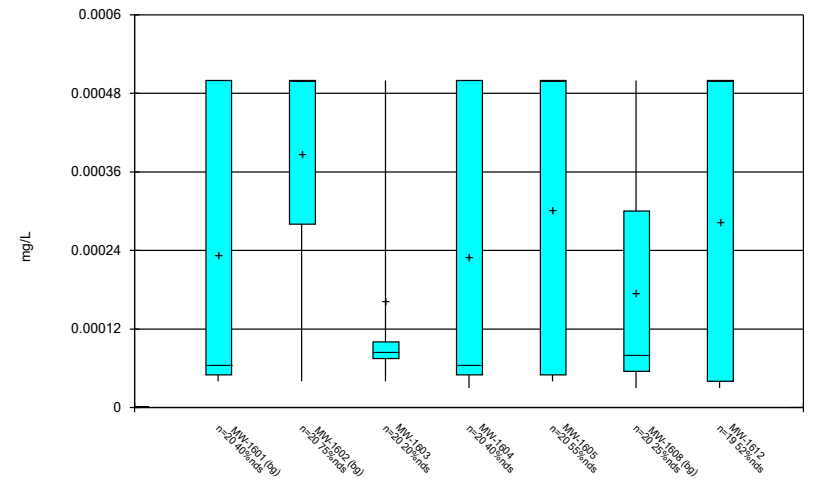
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



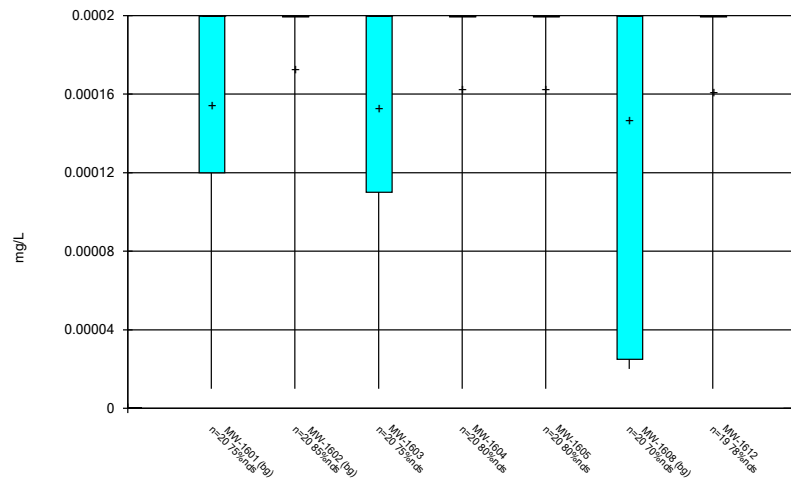
Constituent: Molybdenum total Analysis Run 7/21/2022 2:55 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Selenium total Analysis Run 7/21/2022 2:55 PM View: Chattanooga Shale - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot

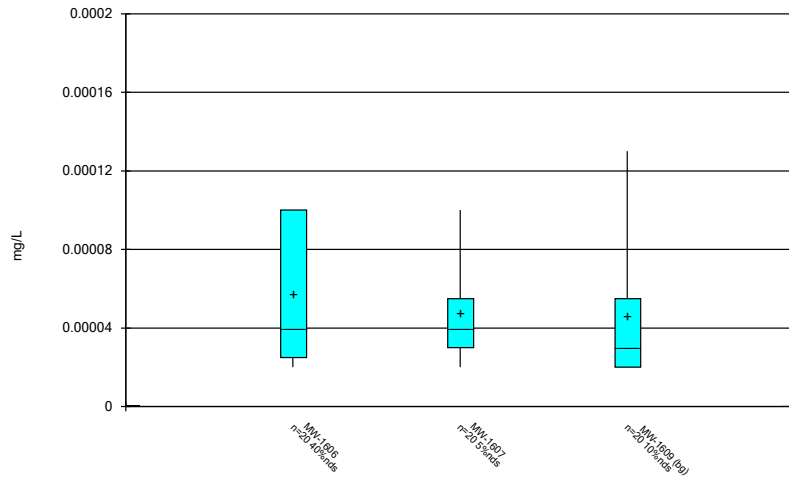


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Clinch River LF Client: AEP Data: Clinch River

# Box Plots - Rome Limestone

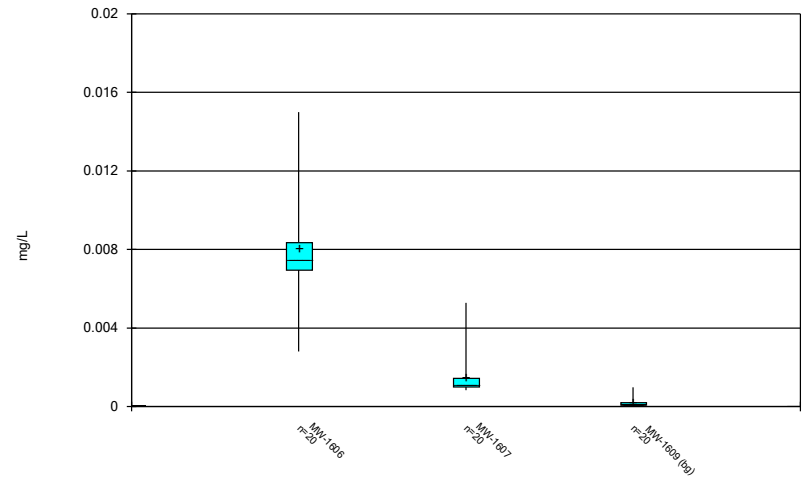
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Box & Whiskers Plot



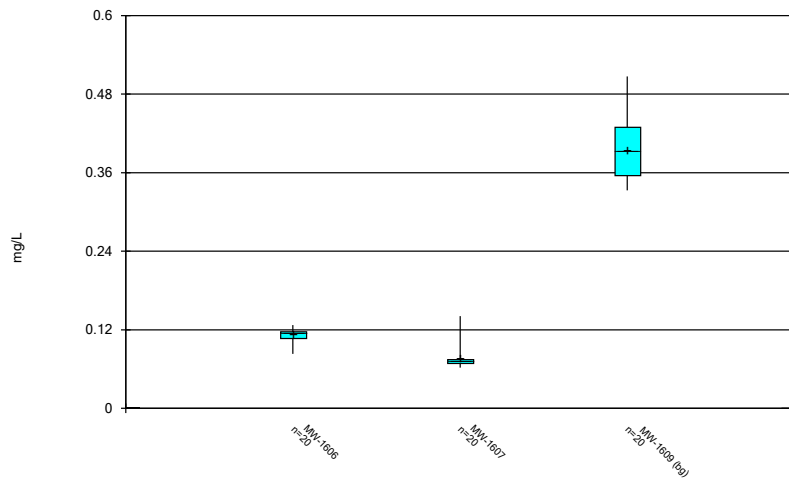
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



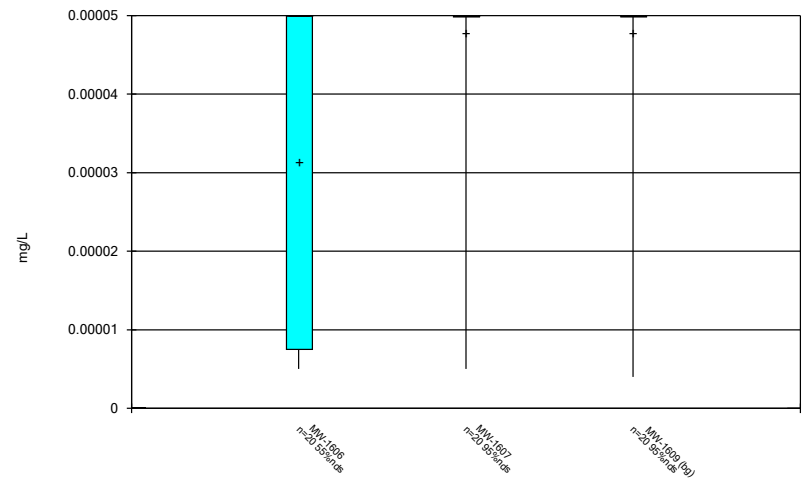
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



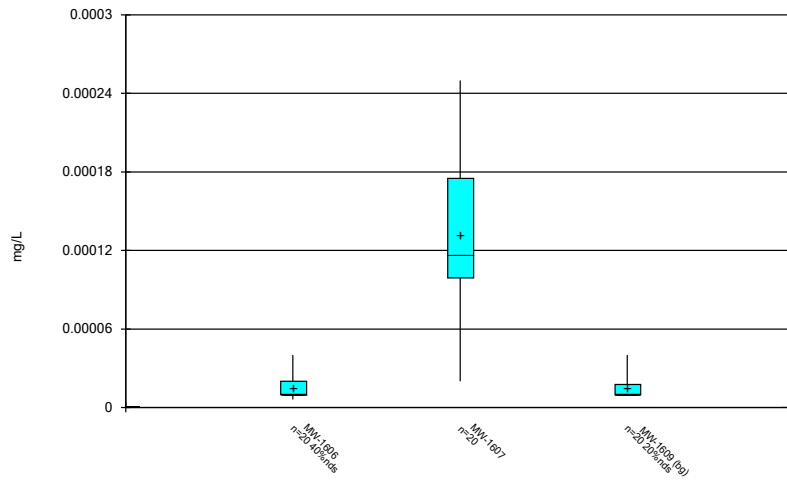
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



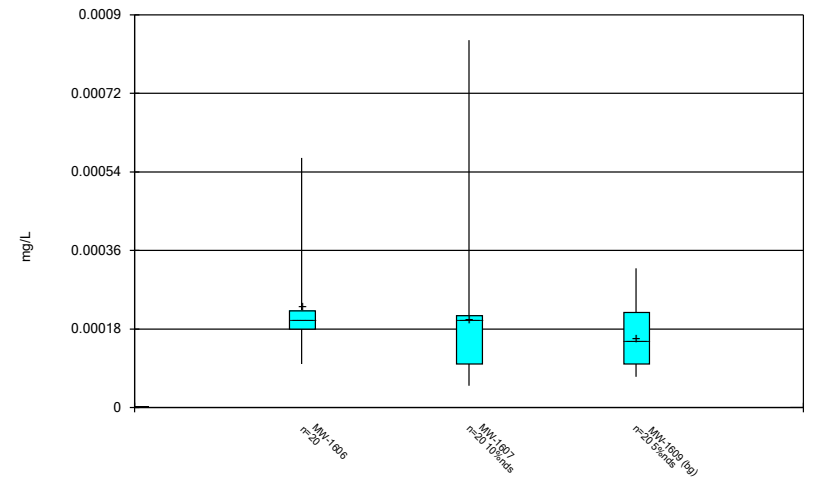
Constituent: Beryllium total Analysis Run 7/21/2022 3:17 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



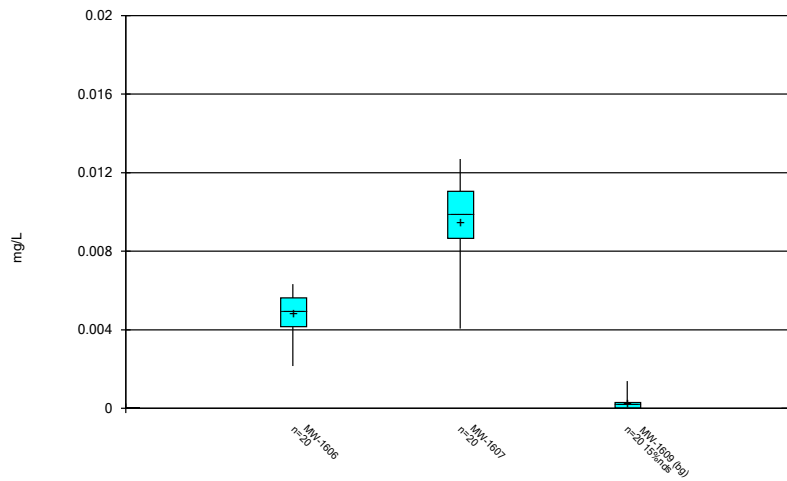
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Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



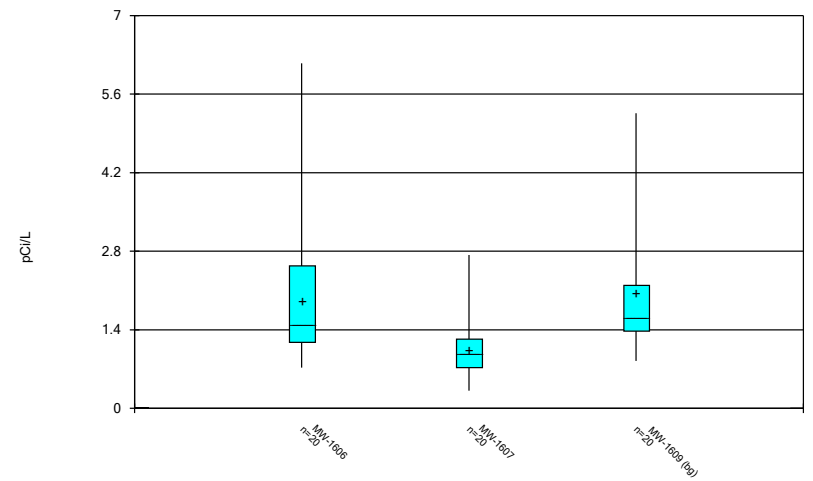
Constituent: Chromium total Analysis Run 7/21/2022 3:17 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Cobalt total Analysis Run 7/21/2022 3:17 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

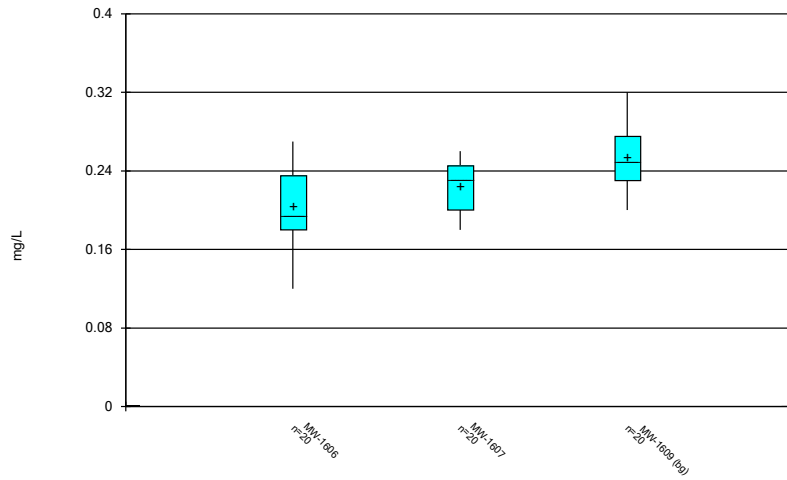
Box & Whiskers Plot



Constituent: Combined Radium 226 and 228 Analysis Run 7/21/2022 3:17 PM View: Rome Limestone - P  
Clinch River LF Client: AEP Data: Clinch River

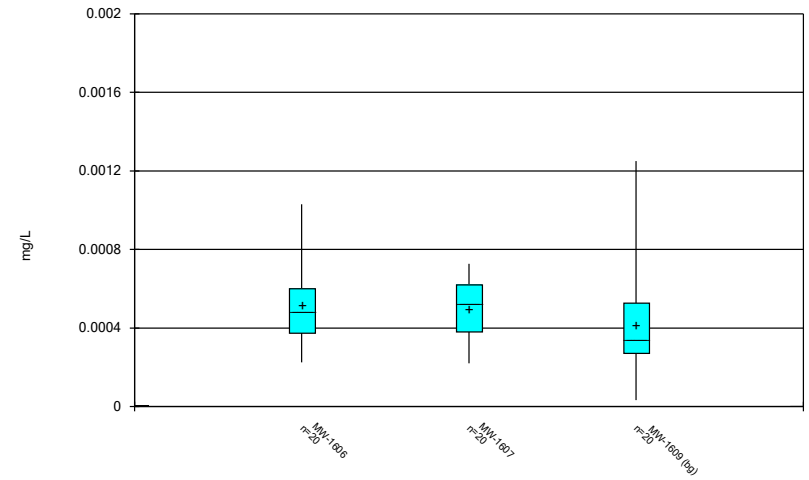


### Box & Whiskers Plot



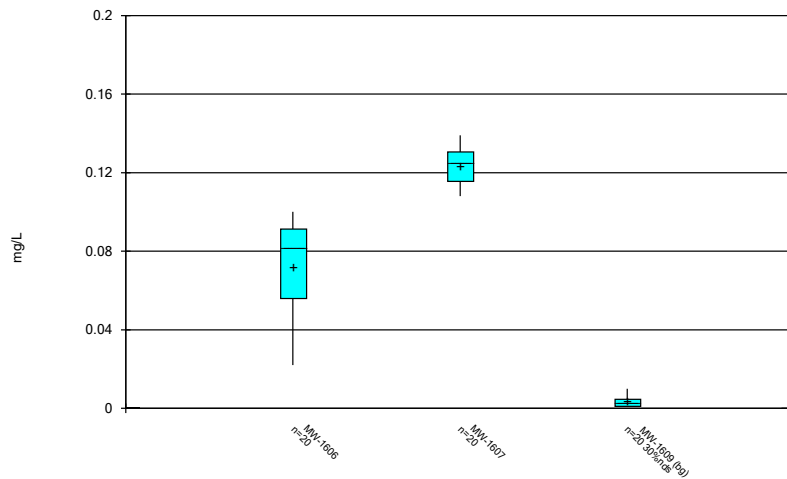
Constituent: Fluoride total Analysis Run 7/21/2022 3:18 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



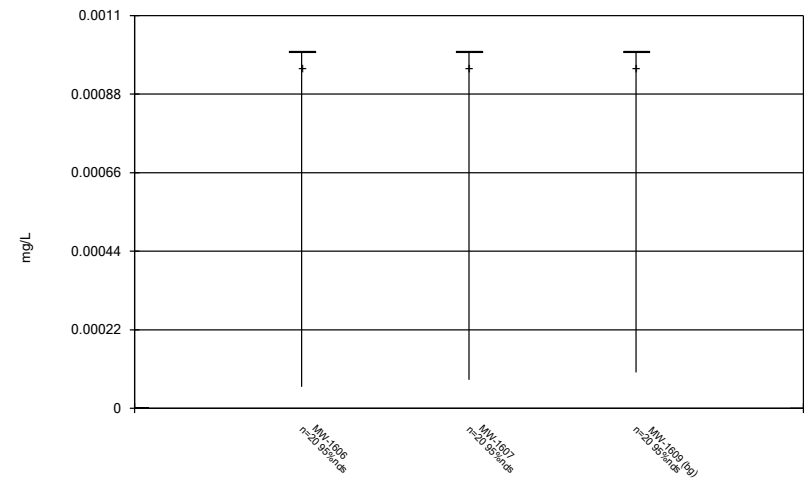
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



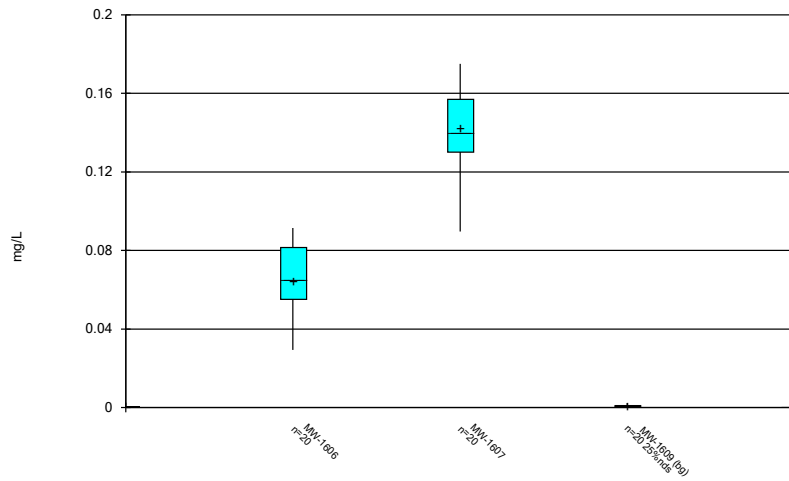
Constituent: Lithium total Analysis Run 7/21/2022 3:18 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



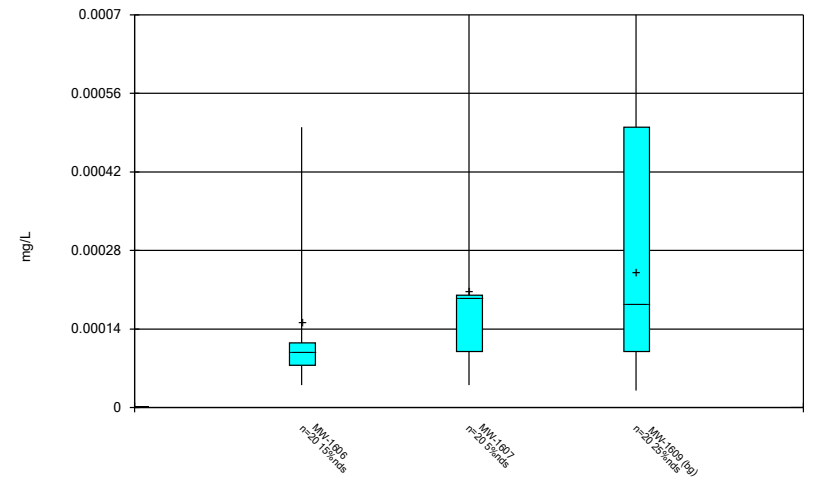
Constituent: Mercury total Analysis Run 7/21/2022 3:18 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



