Annual Groundwater Monitoring Report

Public Service Company of Oklahoma

Northeastern Power Station

Landfill CCR Management Unit

Permit Number: FA3566010

7300 E HWY 88

Oologah, Oklahoma

January 31, 2025

Prepared by:
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PUBLIC SERVICE COMPANY OF OKLAHOMA℠

An AEP Company

BOUNDLESS ENERGY℠

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Abbreviations:
ASD - Alternate Source Demonstration
CCR – Coal Combustion Residual
GWPS - Groundwater protection standards
LF – Landfill
NPS – Northeastern Power Station
SSI - Statistically Significant Increase

I. Overview

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year for an existing Coal Combustion Residual (CCR) unit at Public Service Company of Oklahoma's (PSO's), a wholly owned subsidiary of American Electric Power Company (AEP), Northeastern Power Station (NPS). The Oklahoma Department of Environmental Quality (ODEQ) CCR rules require that the Annual Groundwater Monitoring Report be posted to the operating record for the preceding year no later than January 31, 2024.
In general, the following activities were completed:

- At the start of the current annual reporting period, the LF was operating under the Detection monitoring program.
- At the end of the current annual reporting period, the LF was operating under the Detection monitoring program.
- A statistical process in accordance with OAC 252:517 to evaluate groundwater data was updated, certified, and posted to AEP's CCR website in 2022 titled: *Statistical Analysis Plan (*Geosyntec Nov 2021). The statistical process was guided by USEPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* ("Unified Guidance," USEPA, 2009). This report was approved by ODEQ January 20, 2022.
- Semi-Annual groundwater samples were collected and analyzed for Appendix A constituents, as specified in OAC 255:517-9-5 Detection Monitoring program and AEP's *Groundwater Sampling and Analysis Plan* (2021).
- The background data was re-established in December 2024.
- Data and statistical analysis not available for the previous reporting period indicated that during the 2nd semi-annual 2023 sampling event (November and December 2023):
    - No SSIs were detected.
- During the 1st semi-annual 2024 sampling event (April and August 2024):
    - Potential SSIs were identified for:
        - Boron at MW-3D, MW-4D, MW-6D, MW-9D, MW-12D, and MW-15
        - Sulfate at MW-3D, MW-4D, MW-5D, MW-6D, MW-9D, MW-12D, and MW-15
- Statistical evaluation of the 2nd semi-annual 2024 groundwater sampling event (October 2024) is underway.

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

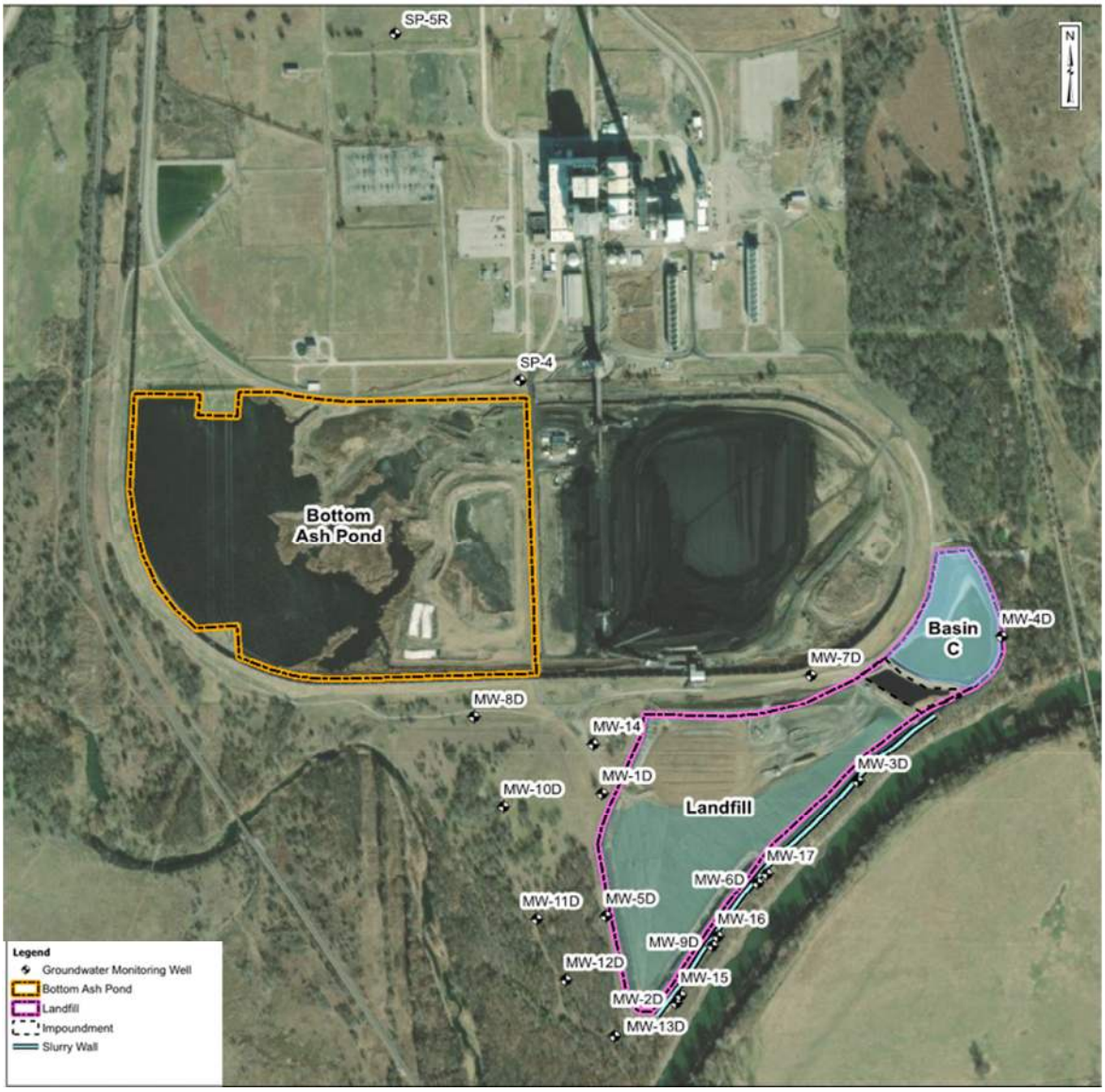
- A map, aerial photograph or a drawing showing the LF CCR management unit, all groundwater monitoring wells and monitoring well identification numbers;
- All of the monitoring data collected, including the rate and direction of groundwater flow, plus a summary showing the number of samples collected per monitoring well, the dates the samples were collected and whether the sample was collected as part of detection monitoring programs is included in Appendix 1;
- Statistical comparison of monitoring data to determine if there have been SSI(s) (Attached as Appendix 2, where applicable);
- A discussion of whether any alternate source demonstrations (ASDs) were performed, and the conclusions (Attached as Appendix 3, where applicable);
- A summary of any transition between monitoring programs or an alternate monitoring frequency (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 field sheets, analytical reports, etc., (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

The figure that follows depicts the PE-certified groundwater monitoring network, the monitoring well locations and their corresponding identification numbers.

Landfill Monitoring Wells	
Background	**Down Gradient**
SP-4	MW-1D through MW-6D,
SP-5R	MW-9D through MW-13D
	MW-14 through MW-17



III. Monitoring Wells Installed or Decommissioned

There were no groundwater monitoring wells installed or decommissioned during this reporting period.

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

Appendix 1 contains tables showing the applicable groundwater quality data obtained under OAC 252:517-9-4 through 252:517-9-5 relevant to this reporting period. Static water elevation data from each monitoring event also are shown in Appendix 1, along with the groundwater velocity calculations groundwater flow directions and potentiometric maps developed after each sampling event.

The site-wide groundwater flow velocity varies from the velocity computed in residence time calculations because assumptions used in these calculations vary based on the scale of the application of groundwater flow. The site-wide groundwater flow velocity is determined as a representative average over the entire CCR unit, which is a large area (multiple acres) consisting of different rock formations. The residence time calculation is a localized estimate use to establish the residence time of groundwater within a single well (<100 sq ft). The site-wide groundwater flow velocity utilizes the maximum and minimum hydraulic gradient based on groundwater elevation differences between two widely spaced site monitoring wells. For a localized hydraulic gradient, the residence time calculations use the elevation difference between the target monitoring well and the nearest groundwater elevation contour line. Additionally, the hydraulic conductivity and effective porosity used in the site-wide groundwater flow velocity are represented by average parameters based on field tests conducted at the Unit. The residence time calculation uses an estimated hydraulic conductivity and effective porosity from a reference work representative of the formation in contact with the well.

Appendix 6 contains the field sheets and laboratory analytical reports that are available for this reporting period.

V. Groundwater Quality Data Statistical Analysis

Semi-Annual groundwater samples were collected and analyzed for Appendix A constituents, as specified in OAC 255:517-9-5 Detection Monitoring program and AEP's *Groundwater Sampling and Analysis Plan* (2021) and approved by ODEQ January 20, 2022.

ODEQ issued a Notice of Deficiency (NOD) January 30, 2020, for the boron ASD submitted October 2018, which presented revised statistical results through intra-well analysis. ODEQ agreed that a statistical error had occurred related to inappropriate background wells MWs 7D and 8D and

background concentrations could not be established; therefore prior to instituting an assessment monitoring program, a background well or wells representative of the aquifer must be established. Monitoring wells MW-18 and MW-19 were installed in 2022 and groundwater samples were collected in 2023. Due to water quality issues with MWs 18 and 19, AEP agreed to utilize existing background wells associated with the Northeastern Bottom Ash Pond, SP-4 and SP-5R as background wells for the landfill in October 2024, statistical analysis will be completed using both intra-well and inter-well comparisons when appropriate.

- Data and statistical analysis not available for the previous reporting period and certified February 20, 2024, indicated that during the 2nd semi-annual 2023 groundwater sampling event conducted October 10, 2023, with 2 of 2 confirmatory sampling conducted December 28, 2023:
    - No potential SSIs were identified.
- During the 1st semi-annual 2024 sampling event conducted April 16, 2024, with 2 of 2 confirmatory sampling conducted August 26, 2024, and certified December 11, 2024:
    - Potential SSIs were identified for:
        - Boron at MW-3D, MW-4D, MW-6D, MW-9D, MW-12D, and MW-15
        - Sulfate at MW-3D, MW-4D, MW-5D, MW-6D, MW-9D, MW-12D, and MW-15
- The 2nd semi-annual 2024 statistical evaluation for the groundwater samples collected on October 22, 2024, is underway.

The statistical reports available for this reporting period are found in Appendix 2.

VI. Alternate Source Demonstrations

No alternate source demonstrations (ASDs) have been completed at this time. If a successful ASD cannot be prepared, the unit will move to assessment monitoring by notifying DEQ within 90 days of the statistical analysis certification.

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

This CCR Unit remained in detection monitoring throughout 2024.

The semi-annually sampling frequency will be maintained for the current monitoring program.

VIII. Other Required Information

Financial Assurance – Corporate Financial Test was accepted by ODEQ in correspondence dated May 9, 2024. The background data was re-established in December 2024.