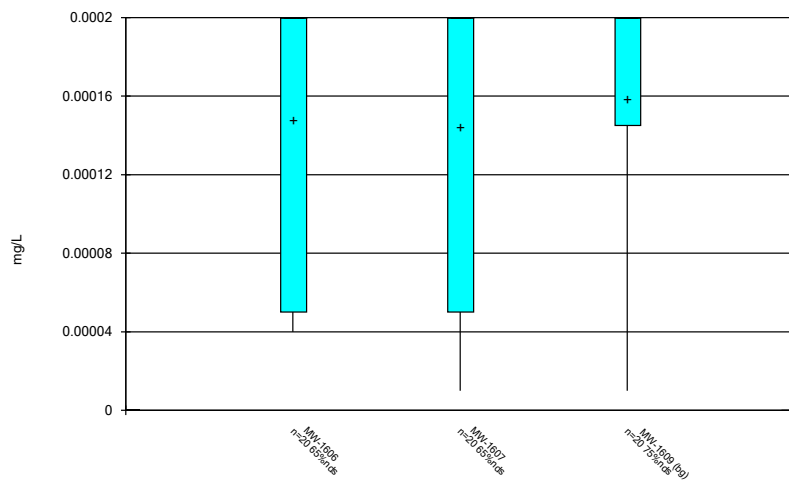
Constituent: Molybdenum total Analysis Run 7/21/2022 3:18 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot



Constituent: Selenium total Analysis Run 7/21/2022 3:18 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

Box & Whiskers Plot

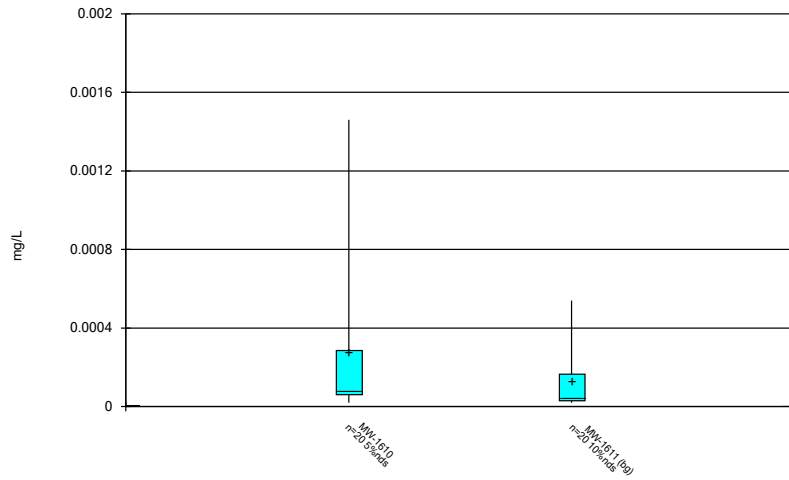


Constituent: Thallium total Analysis Run 7/21/2022 3:18 PM View: Rome Limestone - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

# Box Plots - Dumps Fault

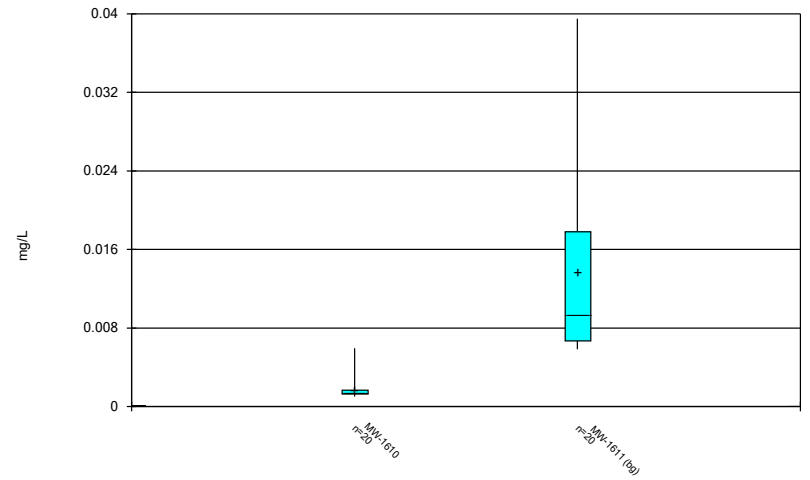
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### Box & Whiskers Plot



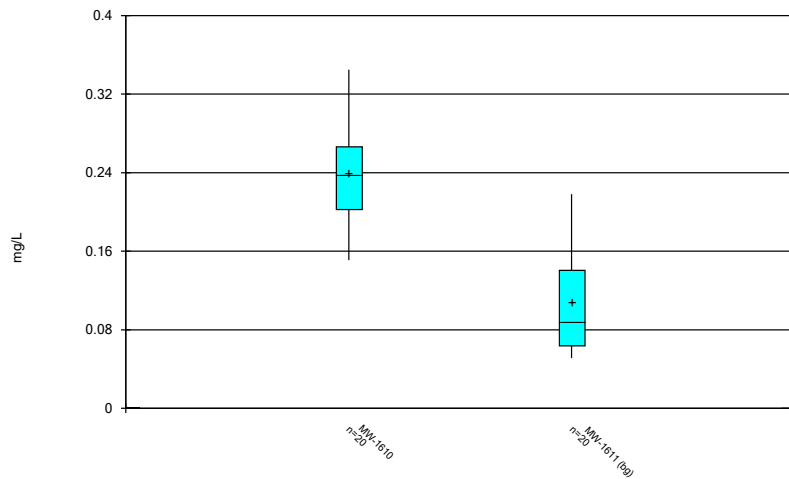
Constituent: Antimony total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



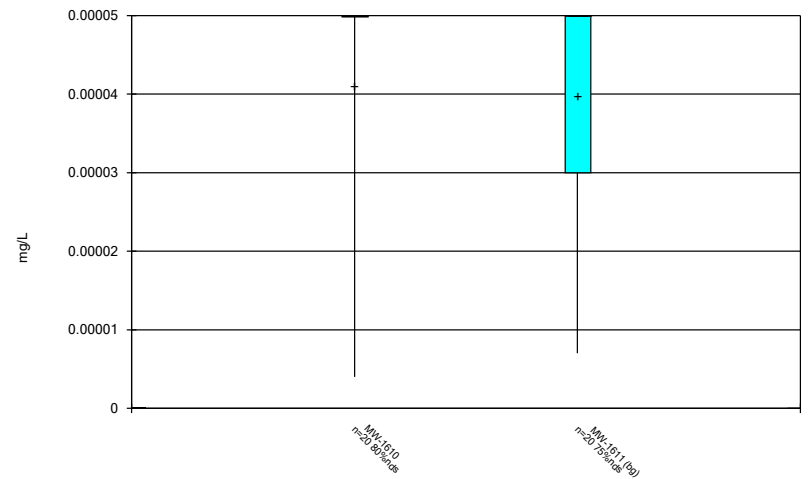
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



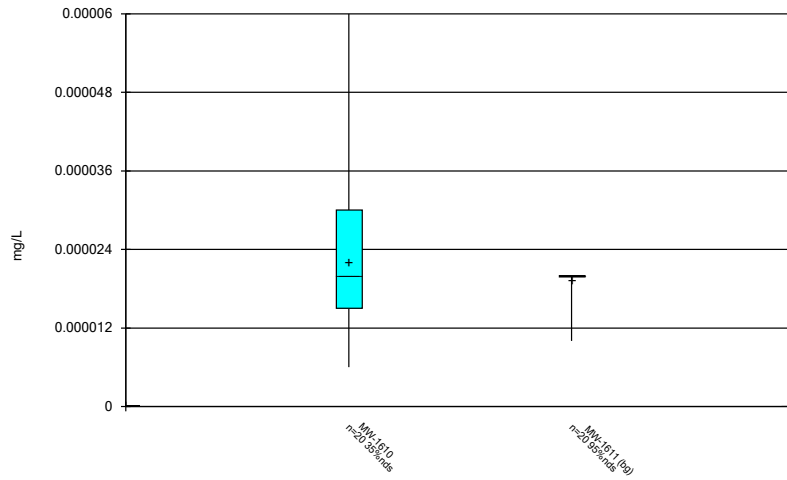
Constituent: Barium total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



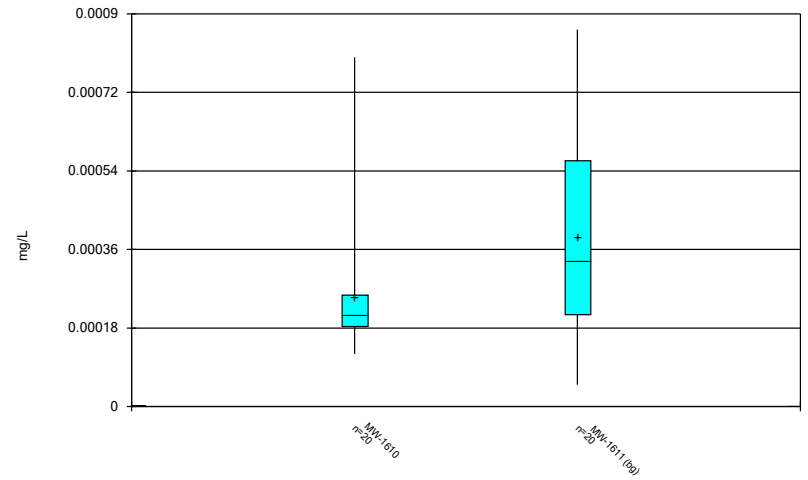
Constituent: Beryllium total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



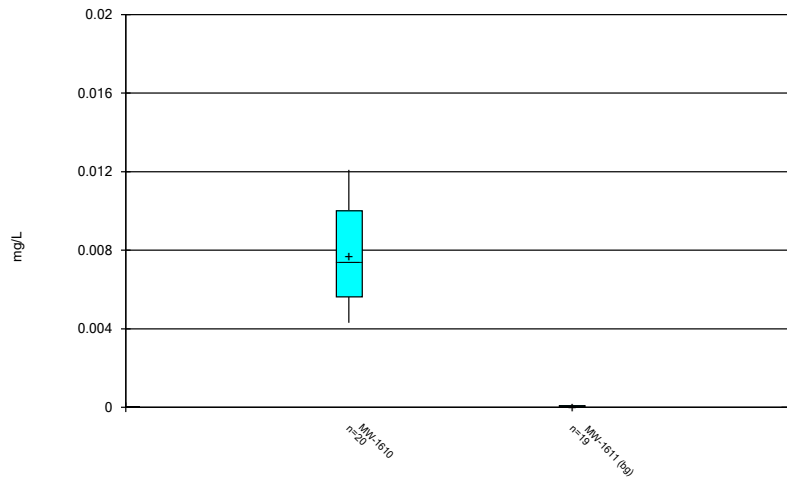
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



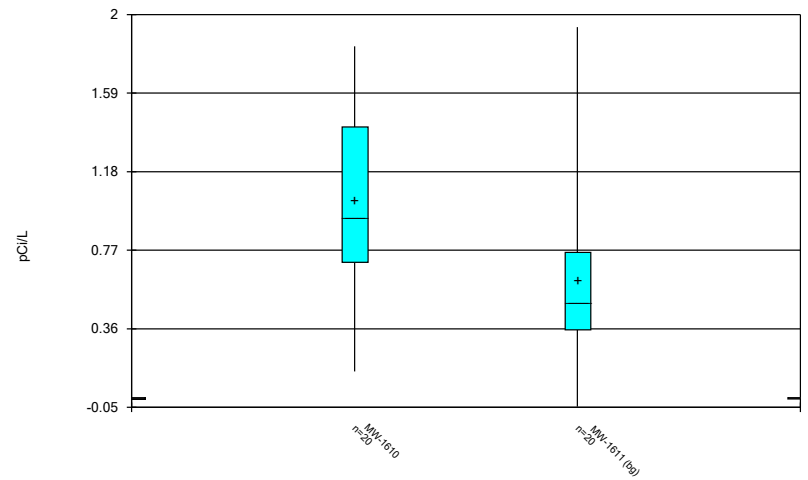
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Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



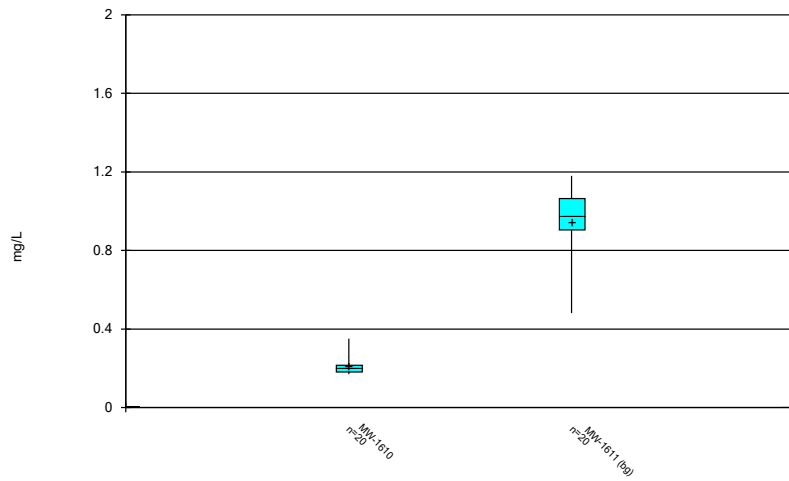
Constituent: Cobalt total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



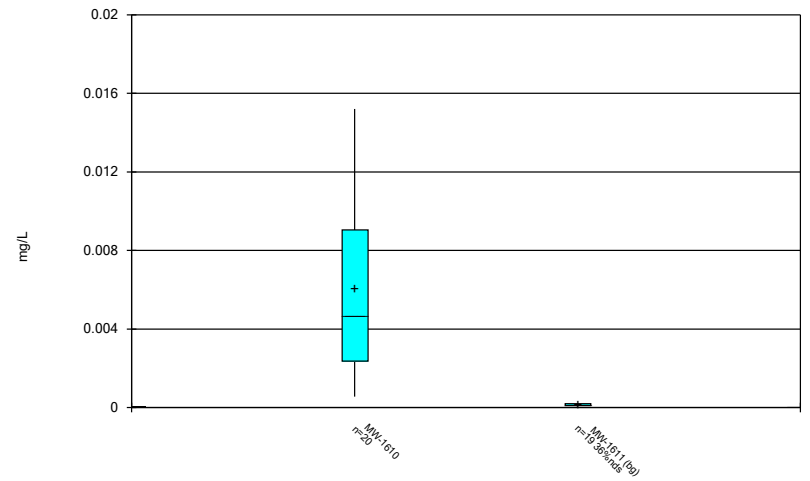
Constituent: Combined Radium 226 and 228 Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



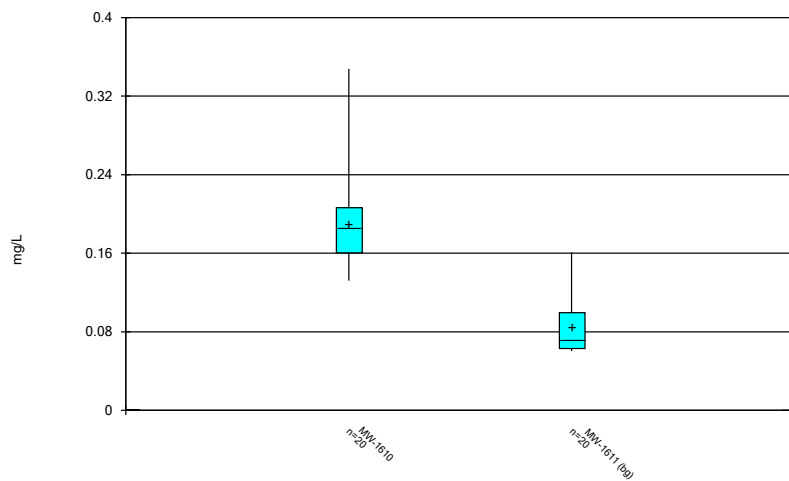
Constituent: Fluoride total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



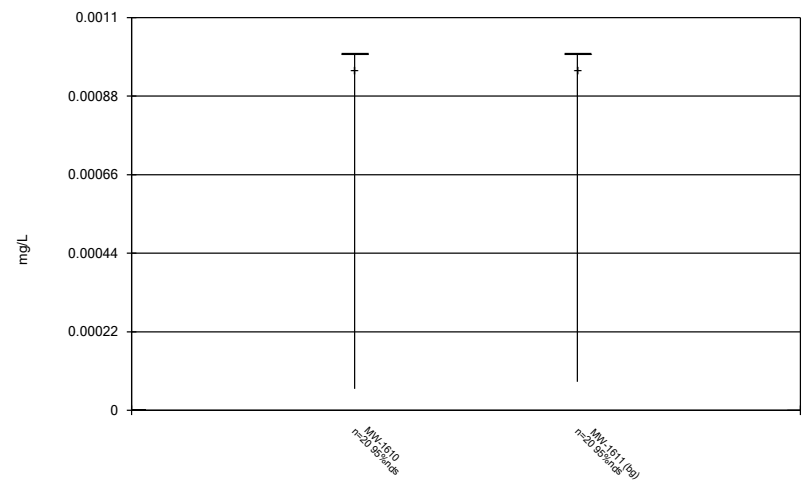
Constituent: Lead total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



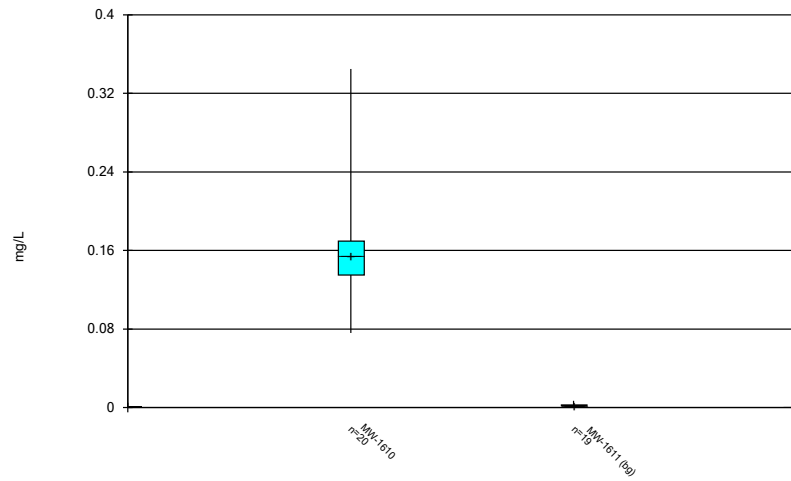
Constituent: Lithium total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



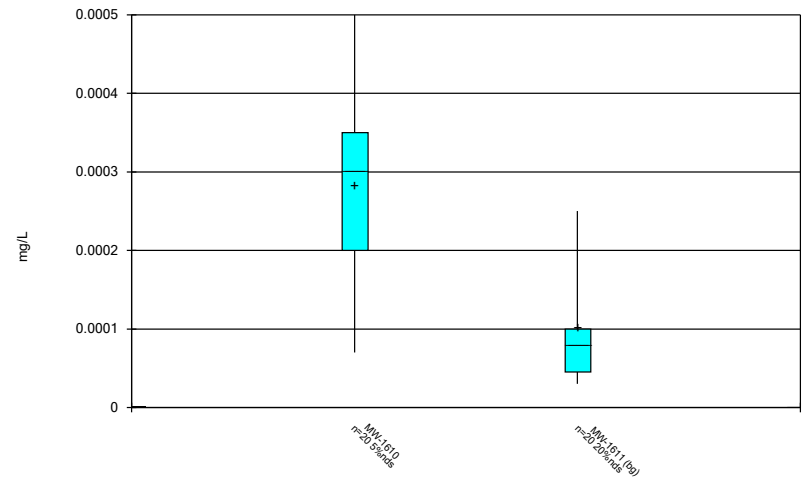
Constituent: Mercury total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



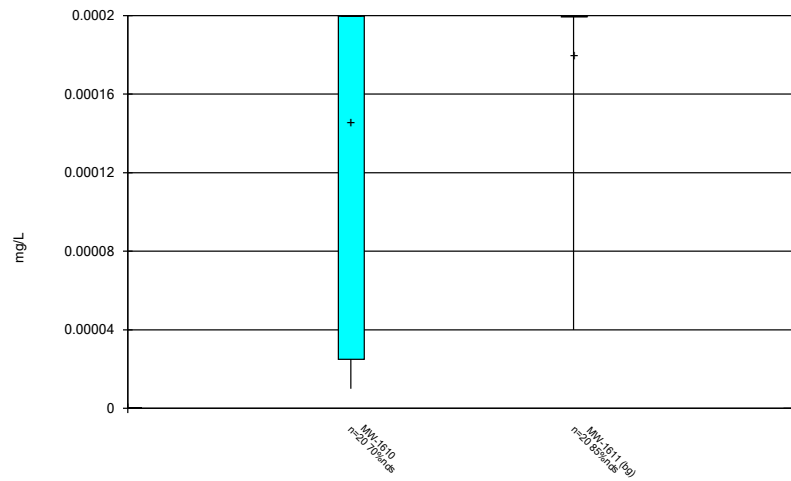
Constituent: Molybdenum total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



Constituent: Selenium total Analysis Run 7/21/2022 3:11 PM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Box & Whiskers Plot



Constituent: Thallium total Analysis Run 7/21/2022 3:11 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 7/21/2022, 2:57 PM

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No outliers were flagged.

# Outlier Summary - Rome Limestone

Clinch River LF Client: AEP Data: Clinch River Printed 7/21/2022, 3:20 PM

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No outliers were flagged.