IX. Description of Any Problems Encountered and Actions Taken

As required by OAC 252:517-9-1(b)(1)(c), a minimum of eight independent samples are to be collected from each downgradient well within the monitoring well network. NPS continues to attempt to collect background data from wells 1D, 2D, 9D, 10D, 11D, 13D, 14, 16, and 17, which often lack sufficient water volume for sample collection after allowing for 24 hours of recharge.

Of these wells:

During the 1st semi-annual sampling event, groundwater samples were successfully collected from monitoring wells 2D, 9D, 13D, and 14 for Appendix A parameters and wells 2D, 13D, and 14 for Appendix B parameters except Radium.

During the 2nd semi-annual sampling event, groundwater samples were successfully collected from monitoring wells 9D, 13D and 14 for Appendix A parameters and wells 13D, and 14 for Radium.

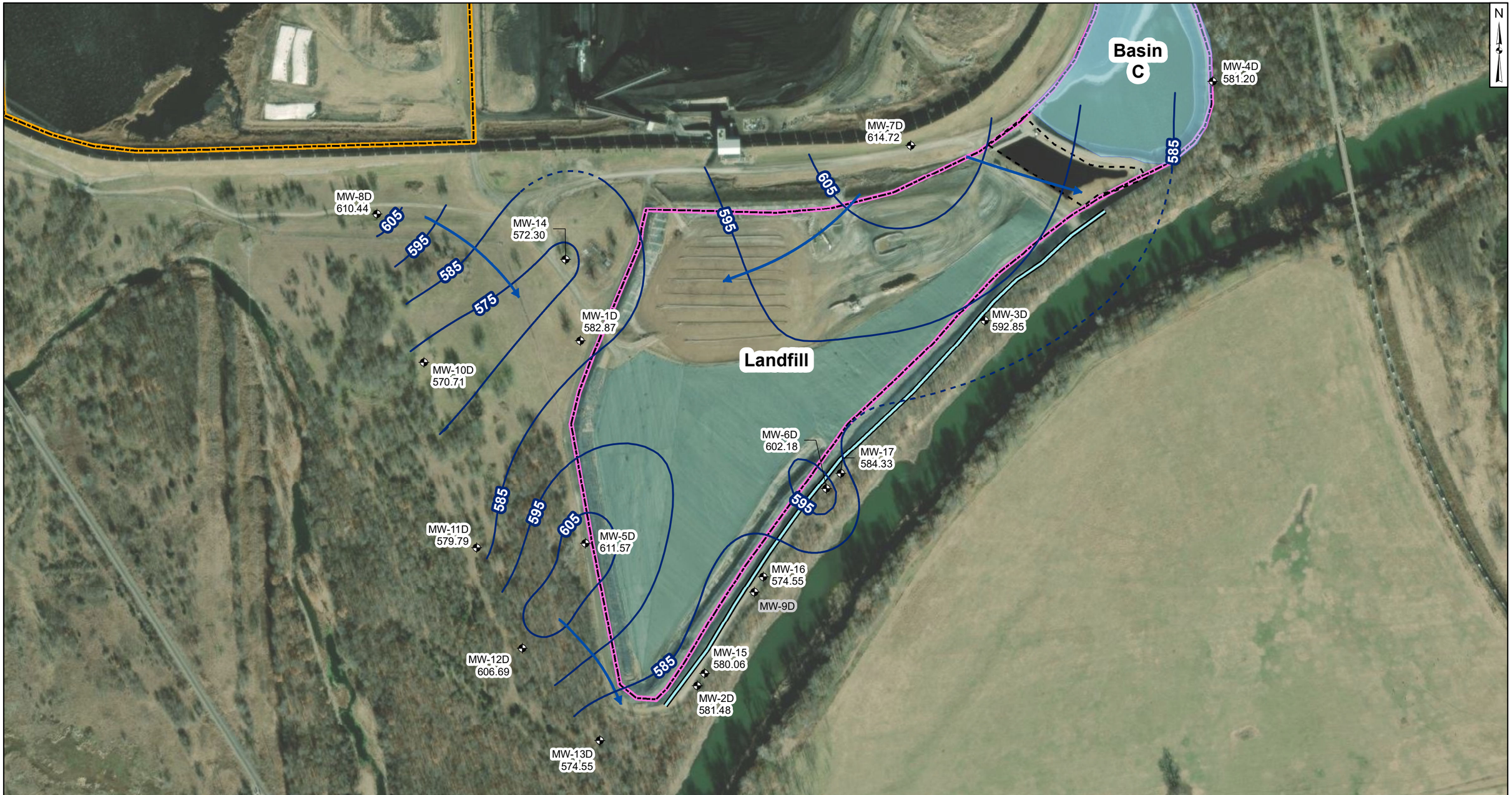
X. A Projection of Key Activities for the Upcoming Year

Key activities for the upcoming year include:

- As required by OAC 252:517-9-5, conduct detection monitoring of the groundwater for the LF CCR unit on a semi-annual bases;
- Evaluation of the detection monitoring results from a statistical analysis viewpoint, looking for SSIs above background;
- Complete ASDs for potential SSIs, as needed, and submit to ODEQ for approval;
- Update the Groundwater Monitoring Well Network Report
- Preparation of the next annual groundwater report.

APPENDIX 1

Potentiometric Maps and Tables follow, showing the groundwater monitoring data collected, the rate and direction of groundwater flow, and a summary showing the number of samples collected per monitoring well. The dates that the samples were collected also is shown.



Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- Bottom Ash Pond
- Landfill
- Impoundment
- Slurry Wall

Notes

1. Monitoring well coordinates and water level data (collected April 16, 2024) provided by AEP.
2. Groundwater elevation units are feet above mean sea level (ft amsl).
3. Wells not used for contouring are highlighted in gray.
4. MW-9D (586.01 ft amsl) was not used for contouring due to an anomalous reading.
5. River water elevation was 533.19 ft amsl on April 16, 2024 (USGS 07178452).
6. Satellite imagery provided by ESRI (December 2023).

500 250 0 500 Feet

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Oklahoma Firm Certificate of Authorization No. 1996 Exp. 6/30/2026

Potentiometric Map - Uppermost Aquifer
April 2024

AEP Northeastern Power Plant - Landfill
Oologah, Oklahoma

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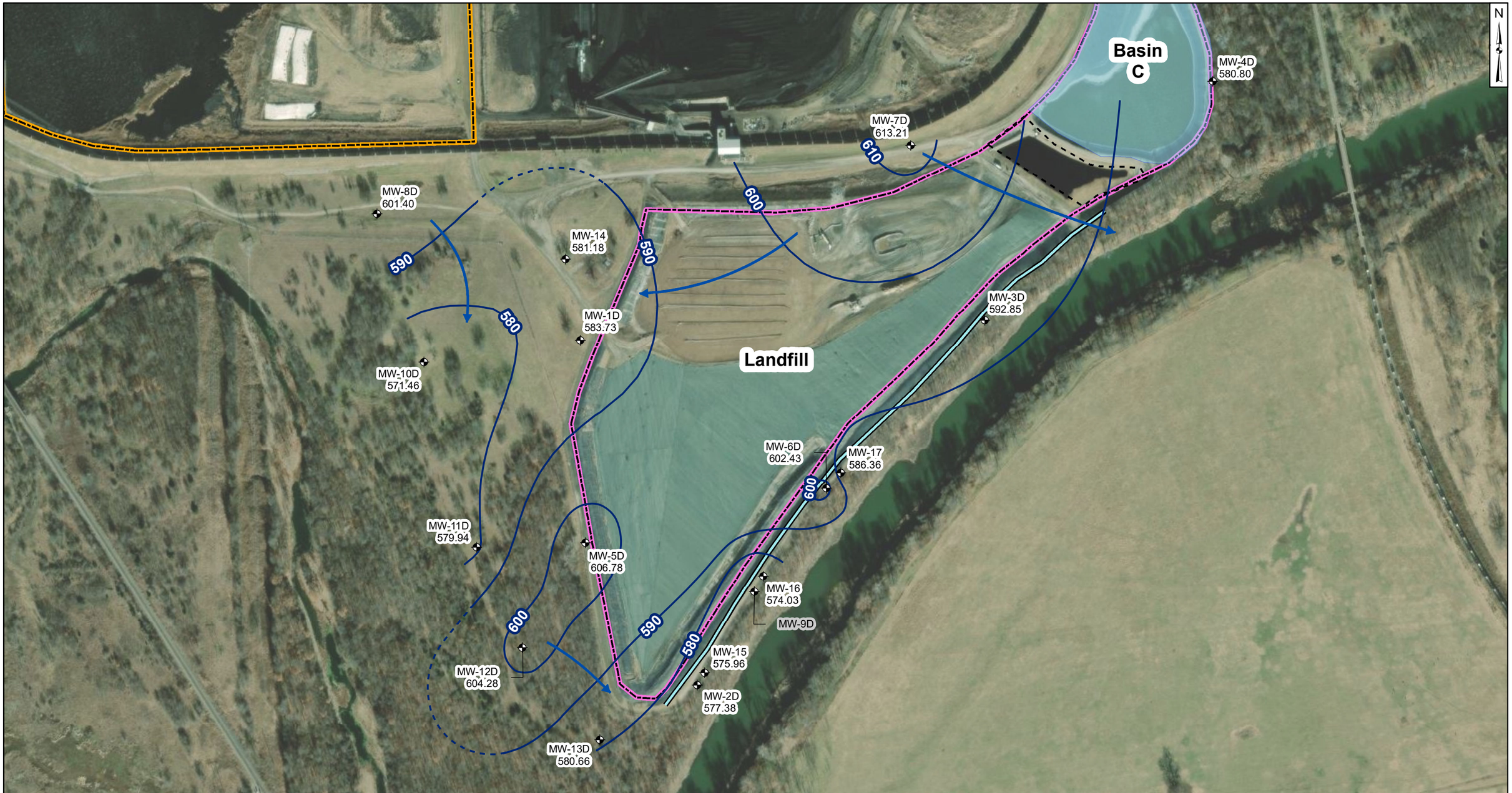
Figure **1**

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Northeastern\2024\AEP-Northeastern_LF_2024-04_Apr_v1.mxd. ASoltero. 1/14/2025. Project/Phase/Task.



Legend

- Groundwater Monitoring Well
- Groundwater Elevation Contour
- Groundwater Elevation Contour (Inferred)
- Approximate Groundwater Flow Direction
- Bottom Ash Pond
- Landfill
- Impoundment
- Slurry Wall

Notes

1. Monitoring well coordinates and water level data (collected October 22, 2024) provided by AEP.
2. Wells not used for contouring are highlighted in gray.
3. Groundwater elevation units are feet above mean sea level (ft amsl).
4. MW-9D (592.11 ft amsl) was not used for contouring due to an anomalous reading.
5. River water elevation was 532.62 ft amsl on October 22, 2024 (USGS 07178452).
6. Satellite imagery provided by ESRI (December 2023).