# Outlier Summary - Dumps Fault

Clinch River LF Client: AEP Data: Clinch River Printed 7/21/2022, 3:12 PM

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	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 LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:49 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	n/a	0.0003862	n/a	n/a	n/a	54	-9.447	0.7777	1.852	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.0258	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Barium total (mg/L)	n/a	0.306	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Beryllium total (mg/L)	n/a	0.000066	n/a	n/a	n/a	54	n/a	n/a	61.11	n/a	n/a	0.06267	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00003	n/a	n/a	n/a	54	n/a	n/a	85.19	n/a	n/a	0.06267	NP Inter(NDs)
Chromium total (mg/L)	n/a	0.001218	n/a	n/a	n/a	54	-8.094	0.6772	0	None	ln(x)	0.05	Inter
Cobalt total (mg/L)	n/a	0.0004159	n/a	n/a	n/a	54	0.04677	0.01365	0	None	x^(1/3)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	2.746	n/a	n/a	n/a	54	0.8862	0.2518	0	None	x^(1/3)	0.05	Inter
Fluoride total (mg/L)	n/a	2.42	n/a	n/a	n/a	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(normality)
Lead total (mg/L)	n/a	0.0005623	n/a	n/a	n/a	54	0.04698	0.01741	18.52	Kaplan-Meier	x^(1/3)	0.05	Inter
Lithium total (mg/L)	n/a	0.118	n/a	n/a	n/a	54	n/a	n/a	1.852	n/a	n/a	0.06267	NP Inter(normality)
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	54	n/a	n/a	87.04	n/a	n/a	0.06267	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.01532	n/a	n/a	n/a	54	-5.853	0.8202	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0005	n/a	n/a	n/a	54	n/a	n/a	40.74	n/a	n/a	0.06267	NP Inter(normality)
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	54	n/a	n/a	74.07	n/a	n/a	0.06267	NP Inter(NDs)

# Tolerance Limits Summary Table - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:53 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	n/a	0.0001174	n/a	n/a	n/a	18	0.005925	0.002001	11.11	None	sqrt(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.00097	n/a	n/a	n/a	18	n/a	n/a	0	n/a	n/a	0.3972	NP Inter(normality)
Barium total (mg/L)	n/a	0.5258	n/a	n/a	n/a	18	0.3964	0.05273	0	None	No	0.05	Inter
Beryllium total (mg/L)	n/a	0.00005	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00004	n/a	n/a	n/a	18	n/a	n/a	22.22	n/a	n/a	0.3972	NP Inter(normality)
Chromium total (mg/L)	n/a	0.0003363	n/a	n/a	n/a	18	0.0001676	0.00006878	0	None	No	0.05	Inter
Cobalt total (mg/L)	n/a	0.001322	n/a	n/a	n/a	18	0.01437	0.008965	16.67	Kaplan-Meier	sqrt(x)	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	5.185	n/a	n/a	n/a	18	1.394	0.3598	0	None	sqrt(x)	0.05	Inter
Fluoride total (mg/L)	n/a	0.3478	n/a	n/a	n/a	18	0.2572	0.03691	0	None	No	0.05	Inter
Lead total (mg/L)	n/a	0.001297	n/a	n/a	n/a	18	0.02016	0.006466	0	None	sqrt(x)	0.05	Inter
Lithium total (mg/L)	n/a	0.01	n/a	n/a	n/a	18	n/a	n/a	33.33	n/a	n/a	0.3972	NP Inter(normality)
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.002442	n/a	n/a	n/a	18	0.02529	0.009835	27.78	Kaplan-Meier	sqrt(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0004087	n/a	n/a	n/a	18	0.007751	0.005082	22.22	Kaplan-Meier	sqrt(x)	0.05	Inter
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	18	n/a	n/a	72.22	n/a	n/a	0.3972	NP Inter(NDs)

# Tolerance Limits Summary Table - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 1/24/2022, 3:42 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	n/a	0.001115	n/a	n/a	n/a	18	-9.523	1.11	0	None	ln(x)	0.05	Inter
Arsenic total (mg/L)	n/a	0.04569	n/a	n/a	n/a	18	0.2341	0.05031	0	None	x^(1/3)	0.05	Inter
Barium total (mg/L)	n/a	0.2008	n/a	n/a	n/a	18	0.09569	0.04287	0	None	No	0.05	Inter
Beryllium total (mg/L)	n/a	0.00005	n/a	n/a	n/a	18	n/a	n/a	72.22	n/a	n/a	0.3972	NP Inter(NDs)
Cadmium total (mg/L)	n/a	0.00002	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Chromium total (mg/L)	n/a	0.0009625	n/a	n/a	n/a	18	0.000422	0.0002203	0	None	No	0.05	Inter
Cobalt total (mg/L)	n/a	0.0001438	n/a	n/a	n/a	17	0.00005629	0.00003521	0	None	No	0.05	Inter
Combined Radium 226 and 228 (pCi/L)	n/a	1.935	n/a	n/a	n/a	18	n/a	n/a	0	n/a	n/a	0.3972	NP Inter(normality)
Fluoride total (mg/L)	n/a	1.356	n/a	n/a	n/a	18	0.9283	0.1742	0	None	No	0.05	Inter
Lead total (mg/L)	n/a	0.0002117	n/a	n/a	n/a	17	0.00009664	0.00004628	29.41	Kaplan-Meier	No	0.05	Inter
Lithium total (mg/L)	n/a	0.1649	n/a	n/a	n/a	18	0.2912	0.04683	0	None	sqrt(x)	0.05	Inter
Mercury total (mg/L)	n/a	0.001	n/a	n/a	n/a	18	n/a	n/a	94.44	n/a	n/a	0.3972	NP Inter(NDs)
Molybdenum total (mg/L)	n/a	0.006125	n/a	n/a	n/a	17	-6.077	0.395	0	None	ln(x)	0.05	Inter
Selenium total (mg/L)	n/a	0.0003072	n/a	n/a	n/a	18	-9.559	0.5999	11.11	None	ln(x)	0.05	Inter
Thallium total (mg/L)	n/a	0.0002	n/a	n/a	n/a	18	n/a	n/a	83.33	n/a	n/a	0.3972	NP Inter(NDs)

FIGURE E.



<b>CLINCH RIVER GWPS - CHATTANOOGA SHALE</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR Rule Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.00039	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		0.0012	0.1
Cobalt, Total (mg/L)		0.006	0.00042	0.006
Combined Radium, Total (pCi/L)	5		2.75	5
Fluoride, Total (mg/L)	4		2.42	4
Lead, Total (mg/L)		0.015	0.00056	0.015
Lithium, Total (mg/L)		0.04	0.12	0.12
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.015	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*

<b>CLINCH RIVER GWPS - ROME LIMESTONE</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR Rule Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.00012	0.006
Arsenic, Total (mg/L)	0.01		0.00097	0.01
Barium, Total (mg/L)	2		0.53	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		0.00034	0.1
Cobalt, Total (mg/L)		0.006	0.0013	0.006
Combined Radium, Total (pCi/L)	5		5.19	5.19
Fluoride, Total (mg/L)	4		0.35	4
Lead, Total (mg/L)		0.015	0.0013	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	0.0024	0.1
Selenium, Total (mg/L)	0.05		0.00041	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*

<b>CLINCH RIVER GWPS - DUMPS FAULT</b>				
<b>Constituent Name</b>	<b>MCL</b>	<b>CCR Rule Specified</b>	<b>Background Limit</b>	<b>GWPS</b>
Antimony, Total (mg/L)	0.006		0.0011	0.006
Arsenic, Total (mg/L)	0.01		0.046	0.046
Barium, Total (mg/L)	2		0.2	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		0.00096	0.1
Cobalt, Total (mg/L)		0.006	0.00014	0.006
Combined Radium, Total (pCi/L)	5		1.94	5
Fluoride, Total (mg/L)	4		1.36	4
Lead, Total (mg/L)		0.015	0.00021	0.015
Lithium, Total (mg/L)		0.04	0.16	0.16
Mercury, Total (mg/L)	0.002		0.001	0.002
Molybdenum, Total (mg/L)		0.1	0.0061	0.1
Selenium, Total (mg/L)	0.05		0.00031	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 Intervals - Chattanooga Shale - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 8:11 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Barium total (mg/L)	MW-1603	2.778	2.138	2	Yes	20	2.458	0.5628	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1604	3.267	3.099	2	Yes	20	3.183	0.1484	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1612	2.35	2.032	2	Yes	19	2.191	0.272	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1605	0.2017	0.1877	0.118	Yes	20	0.1947	0.01229	0	None	No	0.01	Param.

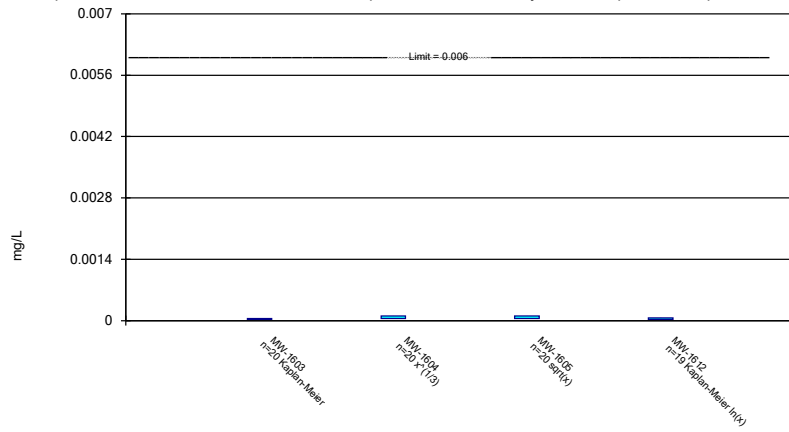
# Confidence Intervals - Chattanooga Shale - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 8:11 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	0.00004897	0.00002323	0.006	No	20	0.000064	0.00002854	20	Kaplan-Meier	No	0.01	Param.
Antimony total (mg/L)	MW-1604	0.0001087	0.00004463	0.006	No	20	0.0000875	0.00008777	15	None	x^(1/3)	0.01	Param.
Antimony total (mg/L)	MW-1605	0.0001075	0.00004593	0.006	No	20	0.000083	0.0000653	10	None	sqrt(x)	0.01	Param.
Antimony total (mg/L)	MW-1612	0.00006096	0.00002333	0.006	No	19	0.00007158	0.00006702	15.79	Kaplan-Meier	ln(x)	0.01	Param.
Arsenic total (mg/L)	MW-1603	0.002768	0.002064	0.026	No	20	0.002416	0.0006203	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1604	0.002741	0.001742	0.026	No	20	0.002297	0.0009587	0	None	sqrt(x)	0.01	Param.
Arsenic total (mg/L)	MW-1605	0.004305	0.002384	0.026	No	20	0.003345	0.001691	0	None	No	0.01	Param.
Arsenic total (mg/L)	MW-1612	0.001258	0.0005311	0.026	No	19	0.001085	0.0009474	0	None	ln(x)	0.01	Param.
<b>Barium total (mg/L)</b>	<b>MW-1603</b>	<b>2.778</b>	<b>2.138</b>	<b>2</b>	<b>Yes</b>	<b>20</b>	<b>2.458</b>	<b>0.5628</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
<b>Barium total (mg/L)</b>	<b>MW-1604</b>	<b>3.267</b>	<b>3.099</b>	<b>2</b>	<b>Yes</b>	<b>20</b>	<b>3.183</b>	<b>0.1484</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Barium total (mg/L)	MW-1605	1.86	1.323	2	No	20	1.592	0.4728	0	None	No	0.01	Param.
<b>Barium total (mg/L)</b>	<b>MW-1612</b>	<b>2.35</b>	<b>2.032</b>	<b>2</b>	<b>Yes</b>	<b>19</b>	<b>2.191</b>	<b>0.272</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Beryllium total (mg/L)	MW-1603	0.00005	0.00001	0.004	No	20	0.0000439	0.0000149	85	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1604	0.00005	0.000007	0.004	No	20	0.0000456	0.00001355	90	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1605	0.00005	0.00001	0.004	No	20	0.00004345	0.00001603	85	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1612	0.00005	0.000045	0.004	No	19	0.00004295	0.00001606	78.95	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1605	0.00002	0.00001	0.005	No	20	0.0000195	0.00002236	90	None	No	0.01	NP (NDs)
Chromium total (mg/L)	MW-1603	0.0002285	0.0001618	0.1	No	20	0.0001952	0.00005868	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1604	0.0002291	0.0001394	0.1	No	20	0.0001843	0.00007902	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1605	0.0002778	0.0001755	0.1	No	20	0.0002267	0.00008999	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1612	0.000218	0.00015	0.1	No	19	0.000195	0.00007645	0	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1603	0.0005399	0.0002869	0.006	No	20	0.0004134	0.0002228	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1604	0.0006881	0.0003996	0.006	No	20	0.0005439	0.0002541	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1605	0.0002779	0.0001202	0.006	No	20	0.0001991	0.0001388	0	None	No	0.01	Param.
Cobalt total (mg/L)	MW-1612	0.0002158	0.0001275	0.006	No	19	0.0001787	0.00008185	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1603	1.614	0.8234	5	No	20	1.219	0.6965	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1604	1.552	0.9741	5	No	20	1.263	0.5088	0	None	No	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1605	1.713	0.868	5	No	20	1.558	1.341	0	None	No	0.01	NP (normality)
Combined Radium 226 and 228 (pCi/L)	MW-1612	2.19	1.319	5	No	19	1.754	0.7432	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1603	0.1397	0.1107	4	No	20	0.126	0.02664	0	None	sqrt(x)	0.01	Param.
Fluoride total (mg/L)	MW-1604	0.2865	0.2345	4	No	20	0.2605	0.04571	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1605	0.3729	0.3351	4	No	20	0.354	0.03331	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1612	0.1871	0.1455	4	No	19	0.1663	0.03547	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1603	0.0002	0.000021	0.015	No	20	0.0001453	0.00008593	70	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1604	0.0002	0.000047	0.015	No	20	0.0001417	0.00008258	65	None	No	0.01	NP (NDs)
Lead total (mg/L)	MW-1605	0.0002	0.00005	0.015	No	20	0.0001243	0.00007853	50	None	No	0.01	NP (normality)
Lead total (mg/L)	MW-1612	0.0002	0.00004	0.015	No	19	0.0001583	0.00008483	63.16	None	No	0.01	NP (NDs)
Lithium total (mg/L)	MW-1603	0.07938	0.05823	0.118	No	20	0.06881	0.01862	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1604	0.08219	0.0741	0.118	No	20	0.07815	0.007115	0	None	No	0.01	Param.
<b>Lithium total (mg/L)</b>	<b>MW-1605</b>	<b>0.2017</b>	<b>0.1877</b>	<b>0.118</b>	<b>Yes</b>	<b>20</b>	<b>0.1947</b>	<b>0.01229</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Lithium total (mg/L)	MW-1612	0.1274	0.1107	0.118	No	19	0.1168	0.02039	5.263	None	x^3	0.01	Param.
Mercury total (mg/L)	MW-1603	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1604	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1612	0.001	0.00006	0.002	No	19	0.0009505	0.0002157	94.74	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1603	0.00151	0.0005	0.1	No	20	0.001086	0.001061	0	None	No	0.01	NP (normality)
Molybdenum total (mg/L)	MW-1604	0.0008433	0.0002932	0.1	No	20	0.0007265	0.0004677	20	Kaplan-Meier	No	0.01	Param.
Molybdenum total (mg/L)	MW-1605	0.003555	0.001176	0.1	No	20	0.002678	0.00244	0	None	sqrt(x)	0.01	Param.
Molybdenum total (mg/L)	MW-1612	0.001318	0.0005281	0.1	No	19	0.001002	0.0008139	5.263	None	sqrt(x)	0.01	Param.
Selenium total (mg/L)	MW-1603	0.0001	0.00007	0.05	No	20	0.000162	0.0001743	20	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1604	0.0005	0.00005	0.05	No	20	0.00023	0.0002264	40	None	No	0.01	NP (normality)
Selenium total (mg/L)	MW-1605	0.0005	0.00005	0.05	No	20	0.0003005	0.0002264	55	None	No	0.01	NP (NDs)
Selenium total (mg/L)	MW-1612	0.0005	0.00004	0.05	No	19	0.0002847	0.0002336	52.63	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1603	0.0002	0.00002	0.002	No	20	0.000153	0.00008355	75	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1604	0.0002	0.00002	0.002	No	20	0.0001625	0.00007697	80	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1605	0.0002	0.00002	0.002	No	20	0.000163	0.00007596	80	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1612	0.0002	0.00003	0.002	No	19	0.0001611	0.0000776	78.95	None	No	0.01	NP (NDs)

### Parametric Confidence Interval

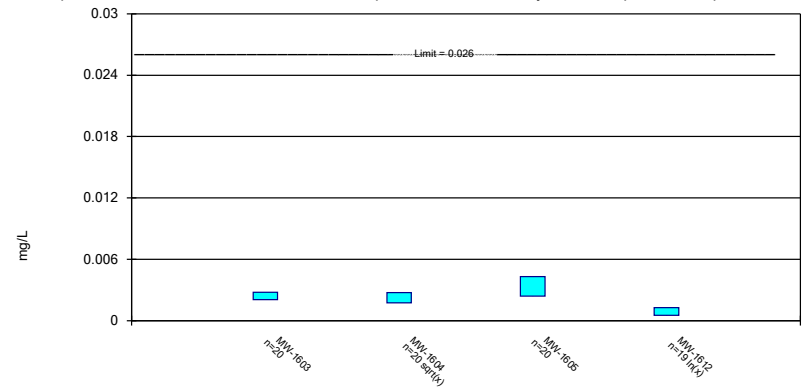
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

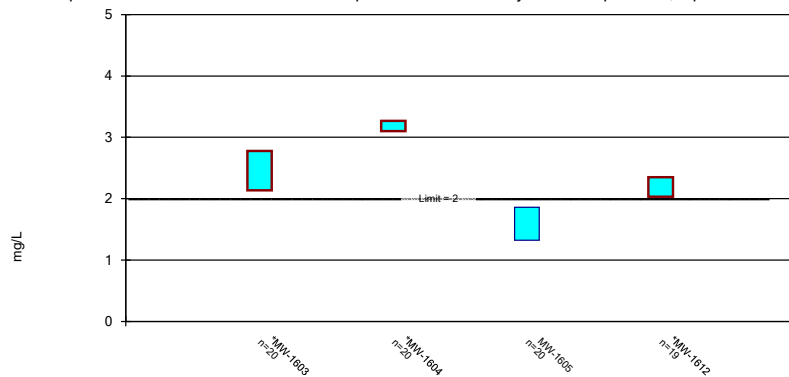
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Arsenic total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

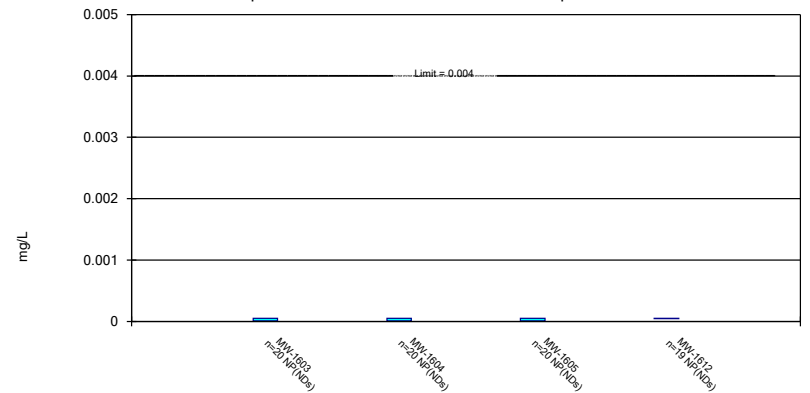
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

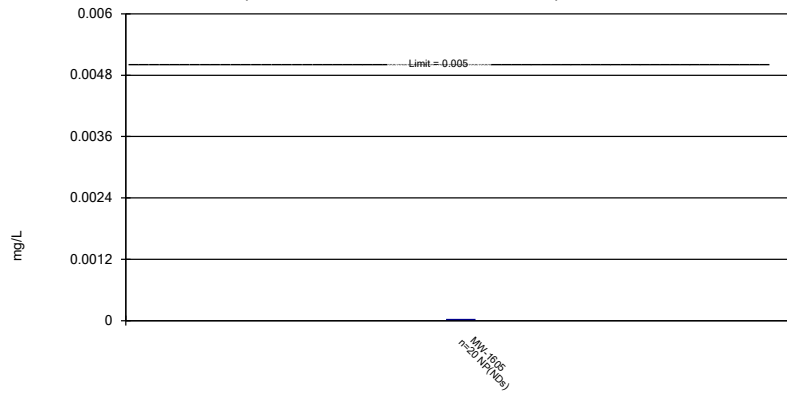
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

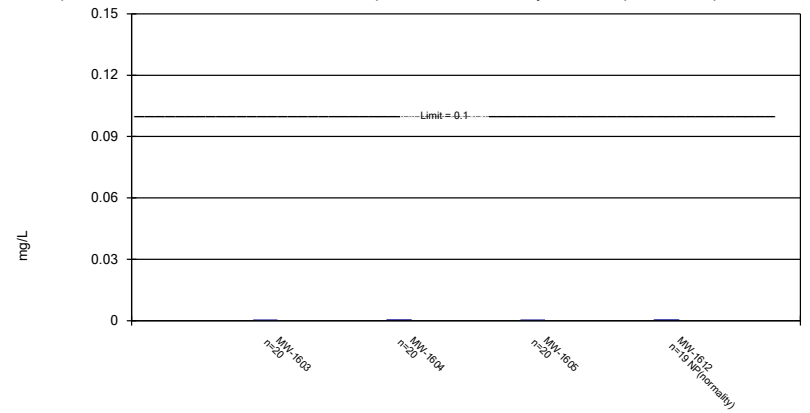
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

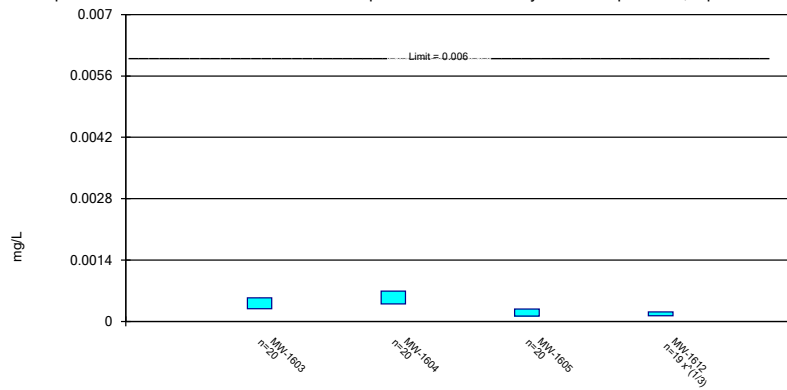
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

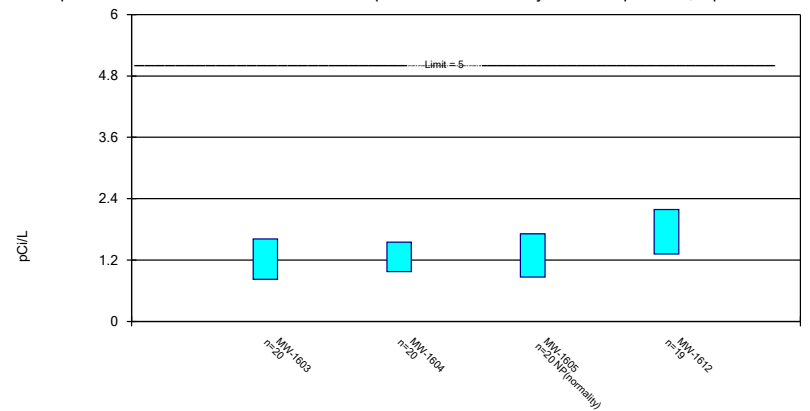
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 8/9/2022 8:09 AM 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.

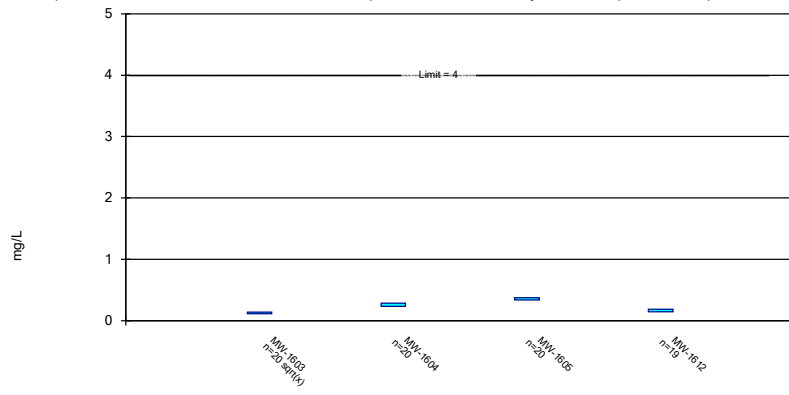


Constituent: Combined Radium 226 and 228 Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River



### Parametric Confidence Interval

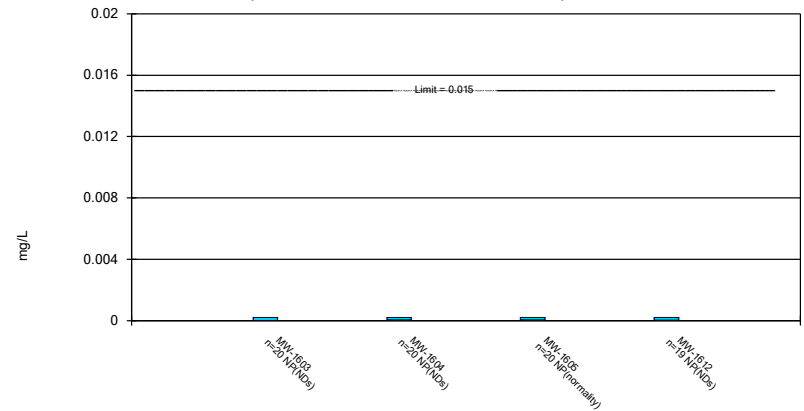
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

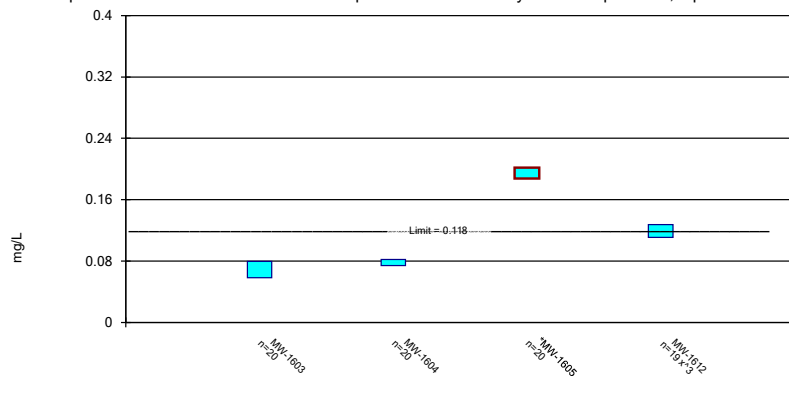
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Lead total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence Int  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

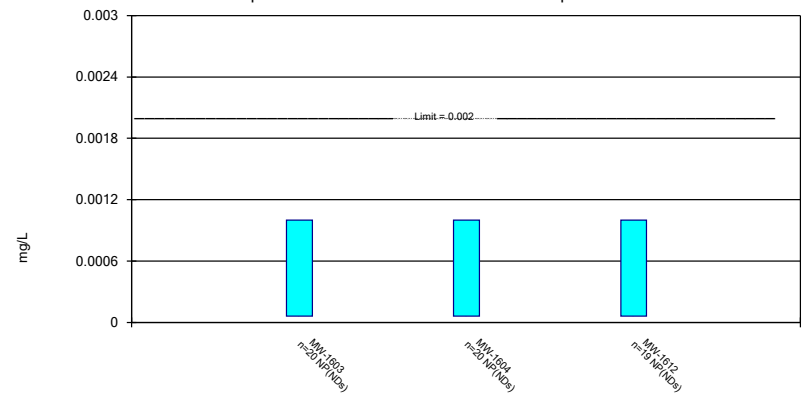
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

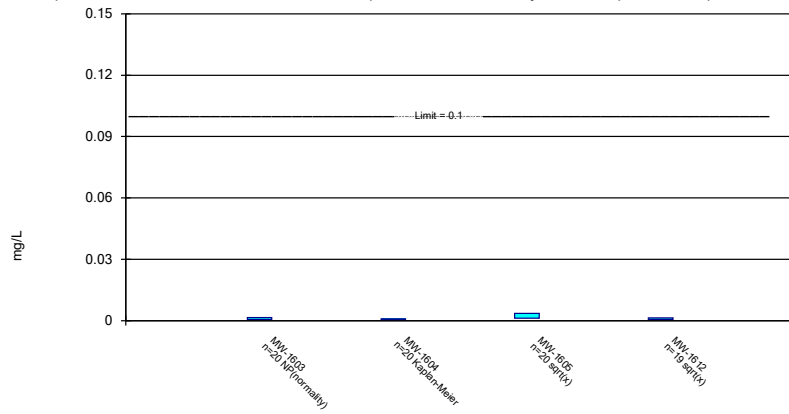
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

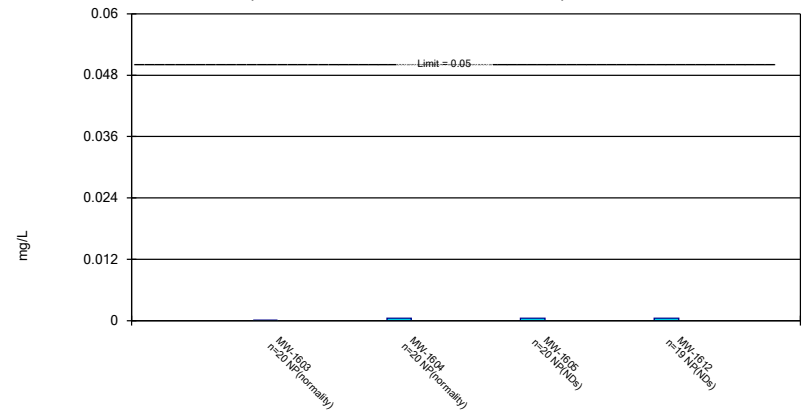
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confid  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

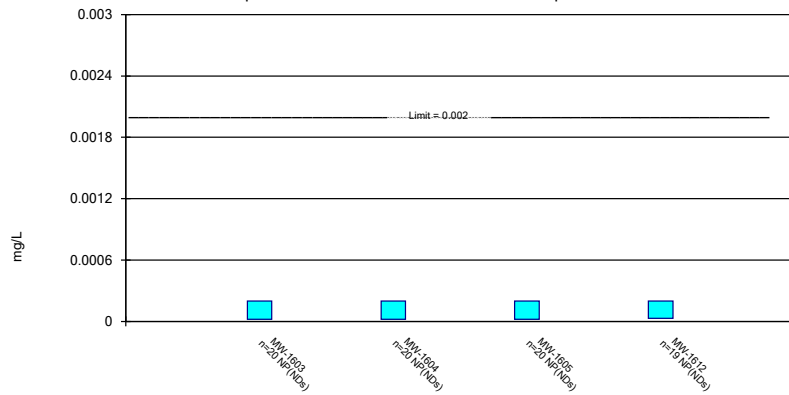
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Selenium total Analysis Run 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confid  
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 8/9/2022 8:09 AM View: Chattanooga Shale - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

# Confidence Intervals - Rome Limestone - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 7/21/2022, 3:23 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-1607	0.01069	0.008304	0.006	Yes	20	0.009499	0.002103	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1606	0.0862	0.05834	0.04	Yes	20	0.07227	0.02453	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1607	0.1287	0.1183	0.04	Yes	20	0.1235	0.009082	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1607	0.1533	0.1308	0.1	Yes	20	0.142	0.01981	0	None	No	0.01	Param.

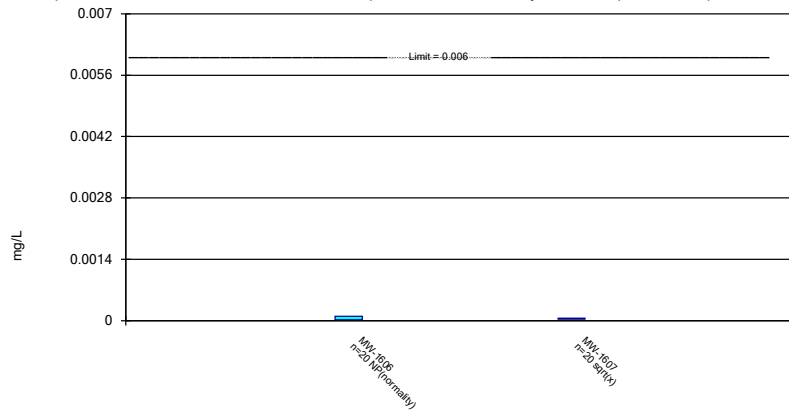
# Confidence Intervals - Rome Limestone - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 7/21/2022, 3:23 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	20	0.000057	0.00003658	40	None	No	0.01	NP (normality)
Antimony total (mg/L)	MW-1607	0.00005832	0.00003472	0.006	No	20	0.000048	0.00002262	5	None	sqrt(x)	0.01	Param.
Arsenic total (mg/L)	MW-1606	0.00837	0.00689	0.01	No	20	0.008116	0.002453	0	None	No	0.01	NP (normality)
Arsenic total (mg/L)	MW-1607	0.00146	0.00098	0.01	No	20	0.001523	0.001163	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1606	0.1181	0.1071	2	No	20	0.1126	0.009649	0	None	No	0.01	Param.
Barium total (mg/L)	MW-1607	0.0747	0.0682	2	No	20	0.07504	0.01671	0	None	No	0.01	NP (normality)
Beryllium total (mg/L)	MW-1606	0.00005	0.000007	0.004	No	20	0.0000313	0.00002139	55	None	No	0.01	NP (NDs)
Beryllium total (mg/L)	MW-1607	0.00005	0.000005	0.004	No	20	0.00004775	0.00001006	95	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1606	0.00002	0.00001	0.005	No	20	0.00001475	0.000008626	40	None	No	0.01	NP (normality)
Cadmium total (mg/L)	MW-1607	0.0001622	0.0001013	0.005	No	20	0.0001318	0.00005366	0	None	No	0.01	Param.
Chromium total (mg/L)	MW-1606	0.000267	0.0001682	0.1	No	20	0.0002315	0.0001155	0	None	ln(x)	0.01	Param.
Chromium total (mg/L)	MW-1607	0.000212	0.0001	0.1	No	20	0.0002052	0.0001618	10	None	No	0.01	NP (normality)
Cobalt total (mg/L)	MW-1606	0.005443	0.004266	0.006	No	20	0.004855	0.001037	0	None	No	0.01	Param.
<b>Cobalt total (mg/L)</b>	<b>MW-1607</b>	<b>0.01069</b>	<b>0.008304</b>	<b>0.006</b>	<b>Yes</b>	<b>20</b>	<b>0.009499</b>	<b>0.002103</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Combined Radium 226 and 228 (pCi/L)	MW-1606	2.338	1.283	5.19	No	20	1.923	1.198	0	None	x^(1/3)	0.01	Param.
Combined Radium 226 and 228 (pCi/L)	MW-1607	1.356	0.7228	5.19	No	20	1.04	0.5576	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1606	0.2257	0.1823	4	No	20	0.204	0.03817	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1607	0.239	0.211	4	No	20	0.225	0.0246	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1606	0.0006403	0.0003923	0.015	No	20	0.0005163	0.0002183	0	None	No	0.01	Param.
Lead total (mg/L)	MW-1607	0.0005902	0.0004073	0.015	No	20	0.0004988	0.000161	0	None	No	0.01	Param.
<b>Lithium total (mg/L)</b>	<b>MW-1606</b>	<b>0.0862</b>	<b>0.05834</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>0.07227</b>	<b>0.02453</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
<b>Lithium total (mg/L)</b>	<b>MW-1607</b>	<b>0.1287</b>	<b>0.1183</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>0.1235</b>	<b>0.009082</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Mercury total (mg/L)	MW-1606	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
Mercury total (mg/L)	MW-1607	0.001	0.00008	0.002	No	20	0.000954	0.0002057	95	None	No	0.01	NP (NDs)
Molybdenum total (mg/L)	MW-1606	0.07498	0.05416	0.1	No	20	0.06457	0.01834	0	None	No	0.01	Param.
<b>Molybdenum total (mg/L)</b>	<b>MW-1607</b>	<b>0.1533</b>	<b>0.1308</b>	<b>0.1</b>	<b>Yes</b>	<b>20</b>	<b>0.142</b>	<b>0.01981</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Selenium total (mg/L)	MW-1606	0.0001402	0.00007466	0.05	No	20	0.0001145	0.00006747	15	None	x^(1/3)	0.01	Param.
Selenium total (mg/L)	MW-1607	0.0002488	0.000114	0.05	No	20	0.000194	0.0001466	5	None	sqrt(x)	0.01	Param.
Thallium total (mg/L)	MW-1606	0.0002	0.00005	0.002	No	20	0.000148	0.00007374	65	None	No	0.01	NP (NDs)
Thallium total (mg/L)	MW-1607	0.0002	0.00005	0.002	No	20	0.000144	0.00008022	65	None	No	0.01	NP (NDs)

### Parametric and Non-Parametric (NP) Confidence Interval

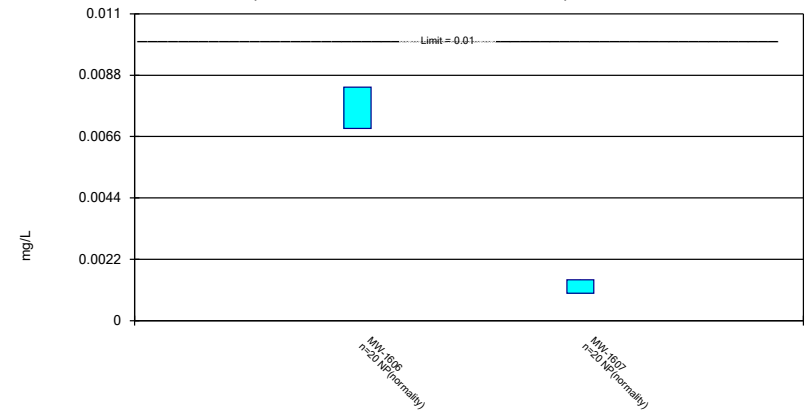
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 7/21/2022 3:22 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

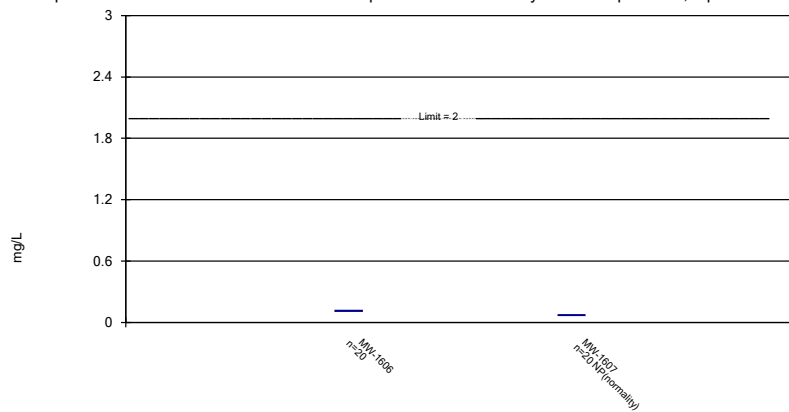
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic total Analysis Run 7/21/2022 3:22 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

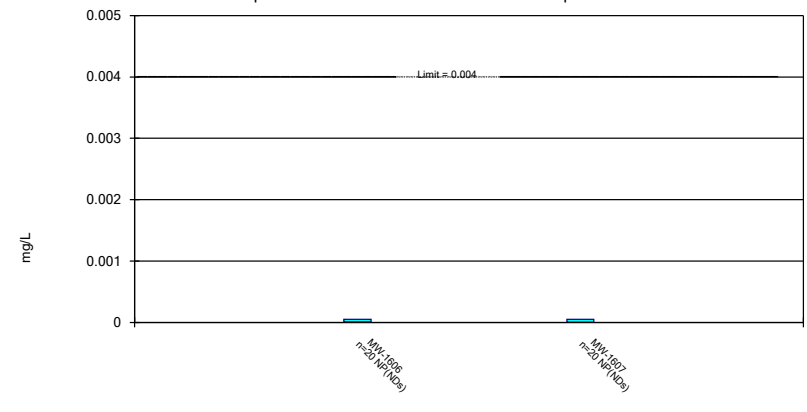
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 7/21/2022 3:22 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

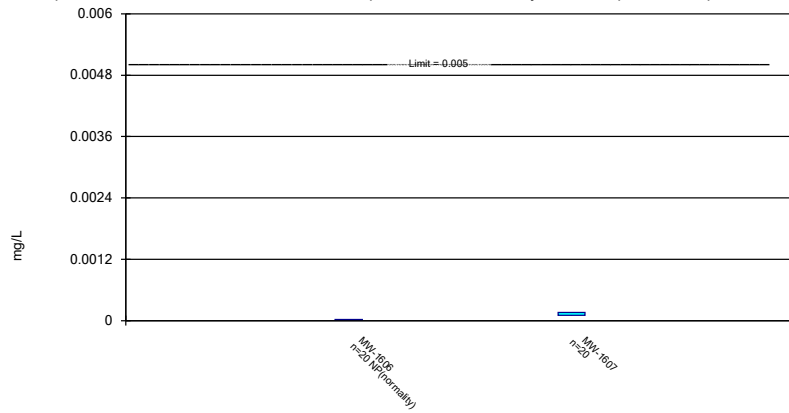
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 7/21/2022 3:22 PM View: Rome Limestone - Pond 1 Confidence In Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

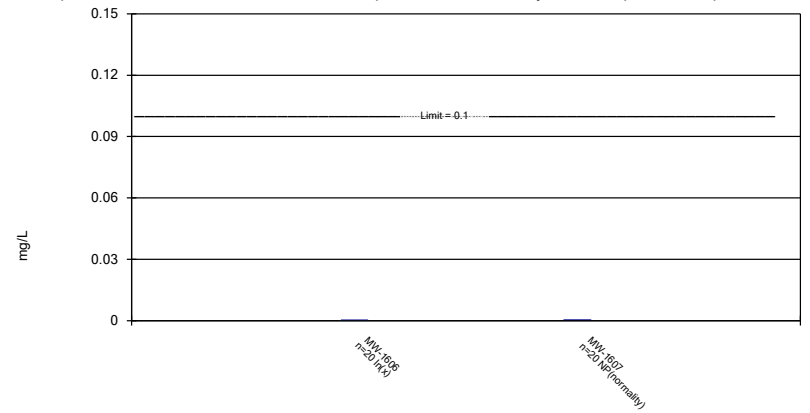
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cadmium total Analysis Run 7/21/2022 3:22 PM View: Rome Limestone - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

### Parametric and Non-Parametric (NP) Confidence Interval

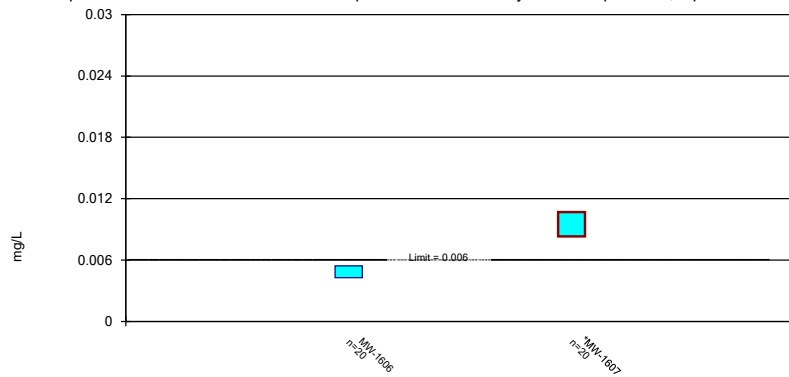
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chromium total Analysis Run 7/21/2022 3:22 PM View: Rome Limestone - Pond 1 Confidence Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