500 250 0 500 Feet

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Potentiometric Map - Uppermost Aquifer October 2024

AEP Northeastern Power Plant - Landfill
Oologah, Oklahoma

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Figure 2

A:\Projects\AEP\Groundwater Statistical Evaluation - CHA8423\Groundwater Mapping\GIS Files\MXD\Northeastern\2024\AEP-Northeastern_LF_2024-10_Oct.mxd. ASoltero. 1/14/2025. Project/Phase/Task.

Table 1: Residence Time Calculation Summary
Northeastern Landfill

Geosyntec Consultants, Inc.

			2024-04		2024-08[3]		2024-10	
CCR Management Unit	Monitoring Well	Well Diameter (inches)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Landfill	MW-3D [2]	2.0	0.7	84	0.5	132	0.7	83
	MW-4D [2]	2.0	0.8	79	0.4	170	0.7	82
	MW-5D [2]	2.0	1.9	31	1.3	48	1.7	36
	MW-6D [2]	2.0	1.9	31	0.8	76	5.2	12
	MW-7D [1]	2.0	1.0	61	NC	NC	1.0	61
	MW-8D [1]	2.0	2.4	26	NC	NC	1.5	40
	MW-9D [2]	2.0	NC	NC	0.8	74	NC	NC
	MW-12D [2]	2.0	1.8	34	0.9	65	1.7	35
	MW-15 [2]	2.0	1.0	58	1.6	37	1.2	51

Notes:
[1] - Observation Well
[2] - Downgradient Well
[3] - Only select wells were gauged as part of two-of-two verification sampling
NC - Not Calculated

Table 1. Groundwater Data Summary: SP-4
Northeastern - LF
Appendix A Constituents

Geosyntec Consultants, Inc.

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	Total Dissolved Solids
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
1/25/2017	Background	0.406	57.7	401	3	7.7	37	1,122
3/15/2017	Background	0.399	67	52	4	--	38	1,128
4/25/2017	Background	0.442	58.8	459	3.2	7.0	41	1,128
5/18/2017	Background	0.411	296	232	2.1	--	50	846
6/15/2017	Background	0.395	118	475	3.34	8.3	36	1,164
6/27/2017	Background	0.388	110	471	3.2489	8.1	37	1,388
7/12/2017	Background	0.42	648	489	3.863	8.1	36	1,128
8/4/2017	Background	0.412	1,920	469	3.078	7.7	50	1,150
8/17/2017	Background	0.493	793	460	3.049	7.8	75	1,132
8/30/2017	Background	0.392	612	576	4.086	7.6	74	1,400
9/13/2017	Background	0.387	810	450	3.199	7.7	88	1,236
9/20/2017	Background	0.477	630	440	1.747	7.2	90	1,208
10/11/2017	Background	0.425	206	431	3.7702	7.4	78	1,200
5/30/2018	Background	--	--	--	4.169	7.4	--	--
7/30/2018	Background	0.399	164	521	< 0.083 U1	7.6	70	1,180
2/27/2019	Background	0.370	85.6	470	3.26	7.4	61.5	1,122
6/20/2019	Background	0.325	56.4	450	3.24	7.1	58.0	1,128
8/26/2019	Background	0.365	182	458	2.99	8.8	61	1,170
3/25/2020	Background	0.340	59.6	476	3.29	9.1	68.6	1,130
6/30/2020	Background	0.338	80.5	531	3.16	9.0	70.2	1,160
10/21/2020	Background	0.333	63.9	441	3.24	8.9	70.4	1,150
3/3/2021	Background	0.347	58.7	--	3.50	7.8	--	--
4/12/2021	Background	0.393	70.8	495	3.49	7.7	68.1	1,160
12/28/2021	Background	0.342	88.7	458	3.24	7.4	79.6	1,100
6/14/2022	Background	0.367	70.2	452	3.25	7.8	80.4	1,160 L1
11/8/2022	Background	0.354	97.6	447	3.23	7.4	81.9	1,150
6/20/2023	Background	0.323	82.1	468	3.29	7.5	83.0	1,170
10/10/2023	Background	0.339	90.9	450	3.19	7.6	81.4	1,160
4/16/2024	Detection	0.337	108 M1	450	3.22	7.6	81.0	1,270
10/22/2024	Detection	0.346	98	448	3.22	7.9	79.4	1,120