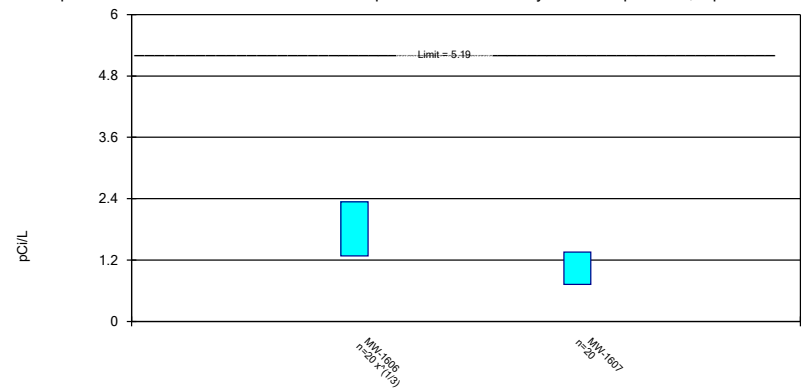
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 7/21/2022 3:22 PM View: Rome Limestone - Pond 1 Confidence Int Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

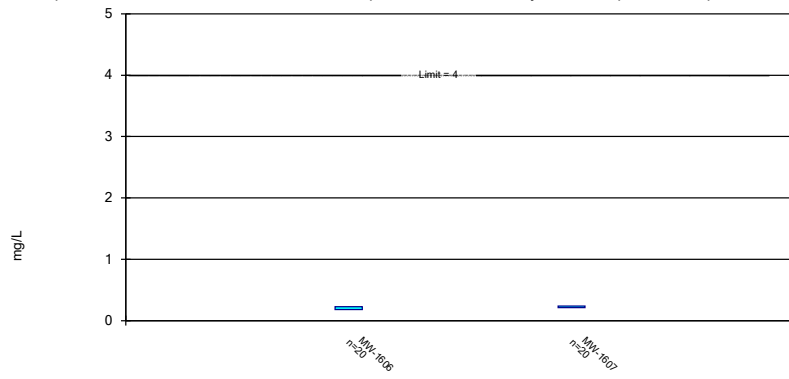
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 7/21/2022 3:23 PM View: Rome Limestone - P Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

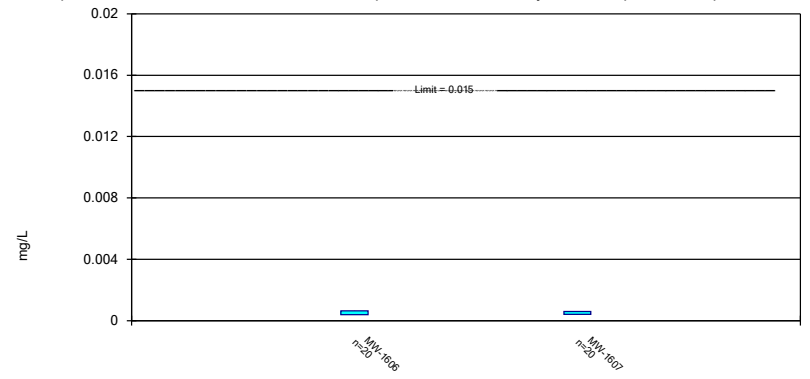
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride total Analysis Run 7/21/2022 3:23 PM View: Rome Limestone - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

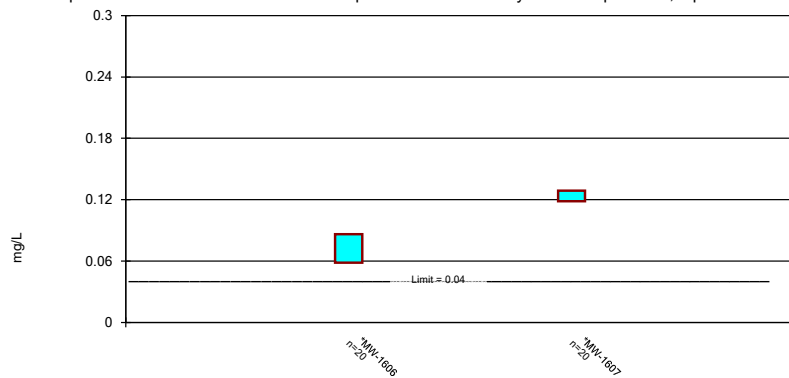
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 7/21/2022 3:23 PM View: Rome Limestone - Pond 1 Confidence Inter  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

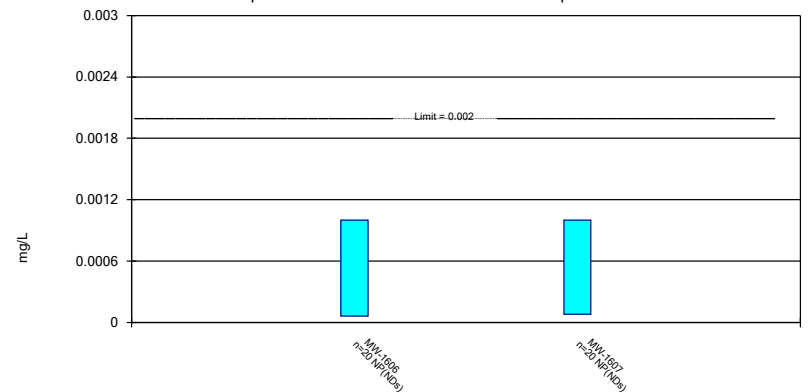
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 7/21/2022 3:23 PM View: Rome Limestone - Pond 1 Confidence In  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

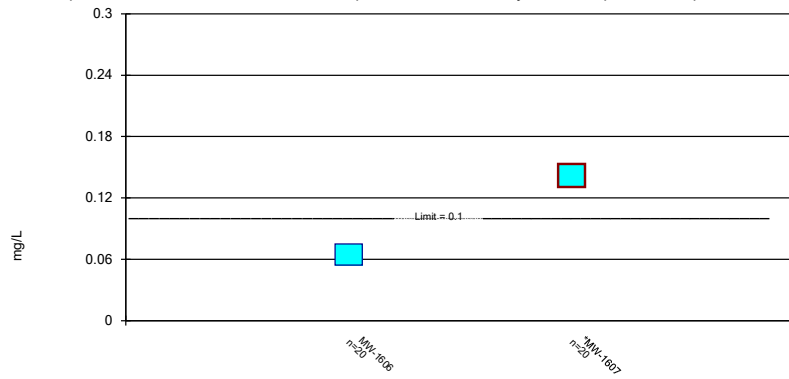
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 7/21/2022 3:23 PM View: Rome Limestone - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

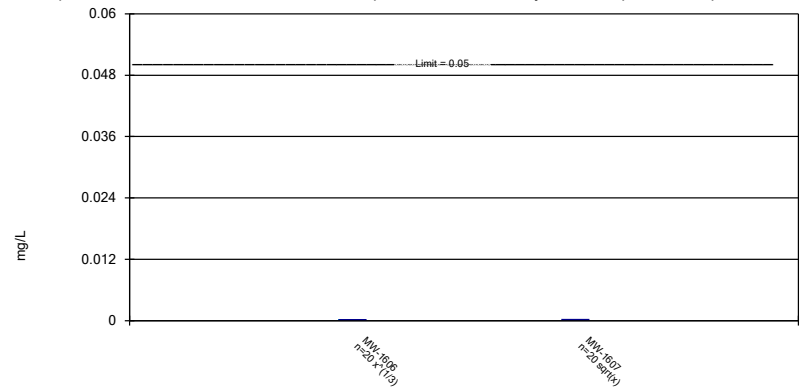
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 7/21/2022 3:23 PM View: Rome Limestone - Pond 1 Confidence  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

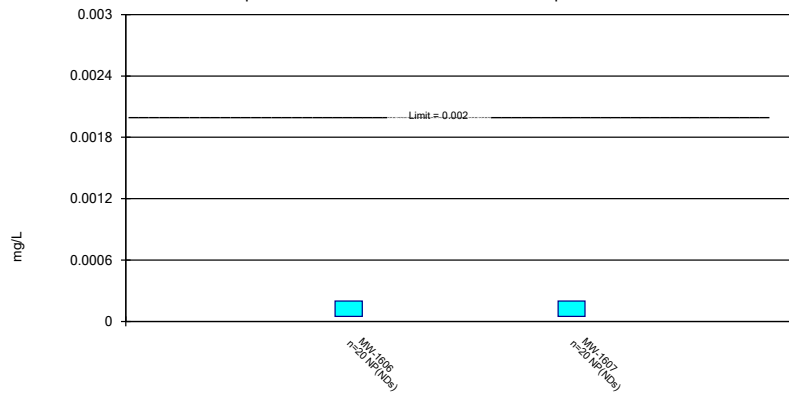
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 7/21/2022 3:23 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 7/21/2022 3:23 PM View: Rome Limestone - Pond 1 Confidence I  
Clinch River LF Client: AEP Data: Clinch River



# Confidence Intervals - Dumps Fault - Significant Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 9:10 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt total (mg/L)	MW-1610	0.009093	0.006366	0.006	Yes	20	0.00773	0.002401	0	None	No	0.01	Param.
Molybdenum total (mg/L)	MW-1610	0.1769	0.122	0.1	Yes	20	0.1547	0.05485	0	None	ln(x)	0.01	Param.

# Confidence Intervals - Dumps Fault - All Results

Clinch River LF Client: AEP Data: Clinch River Printed 8/9/2022, 9:10 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Antimony total (mg/L)	MW-1610	0.0002369	0.0000526	0.006	No	20	0.000275	0.0004363	5	None	ln(x)	0.01	Param.
Arsenic total (mg/L)	MW-1610	0.00167	0.00124	0.046	No	20	0.001665	0.001042	0	None	No	0.01	NP (normality)
Barium total (mg/L)	MW-1610	0.2666	0.2129	2	No	20	0.2398	0.04721	0	None	No	0.01	Param.
Beryllium total (mg/L)	MW-1610	0.00005	0.000007	0.004	No	20	0.00004095	0.00001858	80	None	No	0.01	NP (NDs)
Cadmium total (mg/L)	MW-1610	0.00003	0.000008	0.005	No	20	0.00001855	0.00001408	35	None	No	0.01	NP (normality)
Chromium total (mg/L)	MW-1610	0.000262	0.000174	0.1	No	20	0.000251	0.0001499	0	None	No	0.01	NP (normality)
<b>Cobalt total (mg/L)</b>	<b>MW-1610</b>	<b>0.009093</b>	<b>0.006366</b>	<b>0.006</b>	<b>Yes</b>	<b>20</b>	<b>0.00773</b>	<b>0.002401</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Combined Radium 226 and 228 (pCi/L)	MW-1610	1.315	0.7461	5	No	20	1.03	0.5007	0	None	No	0.01	Param.
Fluoride total (mg/L)	MW-1610	0.22	0.18	4	No	20	0.2095	0.04148	0	None	No	0.01	NP (normality)
Lead total (mg/L)	MW-1610	0.008704	0.003463	0.015	No	20	0.006084	0.004615	0	None	No	0.01	Param.
Lithium total (mg/L)	MW-1610	0.2106	0.1638	0.165	No	20	0.1892	0.04588	0	None	x^(1/3)	0.01	Param.
Mercury total (mg/L)	MW-1610	0.001	0.00006	0.002	No	20	0.000953	0.0002102	95	None	No	0.01	NP (NDs)
<b>Molybdenum total (mg/L)</b>	<b>MW-1610</b>	<b>0.1769</b>	<b>0.122</b>	<b>0.1</b>	<b>Yes</b>	<b>20</b>	<b>0.1547</b>	<b>0.05485</b>	<b>0</b>	<b>None</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param.</b>
Selenium total (mg/L)	MW-1610	0.0003578	0.0002092	0.05	No	20	0.0002835	0.0001308	5	None	No	0.01	Param.
Thallium total (mg/L)	MW-1610	0.0002	0.00003	0.002	No	20	0.000146	0.00008469	70	None	No	0.01	NP (NDs)

### Parametric Confidence Interval

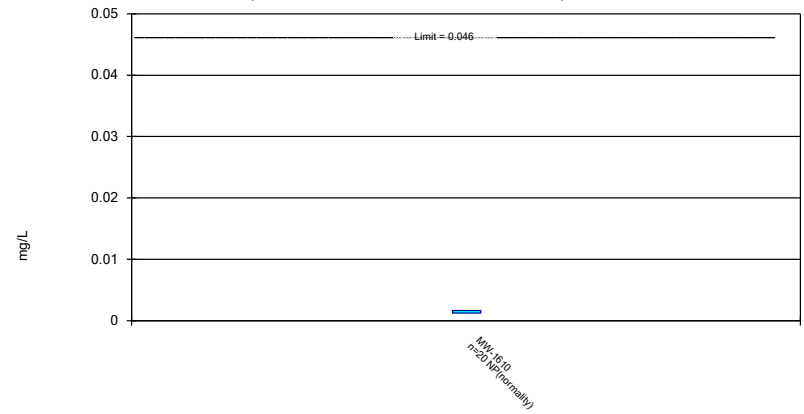
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Antimony total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

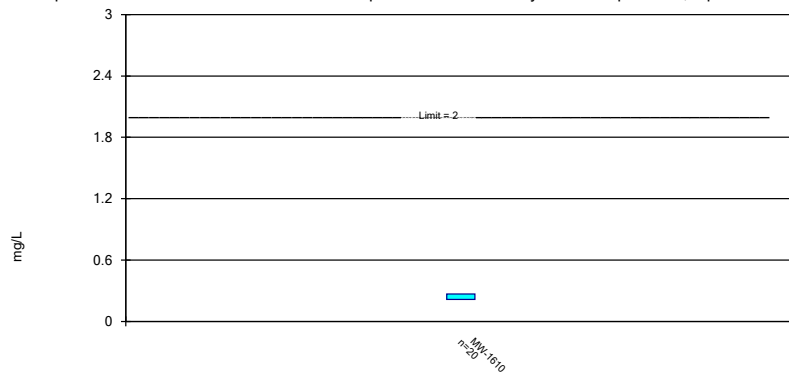
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Arsenic total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

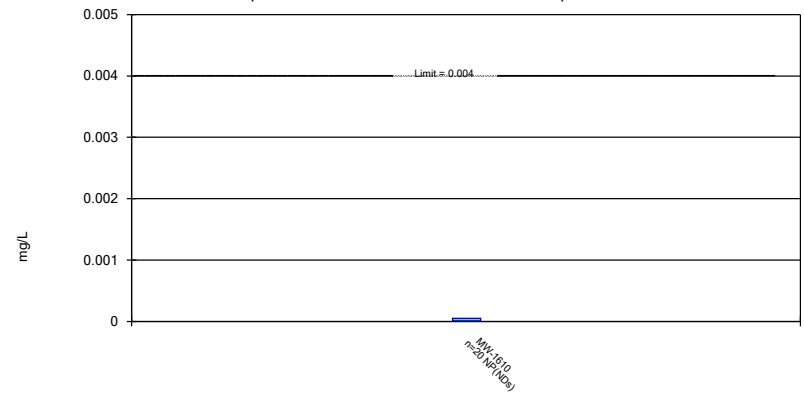
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

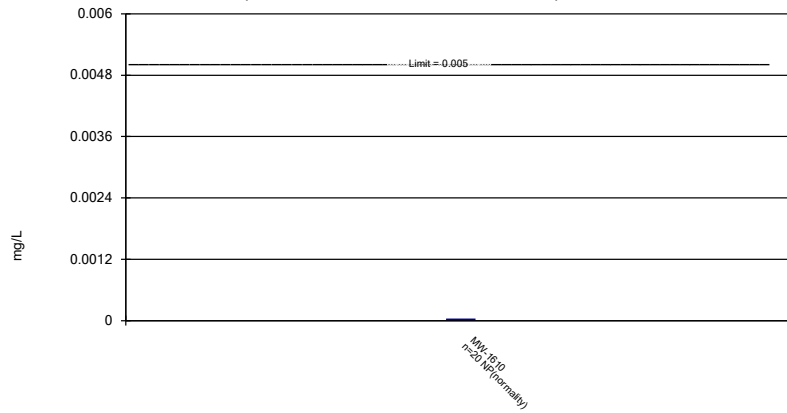
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Beryllium total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

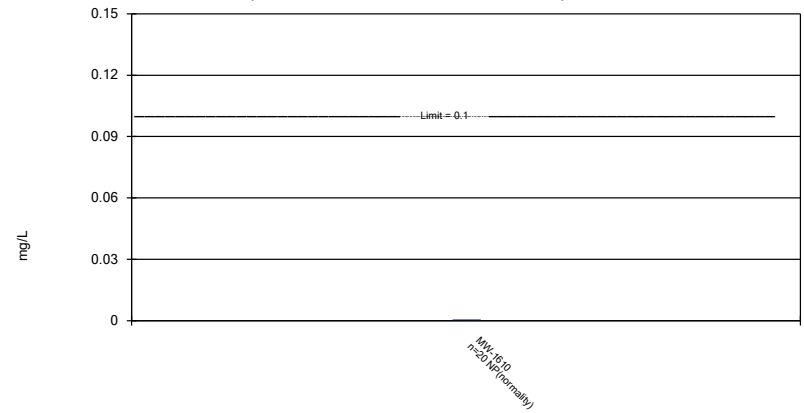
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Cadmium total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Inter  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

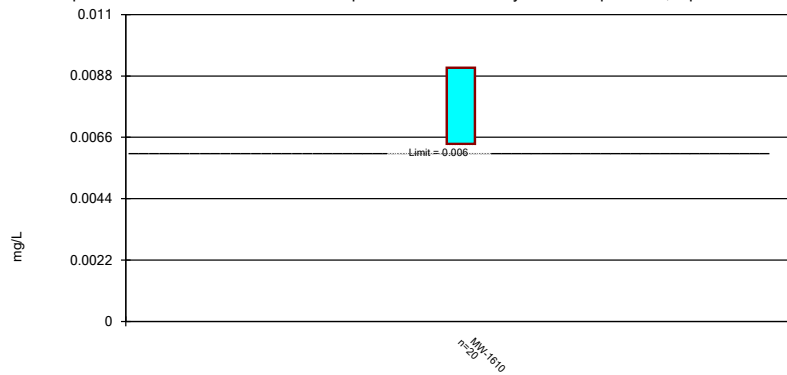
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Chromium total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Inter  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

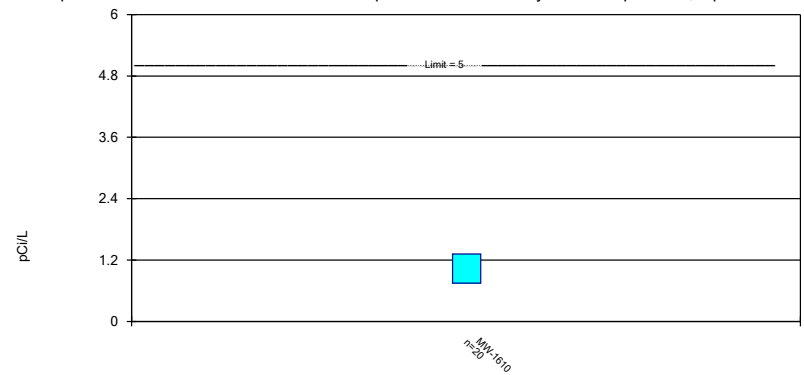
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Intervals  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

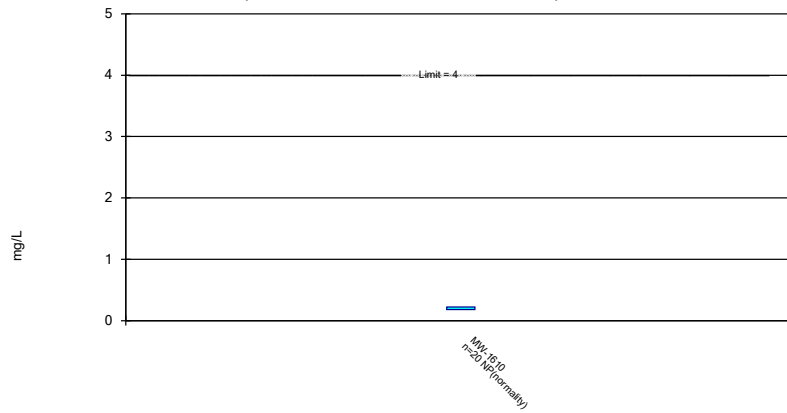
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Combined Radium 226 and 228 Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

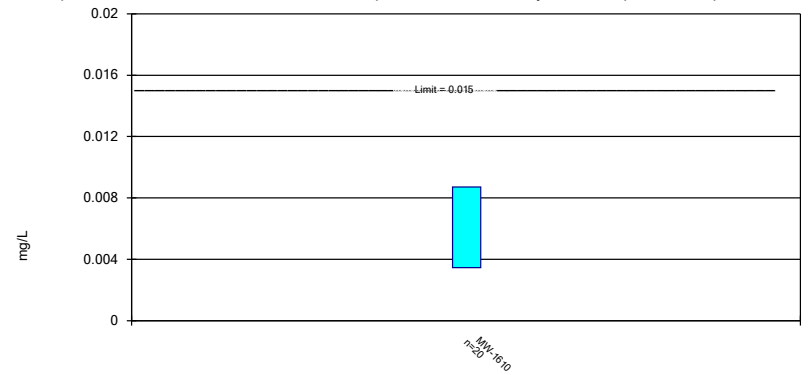
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interva  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

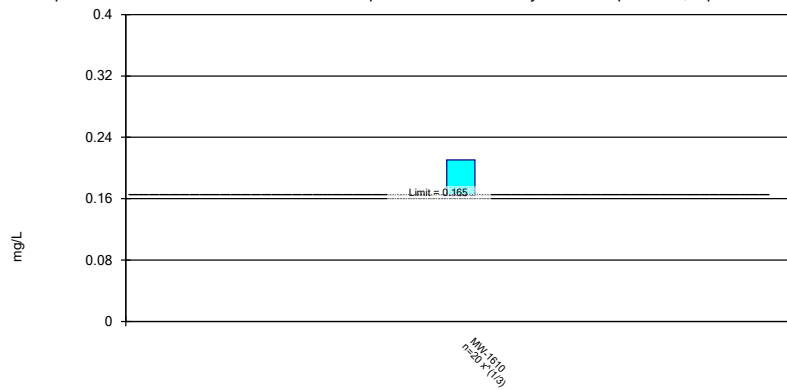
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lead total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Intervals  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

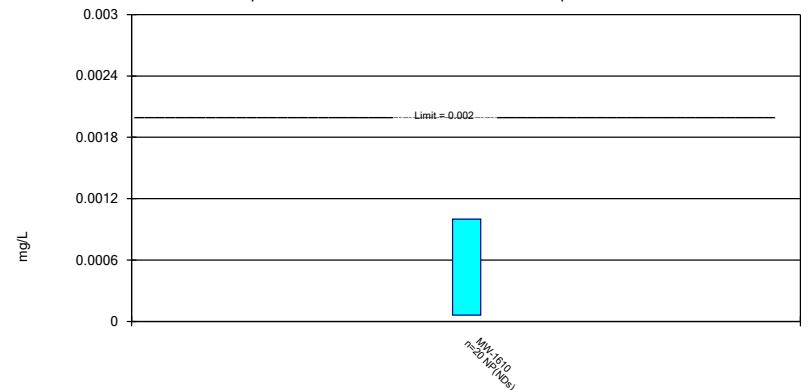
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interval  
Clinch River LF Client: AEP Data: Clinch River

### Non-Parametric Confidence Interval

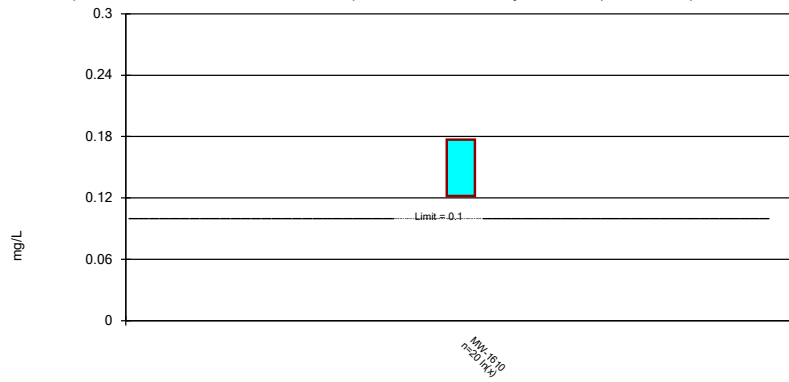
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Mercury total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interva  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

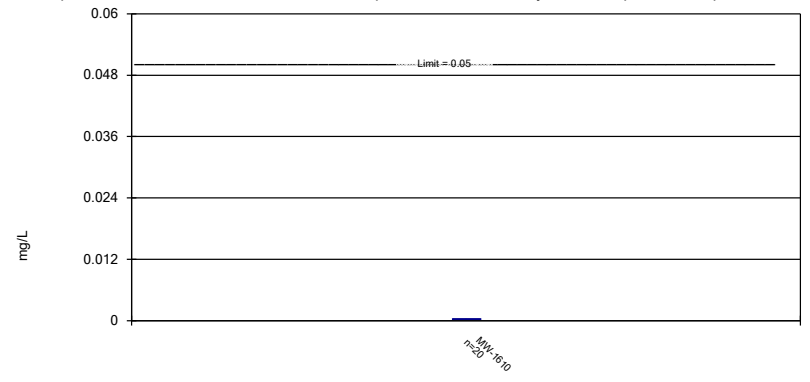
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Molybdenum total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

### Parametric Confidence Interval

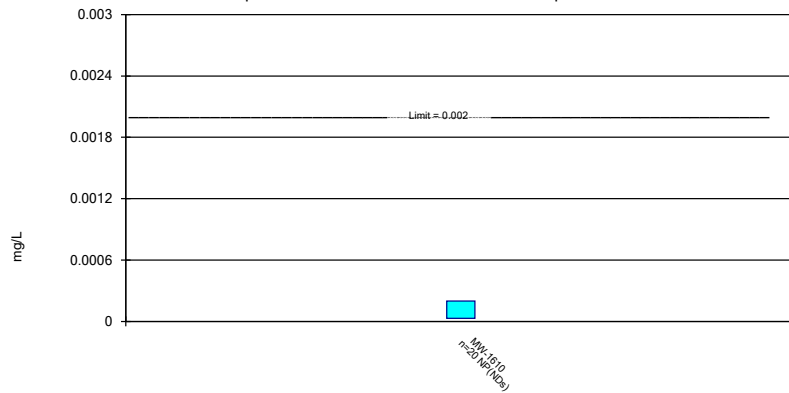
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Selenium total Analysis Run 8/9/2022 9:08 AM 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: Thallium total Analysis Run 8/9/2022 9:08 AM View: Dumps Fault - Pond 1 Confidence Interv  
Clinch River LF Client: AEP Data: Clinch River

**APPENDIX 3 – Alternate Source Demonstrations**

No new alternate source demonstrations have been completed as of January 31, 2023.

## **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**

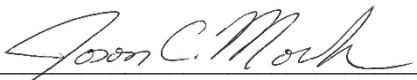
This notice is being provided, as required by 40 CFR 257.95(g)(5), that an Assessment of Corrective Measures was initiated on October 13, 2019 for Clinch River Plant's Pond 1 due to the statistically significant concentrations detected above the established groundwater protection standards for cobalt, lithium, molybdenum and barium.

**APPENDIX 5 – Well Installation/Decommissioning Logs**

Boring logs and well construction certificates for wells installed during the reporting period follow.

**Groundwater Monitoring Well Certification**  
Appalachian Power Company  
Clinch River Plant  
Pond 1 Nature and Extent Study Well Installation  
Cleveland, Virginia

I certify, as a qualified professional engineer in the Commonwealth of Virginia, that monitoring wells W-2201S, W-2201D, W-2202S, W-2202D, W-2203S, W-2203D, and W-2204 were installed in accordance with the boring log and monitoring well construction diagram provided to comply with VAC20-81-250.A.3.d. This certification has been prepared to comply with the requirements of 9VAC20-81-250.A.3.g.

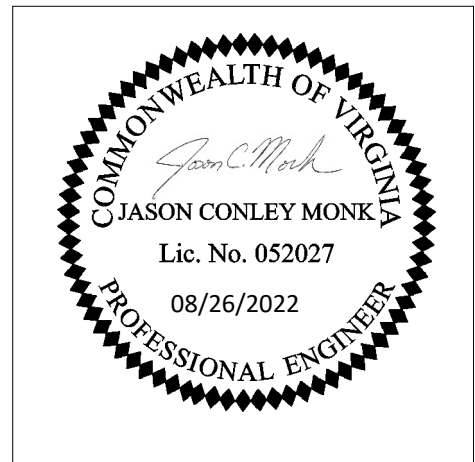
  
\_\_\_\_\_  
Signature

08/26/2022  
\_\_\_\_\_  
Date

Jason C. Monk, P.E.  
Project Manager  
Wood Environment and Infrastructure Solutions, Inc.  
1070 West Main Street, Suite 1  
Abingdon, VA 24210


Attachments:

- 1) Boring Logs
- 2) Well Construction Diagrams



## **Attachment 1:**

Boring Logs

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES	Undisturbed Sample	Auger Cuttings																												
<b>COARSE GRAINED SOILS</b> (More than 50% of material is LARGER than No. 200 sieve size)	<b>GRAVELS</b> (More than 50% of coarse fraction is LARGER than the No. 4 sieve size)	CLEAN GRAVELS (Little or no fines)	GW Well graded gravels, gravel - sand mixtures, little or no fines.	Split Spoon Sample	Bulk Sample																												
		GRAVELS WITH FINES (Appreciable amount of fines)	GP Poorly graded gravels or gravel - sand mixtures, little or no fines.			Sonic Core (S.C.)	Casing Advance																										
		<b>SANDS</b> (More than 50% of coarse fraction is SMALLER than the No. 4 Sieve Size)	CLEAN SANDS (Little or no fines)	GM Silty gravels, gravel - sand - silt mixtures.	Rock Core (RC)	Grab Sample																											
			GRAVELS WITH FINES (Appreciable amount of fines)	GC Clayey gravels, gravel - sand - clay mixtures.	Water Table after 48 hours	No Recovery																											
	<b>FINE GRAINED SOILS</b> (More than 50% of material is SMALLER than No. 200 sieve size)	<b>SILTS AND CLAYS</b> (Liquid limit LESS than 50)	SW Well graded sands, gravelly sands, little or no fines.	Water Table at time of drilling	Water Table After Well Construction																												
			SP Poorly graded sands or gravelly sands, little or no fines.	FILL HIGHLY WEATHERED ROCK LIMESTONE	SHALE SANDSTONE																												
			SM Silty sands, sand - silt mixtures																														
		SC Clayey sands, sand - clay mixtures.																															
		<b>SILTS AND CLAYS</b> (Liquid limit GREATER than 50)	ML Inorganic silts and very fine sands, rock flour, silty of clayey fine sands or clayey silts and with slight plasticity.	Correlation of Penetration Resistance with Relative Density and Consistency																													
			CL Inorganic silts and clayey silts of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.																														
OL Organic silts and organic silty clays of low plasticity.	<table border="1"> <thead> <tr> <th colspan="2">SAND &amp; GRAVEL</th> <th colspan="2">SILT &amp; CLAY</th> </tr> <tr> <th>No. of Blows</th> <th>Relative Density</th> <th>No. of Blows</th> <th>Consistency</th> </tr> </thead> <tbody> <tr> <td>0 - 4</td> <td>Very Loose</td> <td>0 - 1</td> <td>Very Soft</td> </tr> <tr> <td>5 - 10</td> <td>Loose</td> <td>2 - 4</td> <td>Soft</td> </tr> <tr> <td>11 - 20</td> <td>Firm</td> <td>5 - 8</td> <td>Firm</td> </tr> <tr> <td>21 - 30</td> <td>Very Firm</td> <td>9 - 15</td> <td>Stiff</td> </tr> <tr> <td>31 - 50</td> <td>Dense</td> <td>16 - 30</td> <td>Very Stiff</td> </tr> <tr> <td>Over 50</td> <td>Very Dense</td> <td>Over 31</td> <td>Hard</td> </tr> </tbody> </table>		SAND & GRAVEL		SILT & CLAY		No. of Blows	Relative Density	No. of Blows	Consistency	0 - 4	Very Loose	0 - 1	Very Soft	5 - 10	Loose	2 - 4	Soft	11 - 20	Firm	5 - 8	Firm	21 - 30	Very Firm	9 - 15	Stiff	31 - 50	Dense	16 - 30	Very Stiff	Over 50	Very Dense	Over 31
SAND & GRAVEL		SILT & CLAY																															
No. of Blows	Relative Density	No. of Blows	Consistency																														
0 - 4	Very Loose	0 - 1	Very Soft																														
5 - 10	Loose	2 - 4	Soft																														
11 - 20	Firm	5 - 8	Firm																														
21 - 30	Very Firm	9 - 15	Stiff																														
31 - 50	Dense	16 - 30	Very Stiff																														
Over 50	Very Dense	Over 31	Hard																														
<b>HIGHLY ORGANIC SOILS</b>	MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	PT Peat and other highly organic soils.																															
	CH Inorganic clays of high plasticity, fat clays																																
	OH Organic clays of medium to high plasticity, organic silts.																																
<b>BOUNDARY CLASSIFICATIONS:</b> Soils possessing characteristics of two groups are designated by combinations of group symbols.																																	
<table border="1"> <thead> <tr> <th rowspan="2">SILT OR CLAY</th> <th colspan="3">SAND</th> <th colspan="2">GRAVEL</th> <th rowspan="2">Cobbles</th> <th rowspan="2">Boulders</th> </tr> <tr> <th>Fine</th> <th>Medium</th> <th>Coarse</th> <th>Fine</th> <th>Coarse</th> </tr> </thead> <tbody> <tr> <td></td> <td>No.200</td> <td>No.40</td> <td>No.10</td> <td>No.4</td> <td>3/4"</td> <td>3"</td> <td>12"</td> </tr> </tbody> </table> <p style="text-align: center;">U.S. STANDARD SIEVE SIZE</p>						SILT OR CLAY	SAND			GRAVEL		Cobbles	Boulders	Fine	Medium	Coarse	Fine	Coarse		No.200	No.40	No.10	No.4	3/4"	3"	12"							
SILT OR CLAY	SAND			GRAVEL			Cobbles	Boulders																									
	Fine	Medium	Coarse	Fine	Coarse																												
	No.200	No.40	No.10	No.4	3/4"	3"	12"																										
<h2>KEY TO SYMBOLS AND DESCRIPTIONS</h2>																																	
																																	
Wood Environment & Infrastructure Solutions, Inc. 1070 West Main Street, Suite 5 Abingdon, Virginia 24210																																	
<b>Reference:</b> The Unified Soil Classification System, Corps of Engineers, U.S. Army Technical Memorandum No. 3-357, Vol. 1, March, 1953 (Revised April, 1960)																																	



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# BORING NUMBER W-2201D

PAGE 1 OF 4

**CLIENT** AEP **PROJECT NAME** Pond 1 NES  
**PROJECT NUMBER** 3050190394.\*\*\*\*.11 **PROJECT LOCATION** Carbo, VA  
**DATE STARTED** 4/4/22 **COMPLETED** 6/8/22 **GROUND ELEVATION** 1503.018 ft **HOLE SIZE** 6"  
**DRILLING CONTRACTOR** AEP/Zach Racer **WELL LOCATION:**  
**DRILLING METHOD** Split Spoon (soil)/NQ Dietrich D120 (bedrock) **NORTHING:** 3521816.351  
**LOGGED BY** Leslie Montoya **CHECKED BY** Jason Monk **EASTING:** 10403350.36  
**NOTES**  $\nabla$  **DEPTH TO WATER (ft bgs)** 8.11 ft / Elev 1494.91 ft

GENERAL BH / TP / WELL - GINT STD US.GDT - 8/26/22 12:48 - C:\USERS\LESLIE.MONTOYA.GLOBAL\DESKTOP\GLEN LYN GINT\CLINCH RIVER 2022.GPJ

DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)
0						
0.2			2-1-1 (2)		ROOT MAT	1502.8
2.0			1-1-4 (5)		SANDY CLAY (CLS): dark brown, firm, moist, with trace organics, rootlets	1501.0
3.0						1500.0
3.7			2-6-8 (14)		GRAVEL (GP): light gray, moist, poorly graded	1499.3
4.5						1498.5
5.0			14-12-6 (18)		SILTY CLAY (CL-ML): light brown, vert stiff, moist	1498.0
5.7						1497.4
7.0			6-5-4 (9)		SILTY CLAY (CL-ML): dark brown, stiff, moist	1496.0
7.5						1495.6
7.8			1-2-2 (4)		GRAVEL (GP): light gray, moist	1495.3
8.0						1495.0
8.9						1494.1
9.2						1493.9
10.5			2-2-1 (3)		SILTY CLAY (CL-ML): grayish brown, firm, moist, with gravel	1492.5
12.0			1-1-2 (3)		SILTY SAND (SM): light brown, soft, wet	1491.0
14.6			3-1-2 (3)		SILTY SAND (SM): grayish brown to olive, soft, wet, with trace clay	1488.4
18.0			5-19-42 (61)		SHALE: medium gray, highly weathered, dry.	1485.0
24.6					Refusal at 17.8'. Bedrock.	
24.8					SHALE: dark gray, moderately hard, intensely fractured, thinly bedded, moderately weathered, fractures at 55 degrees	
25.0		38 (0)			very soft weathered zone from 24.6' to 24.8'	1478.0

(Continued Next Page)



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**BORING NUMBER W-2201D**

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
25					
		80 (0)			SHALE: dark gray, moderately hard, highly fractured, thinly bedded, moderately weathered, fractures at 60 degrees, slickensides throughout
30					30.0 Weathered zone from 29.5' to 30.0' 1473.0
		92 (24)			SHALE: dark gray, hard, highly fractured, thinly bedded, moderately weathered, fractures at 60 degrees, slickensides throughout Calcite veins from 30.1' to 30.3' Light gray limestone interbeds with calcite infilling from 30.2' to 33.2'
35					Decomposed zone from 34.0' to 34.7'
					36.0 1467.0
		37 (0)			SHALE: dark gray, hard, intensely fractured, thinly bedded, severely weathered, fractures at 60 degrees, slickensides throughout Decomposed zone from 36.1' to 36.35'
40					
					Decomposed zone from 44.0' to 45.0'
45					
					46.0 1457.0
		70 (22)			SHALE: dark gray, hard, moderately fractured, thinly bedded, moderately weathered, fractures at 60 degrees, slickensides throughout Brown sandstone interbed at 46.25' Brown sandstone interbed at 47.55' Brown sandstone interbed at 48.21' Light gray limestone interbeds with calcite infilling from 48.3' to 50.8'
50					





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**BORING NUMBER W-2201D**

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

GENERAL BH / TP / WELL - GINT STD US.GDT - 8/26/22 12:48 - C:\USERS\LESLIE.MONTOYA.GLOBAL\DESKTOP\GLEN LYN GINT\CLINCH RIVER 2022.GPJ

DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
55					SHALE: dark gray, hard, moderately fractured, thinly bedded, moderately weathered, fractures at 60 degrees, slickensides throughout ( <i>continued</i> ) Decomposed zone at 54.0'
		77 (17)			Pyrite pin dots with calcite infilling at 55.1' Disturbed bedding at 55.3'
60					Light gray limestone interbeds with calcite veins running perpendicular to bedding from 56.25' to 56.7'
		96 (0)			Decomposed zone from 60.5' to 60.8'
65					
		69 (17)			Brown sandstone interbed at 66.3' Brown sandstone interbed at 66.55' Decomposed zone from 67.4' to 67.8'
70					Light gray limestone interbeds with calcite veins running perpendicular to bedding from 70.0' to 70.3'
		78 (26)			Brown sandstone interbed at 73.65'
75					Moderately fractured zone with weathered material on fracture face from 74.5' to 74.7'
					Weathered fracture at 75.95' Disturbed bedding, highly weathered zone with silt on fractures and joints from 76.15' to 77.0' Brown sandstone interbed at 76.8'
80					

(Continued Next Page)



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**BORING NUMBER W-2201D**

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
85		66 (15)			SHALE: dark gray, hard, moderately fractured, thinly bedded, moderately weathered, fractures at 60 degrees, slickensides throughout ( <i>continued</i> ) Brown sandstone interbed at 82.5'
					85.0 Brown sandstone interbeds, disturbed bedding, calcite on fracture faces throughout at 84.4' 1418.0
90		100 (63)			SHALE: dark gray, hard, moderately fractured, thinly bedded, slightly weathered, fractures at 60 degrees, slickensides throughout Brown sandstone interbed at 85.6' Calcite stringers at 85.9' Brown sandstone interbed at 86.5' Calcite vug at 86.65' Disturbed bedding with light gray limestone interbeds and brown sandstone interbed at 87.0' Brown sandstone and light gray limestone disturbed interbeds from 87.2' to 87.6'
95					Weathered fracture at 91.2'
					Disturbed bedding from 93.5' to 93.9' Fractured zone from 93.91' to 94.2'
					Brown sandstone interbed at 94.7' Fractured zone with weathered material on fracture face from 94.8' to 95.0' Light gray limestone and brown sandstone interbeds with calcite veins from 95.55' to 96.4'
					Brown sandstone interbed at 97.0'
100		69 (33)			Fractured zone with pyrite on fracture faces from 100.0' to 100.5'
					101.5 1401.5

Terminated borehole at 101.5 feet.