Table 1. Groundwater Data Summary: SP-4
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
1/25/2017	Background	< 5 U1	< 5 U1	398	< 1 U1	< 1 U1	< 1 U1	< 5 U1	4.00	3	< 5 U1	0.072	< 0.025 U1	< 5 U1	< 5 U1	< 2 U1
3/15/2017	Background	< 5 U1	< 5 U1	477	< 1 U1	< 1 U1	< 1 U1	< 5 U1	3.57	4	< 5 U1	0.073	< 0.025 U1	< 5 U1	< 5 U1	< 2 U1
4/25/2017	Background	1.36 J1	1.72 J1	578	0.03 J1	0.1 J1	0.64 J1	1.01 J1	2.566	3.2	< 0.68 U1	0.06973	< 0.005 U1	1.5 J1	< 0.99 U1	1.21 J1
5/18/2017	Background	2.04 J1	5.5	762	0.56 J1	0.57 J1	10.73	5.49	6.37	2.1	3.65 J1	0.07998	0.015 J1	1.02 J1	< 0.99 U1	< 0.86 U1
6/15/2017	Background	1.74 J1	4.59 J1	633	0.34 J1	< 0.07 U1	4.04	4.63 J1	4.18	3.34	1.39 J1	0.07422	< 0.005 U1	0.65 J1	1.67 J1	< 0.86 U1
6/27/2017	Background	< 0.93 U1	2.01 J1	576	0.24 J1	< 0.07 U1	2.98	5.29	9.64	3.2489	0.96 J1	0.07041	< 0.005 U1	0.46 J1	< 0.99 U1	< 0.86 U1
7/12/2017	Background	2.66 J1	10.65	1,340	1.28	1.37	22.48	10.64	5.79	3.863	8.47	0.09243	0.01 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/4/2017	Background	3.87 J1	44.98	4,590	4.97	6.55	84.15	40.69	4.04	3.078	36.63	0.136	0.058	5.03	4.99 J1	< 0.86 U1
8/17/2017	Background	< 0.93 U1	19.31	2,310	2.12	2.05	41.82	17.86	6.71	3.049	10.7	0.111	0.03	4.23 J1	1.04 J1	< 0.86 U1
8/30/2017	Background	2.45 J1	9.13	1,490	1.26	1.66	25.81	12.06	8.09	4.086	7.11	0.0962	0.021 J1	4.61 J1	1.86 J1	< 0.86 U1
9/13/2017	Background	< 0.93 U1	16.34	1,910	1.71	2.47	30.83	17.71	5.92	3.199	8.92	0.104	0.029	6.21	1.65 J1	< 0.86 U1
9/20/2017	Background	2.3 J1	13.95	1,930	1.77	1.9	34.55	16.32	--	1.747	9.6	0.101	0.014 J1	7.02	< 0.99 U1	< 0.86 U1
5/30/2018	Background	5.14	< 1.05 U1	268	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.49 J1	3.186	4.169	< 0.68 U1	0.06851	< 0.005 U1	3.7 J1	< 0.99 U1	1.62 J1
7/30/2018	Background	0.37	1.14	303	0.078	0.07	0.562	0.497	4.85	< 0.083 U1	0.356	0.0627	0.006 J1	3.63	0.7	0.05 J1
2/27/2019	Background	0.3 J1	1 J1	276	< 0.2 U1	< 0.1 U1	5.71	< 0.2 U1	3.144	3.26	< 0.2 U1	0.0602	< 0.005 U1	< 4 U1	0.6 J1	< 1 U1
6/20/2019	Background	0.3 J1	0.83	337	< 0.1 U1	0.07 J1	1.06	0.388	3.751	3.24	1.07	0.068	0.007 J1	2 J1	0.4 J1	< 0.5 U1
8/26/2019	Background	0.25	1.64	359	0.101	0.05	1.01	1.07	3.24	2.99	0.596	0.0554	< 0.005 U1	2 J1	0.6	< 0.1 U1
3/25/2020	Background	0.28	0.83	327	0.04 J1	0.04 J1	0.332	0.166	4.28	3.29	0.2 J1	0.0535	< 0.002 U1	4.07	0.7	< 0.1 U1
6/30/2020	Background	0.32	1.52	334	0.118	0.04 J1	1.09	1.28	4.16	3.16	0.527	0.0564	< 0.002 U1	3.57	0.7	< 0.1 U1
10/21/2020	Background	0.29	1.03	322	0.06 J1	0.07	0.523	0.508	3.42	3.24	0.359	0.0559	< 0.002 U1	3.24	0.7	< 0.1 U1
3/3/2021	Background	0.27	0.99	367	0.04 J1	0.06	0.449	0.207	5.49	3.50	1.17	0.0594	< 0.002 U1	3.60	0.6	< 0.1 U1
4/12/2021	Background	0.22	1.41	435	0.09 J1	0.04 J1	1.03	0.921	4.09	3.49	0.392	0.0613	< 0.002 U1	2.94	0.4 J1	< 0.04 U1
12/28/2021	Background	0.26	0.76	304	0.033 J1	0.035	0.47	0.240	4.48	3.24	0.14 J1	0.0529	< 0.002 U1	3.0	0.48 J1	< 0.04 U1
6/14/2022	Background	0.21	0.80	246	0.04 J1	0.024	0.56	0.159	3.56	3.25	0.10 J1	0.0571	< 0.002 U1	3.7	0.38 J1	< 0.04 U1
11/8/2022	Background	0.23	0.92	214	0.053	0.059	1.19	0.345	6.29	3.23	0.38	0.0579	< 0.002 U1	3.5	0.39 J1	< 0.04 U1
6/20/2023	Background	0.192	1.26	204	0.074	0.044	0.61	0.470	7.96	3.29	0.21	0.0507	< 0.002 U1	2.8	0.41 J1	0.02 J1
10/10/2023	Background	0.249	0.84	232	0.036 J1	0.057	0.59	0.218	3.23	3.19	0.38	0.0554	< 0.002 U1	3.3	0.30 J1	0.02 J1
4/16/2024	Detection	0.169	0.70	190	0.033 J1	0.019 J1	0.27 J1	0.123	3.49	3.22	0.10 J1	0.0527	< 0.002 H2, Q5, Q1, U1	3.2	0.38 J1	< 0.02 U1
10/22/2024	Detection	0.147	0.70	190	0.038 J1	0.021	0.45	0.146	3.67	3.22	0.09 J1	0.054	< 0.002 U1	2.5	0.28 J1	0.03 J1