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# BORING NUMBER W-2202D

PAGE 1 OF 4

CLIENT AEP PROJECT NAME Pond 1 NES  
 PROJECT NUMBER 3050190394.\*\*\*\*.11 PROJECT LOCATION Carbo, VA  
 DATE STARTED 4/6/22 COMPLETED 5/17/22 GROUND ELEVATION 1510.274 ft HOLE SIZE 6"  
 DRILLING CONTRACTOR AEP/Zach Racer WELL LOCATION:  
 DRILLING METHOD Split Spoon (soil)/NQ Dietrich D120 (bedrock) NORTHING: 3522079.837  
 LOGGED BY Leslie Montoya CHECKED BY Jason Monk EASTING: 10403654.071  
 NOTES \_\_\_\_\_ ∇ DEPTH TO WATER (ft bgs) 12.35 ft / Elev 1497.92 ft

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	
0					GRAVEL ROAD	
						1508.8
			2-2-3 (5)		FILL	
			7-3-2 (5)			
5			3-3-3 (6)			
			2-2-4 (6)			
					GRAVEL: yellow brown, moist, with clay	1503.1
			1-8-7 (15)			
						1501.1
			1-3-3 (6)		SILTY CLAY (CL-ML): brown, firm, moist, with gravel, black organics	1500.8
10					SILTY CLAY (CL-ML): gray to olive, firm, moist	1500.4
					SILTY CLAY (CL-ML): yellow brown to gray, firm, moist	1499.6
			2-2-3 (5)		SILTY CLAY (CL-ML): dark gray, firm, moist	1499.4
					SILTY CLAY (CL-ML): mottled light brown and gray, firm, moist	1498.6
					SANDY CLAY (CLS): olive to light brown, firm, moist	1498.5
			2-2-2 (4)		SANDY CLAY (CLS): light brown, firm, moist	1497.5
					CLAYEY SAND (SC): medium brown to gray, soft, moist	1497.1
					SANDY CLAY (CLS): light brown, soft, moist, with black organics	1496.5
15			2-1-2 (3)		CLAYEY SAND (SC): medium brown, soft, moist, fine grained, moderately sorted	1495.6
					CLAYEY SAND (SC): medium brown, soft, wet, fine grained, moderately sorted	1494.8
			2-1-2 (3)		SILTY SAND (SM): light gray, soft, wet, fine grained, moderately sorted, with HWR	1493.8
					CLAYEY SAND (SC): light brown, soft, wet	1493.3
			5-4-18 (22)		SILTY SAND (SM): light gray, soft, wet, well sorted, medium grained	1492.8
					SHALE: dark gray, soft, highly fractured, intensely fractured, thinly bedded, severely weathered. Refusal at 23.0', bedrock	
			10-18-35 (53)			
20			14			
						1487.3
					SHALE: dark gray, moderately hard, highly fractured at 50 and 90 degrees, thinly bedded, moderately weathered, with slickensides throughout	
25		86				

(Continued Next Page)



CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
25		(0)			SHALE: dark gray, moderately hard, highly fractured at 50 and 90 degrees, thinly bedded, moderately weathered, with slickensides throughout ( <i>continued</i> )
		75 (0)			Calcite veins at 27.0' Highly fractured zone across bedding with calcite infills from 27.7' to 28.5'
30		100 (36)			31.5 Light gray limestone interbeds with calcite veins from 31.0' to 31.5' 1478.8 32.0 Weathered zone with decomposed material at 31.1' 1478.3
		33 (0)			SHALE: dark gray, hard, highly fractured at 60 degrees, thinly bedded, moderately weathered, with slickensides throughout, more sand content (larger grain size) SHALE: dark gray, moderately hard, moderately fractured at 60 degrees, thinly bedded, moderately weathered, with slickensides throughout
35		100 (21)			
		86 (0)			41.2 SHALE: dark gray, hard, moderately fractured at 60 degrees, thinly bedded, moderately weathered, with slickensides throughout 1469.1
40		100 (72)			
		100 (75)			Weathered zone with decomposed material at 44.6' Calcite vein cross-cutting bedding at 46.8' Weathered zone with decomposed material at 47.3'
45		90 (5)			Calcite veins cross-cutting light gray limestone interbeds at 50.4' Fracture with decomposed material at 50.65'
50					

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**BORING NUMBER W-2202D**

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
55		99 (43)			SHALE: dark gray, hard, moderately fractured at 60 degrees, thinly bedded, moderately weathered, with slickensides throughout ( <i>continued</i> ) Fracture with decomposed material at 54.75' Brown sandstone interbed at 55.1' Disturbed bedding from 56.0' to 57.2'
60		85 (13)			Calcite vugs with microcrystals at 57.6'
		100 (0)			Brown sandstone interbed from 60.5' to 60.6' Brown sandstone interbed with calcite at 62.2'
65		96 (46)			Fracture with decomposed material at 65.2' Disturbed bedding at 65.3'
70		100 (35)			Calcite vein at 68.55' Fracture with decomposed material from 69.0' to 69.4' Change in fracture angle to 70-90 degrees at 69.65'
		82 (15)			Fracture with decomposed material from 70.95' to 80.1'
75					Brown sandstone interbed from 74.2' to 74.5'
80		96 (71)			Fracture across fold from 80.0' to 80.34' Change in fracture angle to ~5 degrees due to folding from 80.41' to 81.2' Small fold with micro thrust fault (~0.15')

(Continued Next Page)



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# BORING NUMBER W-2202D

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
85					SHALE: dark gray, hard, moderately fractured at 60 degrees, thinly bedded, moderately weathered, with slickensides throughout ( <i>continued</i> ) Brown sandstone interbed from 82.35' to 82.7'
		96 (78)			Pyrite pin dots and small pockets from 88.4' to 91.5'
90					
		100 (78)			Pyrite pocket and pin dots at 93.87' Calcite replaced with pyrite between light gray limestone interbeds, pyrite pin dots and pockets throughout from 94.0' to 101.0'
95					
		100 (90)			Medium sized pyrite pocket at 97.2' Medium sized pyrite pocket at 97.4'
100					
					101.0 Medium sized pyrite pocket at 100.5'

Terminated borehole at 101.0 feet.

1409.3

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# BORING NUMBER W-2203D

PAGE 1 OF 4

**CLIENT** AEP **PROJECT NAME** Pond 1 NES  
**PROJECT NUMBER** 3050190394.\*\*\*\*.11 **PROJECT LOCATION** Carbo, VA  
**DATE STARTED** 4/7/22 **COMPLETED** 6/14/22 **GROUND ELEVATION** 1501.685 ft **HOLE SIZE** 6"  
**DRILLING CONTRACTOR** AEP/Zach Racer **WELL LOCATION:**  
**DRILLING METHOD** Split Spoon (soil)/NQ Dietrich D120 (bedrock) **NORTHING:** 3521867.071  
**LOGGED BY** Leslie Montoya **CHECKED BY** Jason Monk **EASTING:** 10403426.914  
**NOTES**  $\nabla$  **DEPTH TO WATER (ft bgs)** 13.80 ft / Elev 1487.89 ft

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION
0					GRAVEL FILL	1500.2
1.5						1499.7
2-3-3 (6)					SILTY CLAY (CL-ML): dark brown, soft, moist, with organics SANDY CLAY (CLS): medium brown, firm, moist, with gravel, organics	1498.7
3.0						1498.7
3.4					SILTY CLAY (CL-ML): dark brown, soft, moist, with rootlets, gravel	1498.3
3.7					SILTY CLAY (CL-ML): dark brown, firm, moist, with rootlets, gravel	1498.0
4.5					SILTY SAND (SM): medium brown, soft, moist, fine grained	1497.2
4.9					SILTY CLAY (CL-ML): dark brown, soft, wet, with gravel	1496.8
6.0					SANDY CLAY (CLS): medium brown with gray mottling, firm, moist, with black organics	1495.7
7.0					CLAYEY SAND (SC): medium brown to gray, soft, moist	1494.7
7.7					SANDY CLAY (CLS): medium gray with light gray mottling, firm, moist	1494.0
9.5					CLAYEY SAND (SC): medium gray with light gray mottling, firm, moist	1492.2
10-20-39 (59)					SILTY SAND (SM): reddish brown, soft, wet, fine grained, well sorted	1490.0
11.7						1489.3
12.4					SILTY SAND (SM): light gray, soft, wet, fine grained, well sorted, with dark gray and maroon highly weathered rock (HWR) HWR: light to dark gray, moist. Refusal at 15.5', bedrock	1489.3
15.5					$\nabla$ NO RECOVERY: Augered to 18.0'	1486.2
18.0					SHALE: moderately hard, dark gray, highly fractured at 55 degrees, thinly bedded, moderately weathered, with slickensides throughout Light gray limestone interbed with calcite veins cross-cutting bedding at 19.0'	1483.7
44 (0)						

(Continued Next Page)



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**BORING NUMBER W-2203D**

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
25					SHALE: moderately hard, dark gray, highly fractured at 55 degrees, thinly bedded, moderately weathered, with slickensides throughout ( <i>continued</i> )
30		36 (0)			
		78 (0)			Disturbed bedding at 32.0'
35		65 (0)			Disturbed light gray limestone interbeds at 33.9'
					Fractures at 70 degrees, fracture with weathered material at 36.0'
40		23 (0)			
45		68 (21)			Brown sandstone interbed at 46.0' Light gray limestone interbeds with cross-cutting calcite veins at 46.2'
					48.4
50		100 (61)			SHALE: hard, dark gray, moderately fractured at 55 degrees, thinly bedded, moderately weathered, with slickensides throughout Brown sandstone interbed at 48.9'
					Brown sandstone interbed at 50.8'
					Weathered, highly fractured zone with decomposed material at 51.5' to 52.1'
					Weathered zone with fractured brown sandstone interbed at 52.55'
					Disturbed bedding with fractures at 65 degrees from 53.0' to 53.4'
					1453.3

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CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
55		65 (14)			SHALE: hard, dark gray, moderately fractured at 55 degrees, thinly bedded, moderately weathered, with slickensides throughout ( <i>continued</i> )  Brown sandstone interbed at 55.15'
					Brown sandstone interbed at 57.7'
60		58 (20)			Fracture with weathered material and calcite veins at 59.08' Fracture with weathered material at 59.4'
					Light gray limestone interbed with calcite cross-cutting veins at 62.6' Micro thrust fault with calcite at 62.7' Light gray limestone interbeds with cross-cutting calcite veins from 63.5' to 65.0'
65					Brown sandstone interbed at 65.2'
					Light gray limestone interbeds with cross-cutting calcite veins at 66.3'
		75 (40)			Light gray interbed with disturbed bedding at 67.9' Light gray limestone interbeds with cross-cutting calcite veins at 68.4' Disturbed bedding from 68.5' to 69.7'
70					Brown sandstone interbed at 69.85'
					Brown sandstone interbed at 72.95'
					Weathered fracture zone at 73.9'
75					Brown sandstone interbed at 74.7'
					Brown sandstone interbed at 75.45'
					Weathered zone at 76.05' to 76.2'
					Brown sandstone interbed at 76.55'
80		74 (43)			Brown sandstone interbed at 80.05' Brown sandstone interbed fragment at 80.5'
					Brown sandstone interbed at 81.2' Disturbed bedding with brown sandstone fragment cross-cutting bedding at 81.4'

(Continued Next Page)



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**BORING NUMBER W-2203D**

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
85		90 (48)			Fracture with weathered material at 81.75' SHALE: hard, dark gray, moderately fractured at 55 degrees, thinly bedded, moderately weathered, with slickensides throughout ( <i>continued</i> )
90		98 (77)			Brown sandstone interbed at 90.85'
95		93 (62)			Small-scale fold at 94.75' Weathered zone at 94.9' Disturbed bedding from 95.1' to 95.3' Light gray limestone interbed with cross-cutting calcite veins at 95.85'
98.4					Terminated borehole at 98.4 feet.

1403.3



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# BORING NUMBER W-2204

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**CLIENT** AEP **PROJECT NAME** Pond 1 NES  
**PROJECT NUMBER** 3050190394.\*\*\*\*.11 **PROJECT LOCATION** Carbo, VA  
**DATE STARTED** 4/12/22 **COMPLETED** 6/8/22 **GROUND ELEVATION** 1754.058 ft **HOLE SIZE** 6"  
**DRILLING CONTRACTOR** AEP/Zach Racer **WELL LOCATION:**  
**DRILLING METHOD** Split Spoon (soil)/NQ Dietrich D120 (bedrock) **NORTHING:** 3522273.967  
**LOGGED BY** Leslie Montoya **CHECKED BY** Jason Monk **EASTING:** 10401270.229  
**NOTES** Loss of water at 41.5'. **DEPTH TO WATER (ft bgs)** ---

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DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION (ft)
0						
0.2				[Hatched]	ROOTMAT	1753.9
0.7			5-7-10 (17)	[Hatched]	SILTY CLAY (CL-ML): medium brown, firm, moist, with roots and gravel	1753.4
0.8				[Hatched]	GRAVEL	1753.3
1.5				[Hatched]	SILTY CLAY (CL-ML): reddish brown, stiff, moist, with highly weathered rock (limestone)	1752.6
2.0			5-8-12 (20)	[Hatched]	SILTY CLAY (CL-ML): dark brown, firm, moist, with rootlets	1752.1
3.4				[Hatched]	SILTY CLAY (CL-ML): reddish brown, stiff, moist, with highly weathered rock (limestone)	1750.7
3.5			9-9-22 (31)	[Hatched]	Limestone cobble, light brown, highly weathered	1750.5
4.4				[Hatched]	SILTY CLAY (CL-ML): reddish brown, stiff to very stiff, moist, with highly weathered rock (limestone)	1749.7
29-38				[Brick]	LIMESTONE: Highly weathered limestone residuum, light yellow gray to light gray	
13-39				[Brick]		
7-32				[Brick]		
19-38				[Brick]		
10.3				[Brick]		1743.8
10.5				[Brick]	LIMESTONE: dark brown to gray, highly weathered, with chert. NO RECOVERY: Refusal at 10.5'. Augered to 13.0'	1743.6
13.0				[Brick]		1741.1
14.4				[Brick]	LIMESTONE: moderately hard, dark gray to tan, highly fractured, thickly bedded, moderately weathered, with tan to brown chert	1739.7
14.7				[Brick]	Black decomposed zone of weathered shale material from 14.35' to 14.65'	1739.4
15.5		100 (32)		[Brick]	LIMESTONE: moderately hard, dark gray to black, highly fractured, thickly bedded, moderately weathered, with shale and mylenite	1738.6
16.4				[Brick]	FAULT BRECCIA: tan to dark gray, large grain, with calcite	1737.7
17.5				[Brick]	Dark gray shale interbed	1736.6
18.55				[Brick]	FAULT BRECCIA: fault breccia, large grain, with light gray and tan limestone, dark gray shale, and calcite veins Pyrite pocket at 18.55'	
21.15		59 (30)		[Brick]	Pyrite pocket cross cut with oxidized fault gouge at 21.15'	
24.0				[Brick]		1730.1
25				[Brick]	LIMESTONE: dark gray, hard, moderately fractured, slightly weathered, medium bedded, with pyrite pockets and calcite veins	

(Continued Next Page)



Wood Environment & Infrastructure Solutions, Inc.  
 216 Centerview Drive, Suite 300  
 Brentwood TN 37027

**BORING NUMBER W-2204**

CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
25					
		51 (23)			25.8 1728.3 Limestone breccia, large grained, with chert and calcite veins
30					
		67 (0)			32.5 1721.6 33.0 1721.1 Tan limestone brecciated zone with calcite Black shale, soft
35		49 (12)			35.3 1718.8 SHALE: black, moderately weathered, highly fractured, thinly bedded, with calcite veins throughout  Soft weathered zone of black shale, fractures at ~55 degrees from 37.3' to 37.75'  Decomposed zone from 38.1' to 38.25' Decomposed zone, severely weathered from 38.62' to 38.8' Calcite crystal pocket and veins from 38.81' to 39.05' Weathered zone from 39.1' to 39.4'
40		100 (60)			41.7 1712.4 LIMESTONE: tan, orange, light gray brecciated, hard, large grained, intensely fractured, no bedding, slightly weathered, with calcite veins, pyrite pockets, calcite crystal infills, and siltstone infills throughout Soft black shale interbed, highly weathered, at 42.05' Soft black shale interbed, highly weathered at 42.32'
45					
		87 (81)			Calcite crystals on fracture face at 49.0' Calcite crystals on fracture face at 49.8'  Soft black shale interbed, decomposed, with pyrite from 50.8' to 51.25'
50					

(Continued Next Page)

GENERAL BH / TP / WELL - GINT STD U.S. GDT - 8/26/22 12:48 - C:\USERS\LESLIE.MONTOYA.GLOBAL\DESKTOP\GLEN LYN GINT\CLINCH RIVER 2022.GPJ



Wood Environment & Infrastructure Solutions, Inc.  
 216 Centerview Drive, Suite 300  
 Brentwood TN 37027

**BORING NUMBER W-2204**

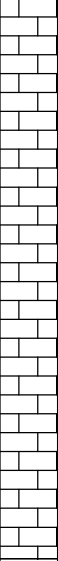



CLIENT AEP

PROJECT NAME Pond 1 NES

PROJECT NUMBER 3050190394.\*\*\*\*.11

PROJECT LOCATION Carbo, VA

GENERAL BH / TP / WELL - GINT STD US.GDT - 8/26/22 12:48 - C:\USERS\LESLIE.MONTOYA.GLOBAL\DESKTOP\GLEN LYN GINT\CLINCH RIVER 2022.GPJ

DEPTH (ft)	FRACTURE DENSITY	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	GRAPHIC LOG	MATERIAL DESCRIPTION
55		100 (80)			Pyrite infill vug at 53.3' Calcite vein with crystals at 53.41' LIMESTONE: tan, orange, light gray brecciated, hard, large grained, intensely fractured, no bedding, slightly weathered, with calcite veins, pyrite pockets, calcite crystal infills, and siltstone infills throughout ( <i>continued</i> )
60		95 (74)			Black shale interbed, decomposed, with pyrite flecks throughout from 60.9' to 61.3' Light gray to green siltstone, clay decomposition, fault gouge, (glauconite?) from 61.3' to 62.1' Decomposed black shale interbed with pyrite flecks throughout from 62.1' to 63.1' Pale tan limestone from 63.1 to 64.0'
65		93 (48)			SHALE: black and olive green, moderately to severely weathered, highly fractured, thinly bedded, with pyrite pockets, pyrite infills, pyrite on fracture faces, glauconite (?) throughout Weathered fracture, microfaults throughout Pyrite pockets at 71.15'
70					Terminated borehole at 74.0 feet.

1690.1

1680.1

## **Attachment 2:**

Well Construction Logs



# MONITORING WELL CONSTRUCTION LOG

**PROJECT NAME:** AEP Clinch River Pond 1 NES  
**PROJECT LOCATION:** Carbo, VA  
**WOOD PROJECT #:** 3050190394.11.\*\*\*\*

**BORING NO:** W-2201S  
**ELEVATION (G.S.):** 1502.820  
**DATE DRILLED:** 5/5/2022 to 5/5/2022  
**DATE WELL CONST.:** 5/5/2022 to 6/8/2022

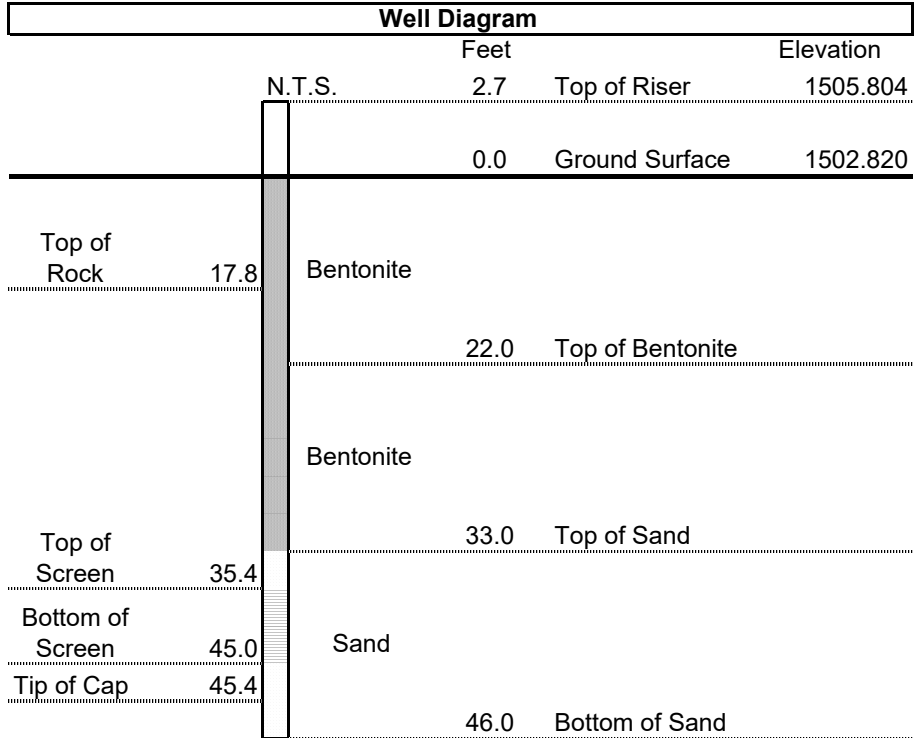
### Monitoring Well Construction Details

Page 1 of 1

Date Set Start: 5/5/2022 Surface Comp: Concrete Grout: Cetco Pure Gold Volclay 30%  
Set By: Zach Racer (AEP) Pipe Size: 2.0" Sand: Global #5 3/29A  
Datum: Ground Surface Screen Size: 0.01" Bentonite: 3/8" TRO Pelplug Coated Pellets  
3/8" Baroid Coarse Grade  
Holeplug

Well Survey Information	
Top of Well Casing Elevation	<u>1505.804</u>
Concrete Pad Elevation	<u>1503.080</u>
Ground Surface Elevation	<u>1502.820</u>
Northing Top of Well Riser	<u>3,521,819.806</u>
Easting Top of Well Riser	<u>10,403,353.438</u>

Well Construction Information	
Depth to Bed Rock	<u>17.8</u>
Depth of Boring - NQ	<u>NA</u>
Depth of Boring - 6" Over Drill	<u>46.0</u>
Bentonite	<u>0.0</u> to <u>22.0</u>
Bentonite	<u>22.0</u> to <u>33.0</u>
Sand	<u>33.0</u> to <u>46.0</u>
Comp. Stickup	<u>2.7</u> to <u>0.0</u>
Riser Pipe to GS	<u>0.0</u> to <u>35.4</u>
Screen	<u>35.4</u> to <u>45.0</u>
Pipe Cap at	<u>45.0</u> to <u>45.4</u>



COMMENTS: 250 lbs sand, 150 lbs bentonite, no grout, 200 lbs bentonite.

Logged by: Leslie Montoya

Checked by: Jason Monk



# MONITORING WELL CONSTRUCTION LOG

**PROJECT NAME:** AEP Clinch River Pond 1 NES  
**PROJECT LOCATION:** Carbo, VA  
**WOOD PROJECT #:** 3050190394.11.\*\*\*\*

**BORING NO:** W-2201D  
**ELEVATION (G.S.):** 1503.018  
**DATE DRILLED:** 4/4/2022 to 4/5/2022  
**DATE WELL CONST.:** 5/4/2022 to 6/8/2022

### Monitoring Well Construction Details

Page 1 of 1

Date Set Start: 5/4/2022 Surface Comp: Concrete Grout: Cetco Pure Gold Volclay 30%  
Set By: Zach Racer (AEP) Pipe Size: 2.0" Sand: Global #5 3/29A  
Datum: Ground Surface Screen Size: 0.01" Bentonite: 3/8" TRO Pelplug Coated Pellets  
3/8" Baroid Coarse Grade  
Holeplug

Well Survey Information	
Top of Well Casing Elevation	<u>1505.835</u>
Concrete Pad Elevation	<u>1503.194</u>
Ground Surface Elevation	<u>1503.018</u>
Northing Top of Well Riser	<u>3,521,816.351</u>
Easting Top of Well Riser	<u>10,403,350.360</u>

Well Construction Information		
Depth to Bed Rock		<u>17.8</u>
Depth of Boring - NQ		<u>101.5</u>
Depth of Boring - 6" Over Drill		<u>86.0</u>
Bentonite	<u>0.0</u> to	<u>1.0</u>
Grout	<u>1.0</u> to	<u>61.0</u>
Bentonite	<u>61.0</u> to	<u>73.0</u>
Sand	<u>73.0</u> to	<u>86.0</u>
Bentonite	<u>86.0</u> to	<u>101.5</u>
Comp. Stickup	<u>2.8</u> to	<u>0.0</u>
Riser Pipe to GS	<u>0.0</u> to	<u>75.4</u>
Screen	<u>75.4</u> to	<u>85.0</u>
Pipe Cap at	<u>85.0</u>	<u>85.4</u>

Well Diagram			
	Feet		Elevation
	N.T.S.	Top of Riser	<u>1505.835</u>
		Ground Surface	<u>1503.018</u>
		Bentonite	
	1.0	Top of Grout	
Top of Rock	<u>17.8</u>		
		Grout	
	61.0	Top of Bentonite	
		Bentonite	
Top of Screen	<u>75.4</u>	Top of Sand	
		Sand	
Bottom of Screen	<u>85.0</u>		
Tip of Cap	<u>85.4</u>	Bottom of Sand	
		Bentonite	
	101.5	Bottom of Bentonite	

COMMENTS: 50 lbs bentonite, 250 lbs sand, 150 lbs bentonite, 50 gal grout, 50 lbs bentonite

Logged by: Leslie Montoya

Checked by: Jason Monk





# MONITORING WELL CONSTRUCTION LOG

**PROJECT NAME:** AEP Clinch River Pond 1 NES  
**PROJECT LOCATION:** Carbo, VA  
**WOOD PROJECT #:** 3050190394.11.\*\*\*\*

**BORING NO:** W-2202S  
**ELEVATION (G.S.):** 1510.277  
**DATE DRILLED:** 5/11/2022 to 5/11/2022  
**DATE WELL CONST.:** 5/11/2022 to 6/14/2022

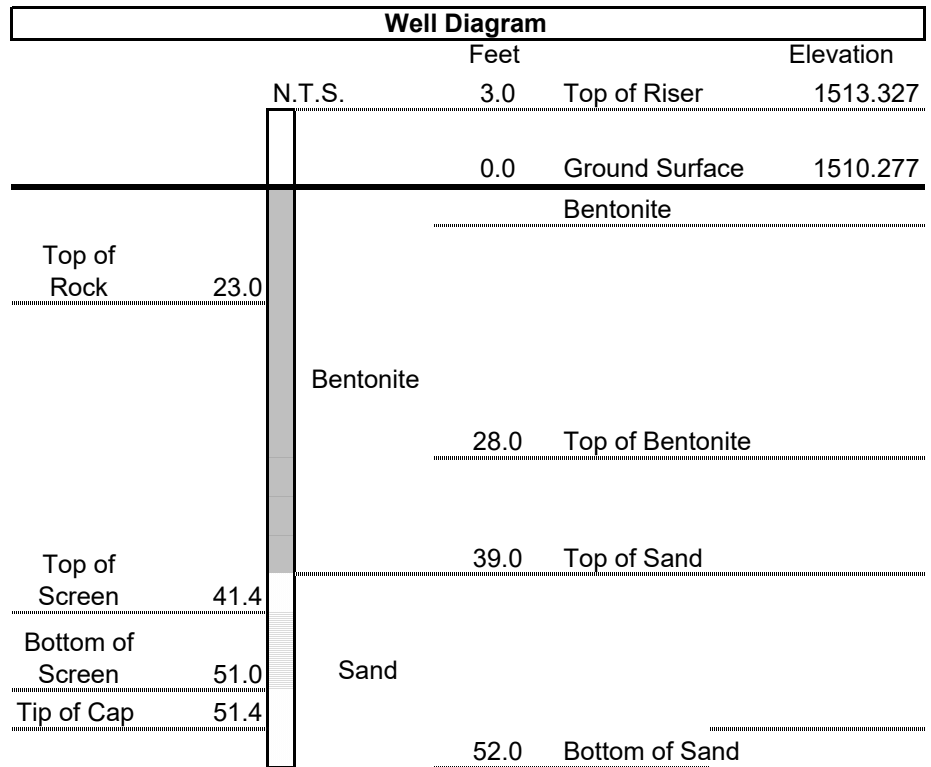
### Monitoring Well Construction Details

Page 1 of 1

Date Set Start: 5/11/2022 Surface Comp: Concrete Grout: Cetco Pure Gold Volclay 30%  
Set By: Zach Racer (AEP) Pipe Size: 2.0" Sand: Global #5 3/29A  
Datum: Ground Surface Screen Size: 0.01" Bentonite: 3/8" TRO Pel Plug Coated Pellets

Well Survey Information	
Top of Well Casing Elevation	<u>1513.327</u>
Concrete Pad Elevation	<u>1510.437</u>
Ground Surface Elevation	<u>1510.277</u>
Northing Top of Well Riser	<u>3,522,082.738</u>
Easting Top of Well Riser	<u>10,403,657.504</u>

Well Construction Information	
Depth to Bed Rock	<u>23.0</u>
Depth of Boring - NQ	<u>NA</u>
Depth of Boring - 6" Over Drill	<u>52.0</u>
Bentonite	<u>0.0</u> to <u>28.0</u>
Bentonite	<u>28.0</u> to <u>39.0</u>
Sand	<u>39.0</u> to <u>52.0</u>
Comp. Stickup	<u>3.0</u> to <u>0.0</u>
Riser Pipe to GS	<u>0.0</u> to <u>41.4</u>
Screen	<u>41.4</u> to <u>51.0</u>
Pipe Cap at	<u>51.0</u> to <u>51.4</u>



**COMMENTS:** Fracture blow out at ~25-30 ft. 250 lbs sand, 150 lbs bentonite (pelplug), 300 lbs bentonite (holeplug)

Logged by: Leslie Montoya

Checked by: Jason Monk



# MONITORING WELL CONSTRUCTION LOG

**PROJECT NAME:** AEP Clinch River Pond 1 NES  
**PROJECT LOCATION:** Carbo, VA  
**WOOD PROJECT #:** 3050190394.11.\*\*\*\*

**BORING NO:** W-2202D  
**ELEVATION (G.S.):** 1510.274  
**DATE DRILLED:** 4/6/2022 to 4/6/2022  
**DATE WELL CONST.:** 5/11/2022 to 5/17/2022

### Monitoring Well Construction Details

Page 1 of 1

Date Set Start: 5/11/2022 Surface Comp: Concrete Grout: Cetco Pure Gold Volclay 30%  
Set By: Zach Racer (AEP) Pipe Size: 2.0" Sand: Global #5 3/29A  
Datum: Ground Surface Screen Size: 0.01" Bentonite: 3/8" TRO Pel Plug Coated Pellets

Well Survey Information	
Top of Well Casing Elevation	<u>1513.180</u>
Concrete Pad Elevation	<u>1510.418</u>
Ground Surface Elevation	<u>1510.274</u>
Northing Top of Well Riser	<u>3,522,079.837</u>
Easting Top of Well Riser	<u>10,403,654.071</u>

Well Construction Information	
Depth to Bed Rock	<u>23.0</u>
Depth of Boring - NQ	<u>101.0</u>
Depth of Boring - 6" Over Drill	<u>82.0</u>
Bentonite	<u>0.0</u> to <u>6.0</u>
Grout	<u>6.0</u> to <u>56.0</u>
Bentonite	<u>56.0</u> to <u>68.0</u>
Sand	<u>68.0</u> to <u>81.0</u>
Bentonite	<u>81.0</u> to <u>82.0</u>
Comp. Stickup	<u>2.9</u> to <u>0.0</u>
Riser Pipe to GS	<u>0.0</u> to <u>70.4</u>
Screen	<u>70.4</u> to <u>80.0</u>
Pipe Cap at	<u>80.0</u> to <u>80.4</u>

Well Diagram			
	Feet		Elevation
	N.T.S.	Top of Riser	<u>1513.180</u>
	2.9	Ground Surface	<u>1510.274</u>
	0.0	Bentonite	
	6.0	Top of Grout	
Top of Rock	<u>23.0</u>		
		Grout	
	56.0	Top of Bentonite	
		Bentonite	
Top of Screen	<u>70.4</u>	Top of Sand	
		Sand	
Bottom of Screen	<u>80.0</u>		
Tip of Cap	<u>80.4</u>	Bottom of Sand	
		Bentonite	
	81.0	Bottom of Bentonite	
	82.0		

COMMENTS: 15 lbs of bentonite, 250 lbs sand, 200 lbs bentonite, 50 gal grout, 150 lbs bentonite

Logged by: Leslie Montoya

Checked by: Jason Monk



# MONITORING WELL CONSTRUCTION LOG

**PROJECT NAME:** AEP Clinch River Pond 1 NES  
**PROJECT LOCATION:** Carbo, VA  
**WOOD PROJECT #:** 3050190394.11.\*\*\*\*

**BORING NO:** W-2203S  
**ELEVATION (G.S.):** 1501.424  
**DATE DRILLED:** 5/9/2022 to 5/10/2022  
**DATE WELL CONST.:** 5/10/2022 to 6/14/2022

### Monitoring Well Construction Details

Page 1 of 1

Date Set Start: 5/9/2022 Surface Comp: Concrete Grout: Cetco Pure Gold Volclay 30%  
Set By: Zach Racer (AEP) Pipe Size: 2.0" Sand: Global #5 3/29A  
Datum: Ground Surface Screen Size: 0.01" Bentonite: 3/8" TRO Pel Plug Coated Pellets

Well Survey Information	
Top of Well Casing Elevation	<u>1504.676</u>
Concrete Pad Elevation	<u>1501.601</u>
Ground Surface Elevation	<u>1501.424</u>
Northing Top of Well Riser	<u>3,521,871.312</u>
Easting Top of Well Riser	<u>10,403,429.544</u>

Well Construction Information	
Depth to Bed Rock	<u>15.5</u>
Depth of Boring - NQ	<u>NA</u>
Depth of Boring - 6" Over Drill	<u>52.0</u>
Bentonite	<u>0.0</u> to <u>3.0</u>
Grout	<u>3.0</u> to <u>29.0</u>
Bentonite	<u>29.0</u> to <u>39.0</u>
Sand	<u>39.0</u> to <u>52.0</u>
Comp. Stickup	<u>3.25</u> to <u>0.0</u>
Riser Pipe to GS	<u>0.0</u> to <u>41.4</u>
Screen	<u>41.4</u> to <u>51.0</u>
Pipe Cap at	<u>51.0</u> to <u>51.4</u>

Well Diagram			
	Feet		Elevation
	N.T.S.	3.3	Top of Riser 1504.676
		0.0	Ground Surface 1501.424
			Bentonite
Top of Rock	15.5	3.0	Top of Grout
			GROUT
		29.0	Top of Bentonite
			Bentonite
Top of Screen	41.4	39.0	Top of Sand
			Sand
Bottom of Screen	51.0		
Tip of Cap	51.4		
		52.0	Bottom of Sand

COMMENTS: 250 lbs sand, 150 lbs bentonite, 30 gal grout, 200 lbs bentonite

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Logged by: Leslie Montoya

Checked by: Jason Monk



# MONITORING WELL CONSTRUCTION LOG

**PROJECT NAME:** AEP Clinch River Pond 1 NES  
**PROJECT LOCATION:** Carbo, VA  
**WOOD PROJECT #:** 3050190394.11.\*\*\*\*

**BORING NO:** W-2203D  
**ELEVATION (G.S.):** 1501.685  
**DATE DRILLED:** 4/7/2022 to 4/12/2022  
**DATE WELL CONST.:** 5/9/2022 to 6/14/2022

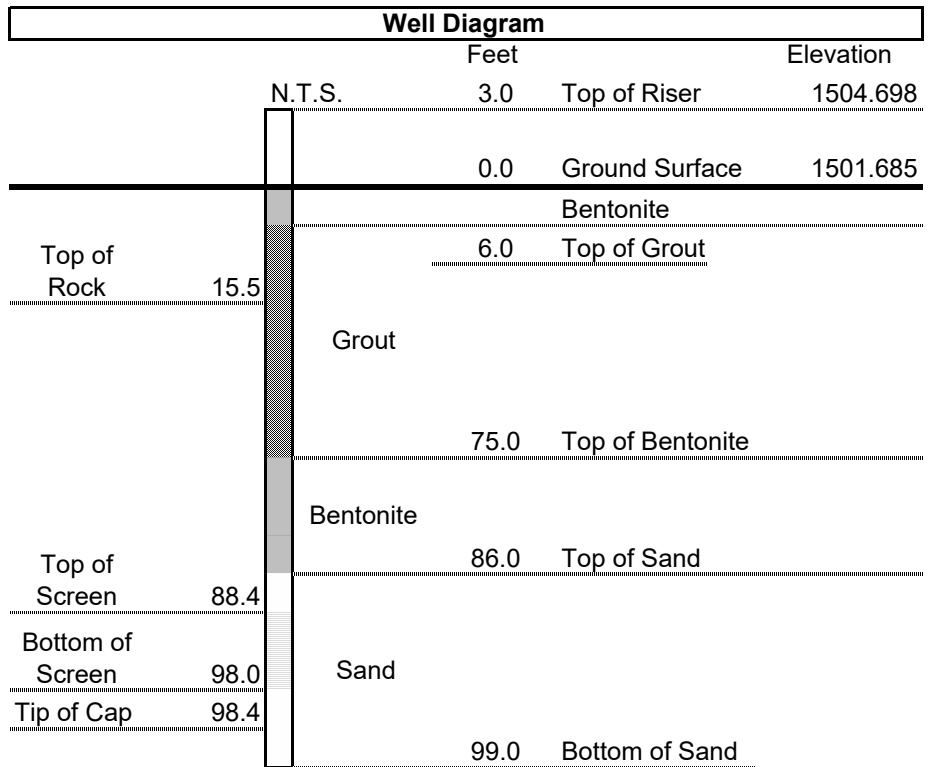
### Monitoring Well Construction Details

Page 1 of 1

Date Set Start: 5/9/2022 Surface Comp: Concrete Grout: Cetco Pure Gold Volclay 30%  
Set By: Zach Racer (AEP) Pipe Size: 2.0" Sand: Global #5 3/29A  
Datum: Ground Surface Screen Size: 0.01" Bentonite: 3/8" TRO Pel Plug Coated Pellets

Well Survey Information	
Top of Well Casing Elevation	<u>1504.698</u>
Concrete Pad Elevation	<u>1501.862</u>
Ground Surface Elevation	<u>1501.685</u>
Northing Top of Well Riser	<u>3,521,867.071</u>
Easting Top of Well Riser	<u>10,403,426.914</u>

Well Construction Information	
Depth to Bed Rock	<u>15.5</u>
Depth of Boring - NQ	<u>98.4</u>
Depth of Boring - 6" Over Drill	<u>99.0</u>
Bentonite	<u>0.0</u> to <u>6.0</u>
Grout	<u>6.0</u> to <u>75.0</u>
Bentonite	<u>75.0</u> to <u>86.0</u>
Sand	<u>86.0</u> to <u>99.0</u>
Comp. Stickup	<u>3.0</u> to <u>0.0</u>
Riser Pipe to GS	<u>0.0</u> to <u>88.4</u>
Screen	<u>88.4</u> to <u>98.0</u>
Pipe Cap at	<u>98.0</u> to <u>98.4</u>



COMMENTS: 250 lbs sand, 150 lbs bentonite, 50 gal grout, 400 lbs bentonite

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Logged by: Leslie Montoya

Checked by: Jason Monk



# MONITORING WELL CONSTRUCTION LOG

**PROJECT NAME:** AEP Clinch River Pond 1 NES  
**PROJECT LOCATION:** Carbo, VA  
**WOOD PROJECT #:** 3050190394.11.\*\*\*\*

**BORING NO:** W-2204  
**ELEVATION (G.S.):** 1754.058  
**DATE DRILLED:** 4/12/2022 to 4/13/2022  
**DATE WELL CONST.:** 5/3/2022 to 6/8/2022

### Monitoring Well Construction Details

Page 1 of 1

Date Set Start: 5/3/2022 Surface Comp: Concrete Grout: Cetco Pure Gold Volclay 30%  
Set By: Zach Racer (AEP) Pipe Size: 2.0" Sand: Global #5 3/29A  
Datum: Ground Surface Screen Size: 0.01" Bentonite: 3/8" TRO Pelplug Coated Pellets

Well Survey Information	
Top of Well Casing Elevation	<u>1756.806</u>
Concrete Pad Elevation	<u>1754.004</u>
Ground Surface Elevation	<u>1754.058</u>
Northing Top of Well Riser	<u>3,522,273.967</u>
Easting Top of Well Riser	<u>10,401,270.229</u>

Well Construction Information	
Depth to Bed Rock	<u>10.5</u>
Depth of Boring - NQ	<u>74.0</u>
Depth of Boring - 6" Over Drill	<u>72.0</u>
Bentonite	<u>0.0</u> to <u>20.0</u>
Grout	<u>20.0</u> to <u>48.0</u>
Bentonite	<u>48.0</u> to <u>58.0</u>
Sand	<u>58.0</u> to <u>72.0</u>
Comp. Stickup	<u>2.7</u> to <u>0.0</u>
Riser Pipe to GS	<u>0.0</u> to <u>60.4</u>
Screen	<u>60.4</u> to <u>70.0</u>
Pipe Cap at	<u>70.0</u> to <u>70.4</u>

Well Diagram			
	Feet		Elevation
	N.T.S.	Top of Riser	<u>1756.806</u>
	2.7		
	0.0	Ground Surface	<u>1754.058</u>
Top of Rock	<u>10.5</u>	Bentonite	
	20.0	Top of Grout	
	48.0	Top of Bentonite	
Top of Screen	<u>60.4</u>	Bentonite	
	58.0	Top of Sand	
Bottom of Screen	<u>70.0</u>	Sand	
Tip of Cap	<u>70.4</u>		
	72.0	Bottom of Sand	

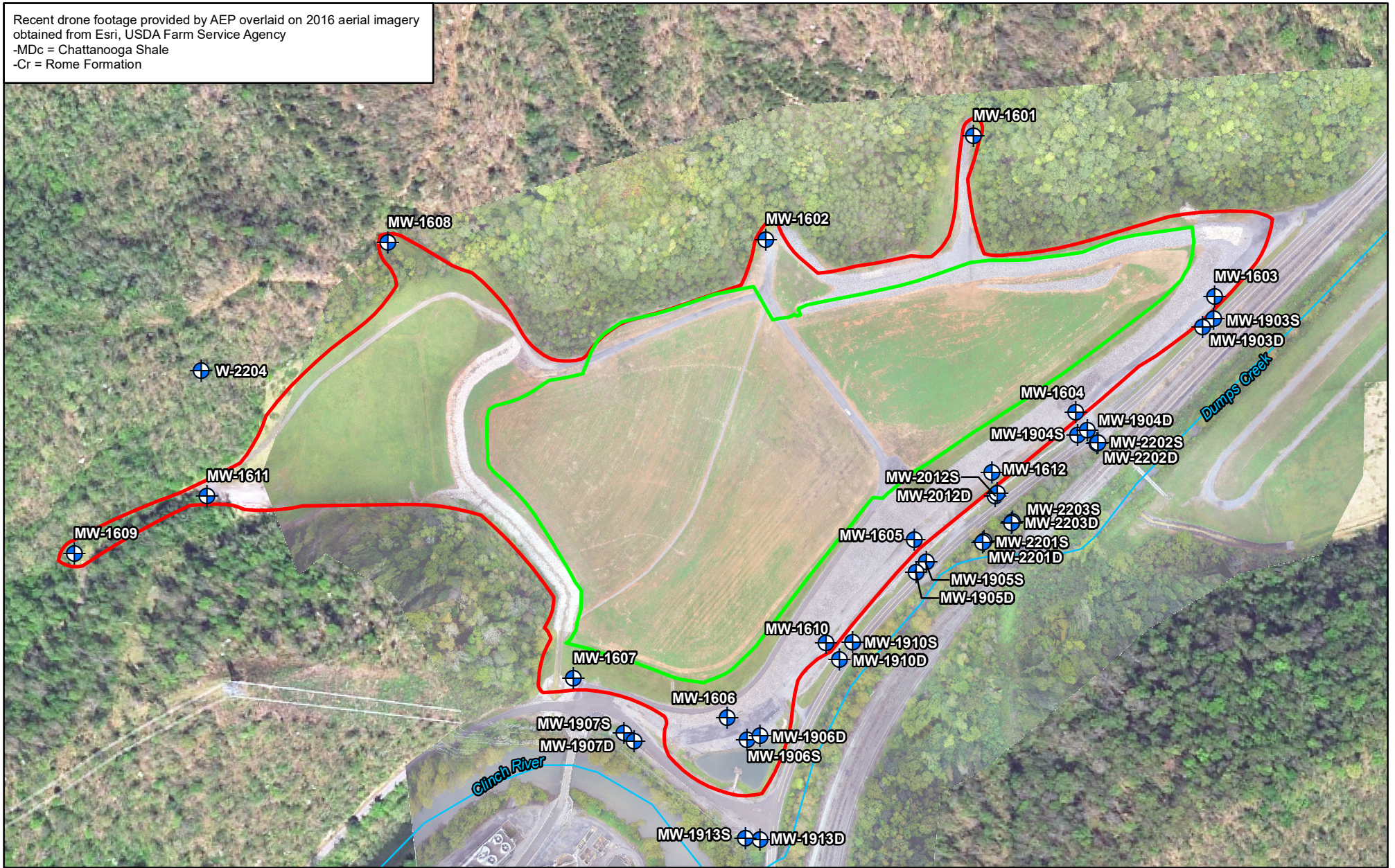
COMMENTS: Noted void (loss of water) at ~41.5' while drilling borehole. Grout got to ~15' and dissappeared into suspected void. 300 lbs sand, 150 lbs bentonite, 300 gal grout, 500 lbs bentonite.

Logged by: Leslie Montoya





Checked by: Jason Monk



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	