Table 1. Groundwater Data Summary: SP-5R
Northeastern - LF
Appendix A 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
1/25/2017	Background	0.233	52.4	500	3	8.0	10	1,354
3/15/2017	Background	0.236	61.7	62	4	--	10	1,420
4/25/2017	Background	0.245	53.8	674	3.06	7.5	9	1,436
5/18/2017	Background	0.319	79.1	1,834	4	--	8	3,008
6/15/2017	Background	0.231	57.1	607	3	8.3	7	1,368
6/27/2017	Background	0.224	53	636	2.835	8.2	8	1,156
7/12/2017	Background	0.261	53.8	640	3.156	8.2	7	1,388
8/4/2017	Background	0.256	61.3	638	2.889	7.9	8	1,372
8/17/2017	Background	0.293	52	661	3.258	8.2	6	1,378
8/30/2017	Background	0.252	57.3	652	3.5698	7.7	7	1,424
9/13/2017	Background	0.232	55.6	644	2.797	8.4	6	1,452
9/20/2017	Background	0.257	53.7	729	1.535	7.4	6	1,312
10/11/2017	Background	0.61	71	630	3.7844	7.5	5	1,368
5/30/2018	Background	--	--	--	4.1115	7.6	--	--
7/30/2018	Background	0.246	131	793	4.3905	8.0	4	1,480
2/27/2019	Background	0.233	72.8	739	3.08	7.7	1.6	1,530
6/20/2019	Background	0.202	48.5	675	3.06	7.3	0.9 J1	1,428
8/26/2019	Background	0.220	128	697	2.789	8.8	3	1,450
3/25/2020	Background	0.214	49.2	790	3.13	8.8	0.8 J1	1,580
6/30/2020	Background	0.211	64.9	840	2.99	9.0	5.1	1,560
10/21/2020	Background	0.188	50.4	584	3.03	8.8	5.0	1,320
3/3/2021	Background	0.188	52.4	--	3.18	7.6	--	--
4/12/2021	Background	0.215	54.6	725	3.20	7.9	7.0	1,420
12/27/2021	Background	0.190	71.7	660	3.09	7.4	6.1	1,370
6/14/2022	Background	0.209	52.5	675	3.09	7.7	4.7	1,410 L1
11/8/2022	Background	0.256	90.2	1,010	3.28	7.4	2.8	1,940
6/20/2023	Background	0.191	94.5	782	3.09	7.5	3.8	1,580
10/10/2023	Background	0.228	107	964	3.21	7.3	2.6	1,830
4/16/2024	Detection	0.189	90.5	690	3.04	7.5	4.4	1,430
10/22/2024	Detection	0.201	82	721	3.06	7.8	2.3	1,430

Table 1. Groundwater Data Summary: SP-5R
Northeastern - LF
Appendix B Constituents

Geosyntec Consultants, Inc.

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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
1/25/2017	Background	< 5 U1	12	1,650	< 1 U1	< 1 U1	< 1 U1	< 5 U1	10.09	3	< 5 U1	0.114	< 0.025 U1	< 5 U1	< 5 U1	< 2 U1
3/15/2017	Background	< 5 U1	13	1,590	< 1 U1	< 1 U1	1	< 5 U1	9.65	4	< 5 U1	0.112	< 0.025 U1	< 5 U1	< 5 U1	< 2 U1
4/25/2017	Background	< 0.93 U1	17.03	1,610	0.03 J1	< 0.07 U1	0.33 J1	0.88 J1	10.27	3.06	< 0.68 U1	0.112	0.016 J1	1.16 J1	< 0.99 U1	< 0.86 U1
5/18/2017	Background	< 0.93 U1	29.42	2,270	0.23 J1	< 0.07 U1	3.41	2.32 J1	15.30	4	2.36 J1	0.163	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/15/2017	Background	2.02 J1	13.7	2,050	0.11 J1	< 0.07 U1	1.42	1.44 J1	10.27	3	< 0.68 U1	0.109	0.016 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/27/2017	Background	< 0.93 U1	12.65	1,790	0.02 J1	< 0.07 U1	0.3 J1	1.01 J1	15.84	2.835	0.76 J1	0.1	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/12/2017	Background	< 0.93 U1	17.24	1,880	0.06 J1	< 0.07 U1	0.5 J1	1.1 J1	12.21	3.156	0.9 J1	0.111	< 0.005 U1	< 0.29 U1	1.14 J1	< 0.86 U1
8/4/2017	Background	< 0.93 U1	21.6	1,800	0.09 J1	< 0.07 U1	1.69	1.32 J1	11.60	2.889	1.44 J1	0.119	0.015 J1	1.27 J1	< 0.99 U1	< 0.86 U1
8/17/2017	Background	1.63 J1	19.11	1,890	0.04 J1	< 0.07 U1	< 0.23 U1	1 J1	10.95	3.258	< 0.68 U1	0.106	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
8/30/2017	Background	< 0.93 U1	19.47	1,930	0.11 J1	< 0.07 U1	1.16	1.2 J1	12.47	3.5698	< 0.68 U1	0.112	0.009 J1	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/13/2017	Background	< 0.93 U1	20.36	1,930	0.1 J1	0.16 J1	0.62 J1	1 J1	10.62	2.797	< 0.68 U1	0.11	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
9/20/2017	Background	< 0.93 U1	20.77	1,880	0.05 J1	< 0.07 U1	< 0.23 U1	0.97 J1	10.50	1.535	1.06 J1	0.111	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
5/30/2018	Background	1.21 J1	28.86	1,760	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.88 J1	9.15	4.1115	< 0.68 U1	0.102	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
7/30/2018	Background	0.05 J1	47.3	2,140	0.052	0.02 J1	0.082	0.482	11.28	4.3905	0.415	0.0946	< 0.005 U1	1.17	0.1	0.02 J1
2/27/2019	Background	< 0.2 U1	25.7	2,130	< 0.2 U1	< 0.1 U1	2 J1	0.3 J1	6.702	3.08	0.7 J1	0.102	< 0.005 U1	< 4 U1	< 0.3 U1	< 1 U1
6/20/2019	Background	< 0.1 U1	59.9	2,410	< 0.1 U1	< 0.05 U1	0.8 J1	0.598	12.977	3.06	0.701	0.111	0.008 J1	< 2 U1	< 0.2 U1	< 0.5 U1
8/26/2019	Background	0.06 J1	49.3	2,340	0.06 J1	0.02 J1	0.335	0.485	11.56	2.789	0.545	0.0928	< 0.005 U1	1 J1	0.1 J1	< 0.1 U1
3/25/2020	Background	0.05 J1	26.2	2,600	0.04 J1	0.02 J1	0.346	0.296	12.09	3.13	0.371	0.0911	< 0.002 U1	1 J1	0.1 J1	< 0.1 U1
6/30/2020	Background	0.13	27.0	2,520	0.151	0.04 J1	1.51	0.774	14.34	2.99	1.65	0.0913	< 0.002 U1	1 J1	0.5	< 0.1 U1
10/21/2020	Background	0.10	10.9	2,070	0.05 J1	< 0.01 U1	0.320	0.378	6.502	3.03	0.373	0.0792	< 0.002 U1	0.8 J1	0.2 J1	< 0.1 U1
3/3/2021	Background	0.16	6.56	1,840	0.05 J1	0.27	0.496	0.391	13.31	3.18	0.793	0.0856	< 0.002 U1	0.7 J1	0.1 J1	< 0.1 U1
4/12/2021	Background	0.09 J1	7.12	2,180	0.05 J1	0.01 J1	0.415	0.378	14.10	3.20	0.325	0.0894	< 0.002 U1	1 J1	0.1 J1	< 0.04 U1
12/27/2021	Background	0.09 J1	10.0	1,840	0.031 J1	0.029	0.26	0.257	13.16	3.09	0.18 J1	0.0766	< 0.002 U1	0.9	< 0.09 U1	< 0.04 U1
6/14/2022	Background	0.19	20.3	2,010	0.07 J1	0.200	0.47	0.699	11.26	3.09	0.66	0.0896	< 0.002 U1	0.9	0.1 J1	< 0.04 U1
11/8/2022	Background	0.16	14.2	2,070	0.066	0.108	0.75	0.511	9.37	3.28	4.34	0.120	< 0.002 U1	0.8	0.11 J1	< 0.04 U1
6/20/2023	Background	0.230	9.09	2,120	0.276	0.074	2.73	1.18	16.19	3.09	2.11	0.0822	< 0.002 U1	0.8	0.91	0.05 J1
10/10/2023	Background	0.195	15.8	2,770	0.201	0.076	2.64	1.03	24.78	3.21	2.52	0.123	< 0.002 U1	0.7	0.94	0.04 J1
4/16/2024	Detection	0.131	6.69	1,970	0.061	0.038	0.45	0.321	8.39	3.04	0.66	0.0856	< 0.002 U1	0.7	0.13 J1	< 0.02 U1
10/22/2024	Detection	0.117	16.1	2,080	0.108	0.038	0.77	0.841	12.38	3.06	1.05	0.086	< 0.002 U1	0.7	0.20 J1	< 0.02 U1

Table 1. Groundwater Data Summary: MW-1D
Northeastern - LF
Appendix A 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
5/30/2018	Background	1.2	135	--	--	7.4	--	--
11/7/2022	Background	1.20	163	237	1.41	7.4	1,330	2,740
12/12/2022	Background	2.22	328	265	1.44	7.5	1,340	3,170
1/24/2023	Background	1.30	186	--	--	7.3	--	--

Table 1. Groundwater Data Summary: MW-1D
Northeastern - LF
Appendix B 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	mg/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/30/2018	Background	4.57 J1	< 1.05 U1	18.1	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.36 J1	--	--	< 0.68 U1	0.05481	< 0.005 U1	10.73	3.11 J1	43
11/7/2022	Background	0.40	1.74	62.9	0.26 J1	0.325	5.38	3.39	--	1.41	4.67	0.114	--	14.2	1.03	0.12 J1
12/12/2022	Background	0.4 J1	23.0	758	3.51	4.80	70.0	52.9	--	1.44	46.2	0.152	0.070 J1	28	9.8	0.9 J1
1/24/2023	Background	0.5 J1	7.9	238	1.33	1.43	29.8	14.3	--	--	14.5	0.0968	0.04 J1	15	3.6 J1	0.4 J1

Table 1. Groundwater Data Summary: MW-2D
Northeastern - LF
Appendix A 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
5/2/2018	Background	10.5	7.52	14	2.028	10.6	628	1,206
5/30/2018	Background	10.1	19.2	--	--	10.4	--	--
2/27/2019	Background	9.67	9.26	16.4	1.56	11.0	612	1,218
8/26/2019	Background	10.7	14.3	12	1.661	12.8	591	1,236
6/29/2020	Background	11.3	11.9	11.5	1.91	13.7	732	1,310
4/13/2021	Background	10.6	12.5	12.1	1.81	11.0	654	1,250
6/14/2022	Background	8.46	18.5	15.5	1.22	10.1	617	1,180 L1
2/21/2023	Background	8.67	8.48	14.9	1.58	10.4	634	1,260
3/8/2023	Background	9.55	9.2	14.0	1.58	10.8	638	1,180
4/10/2023	Background	9.54	75.5	--	--	10.4	--	--
6/20/2023	Background	8.93	14.9	--	--	10.4	--	--
10/10/2023	Background	9.36	10.6	14.5	1.48	10.3	597	1,180
4/16/2024	Background	9.01	13.3	15.6	1.38	10.3	602	1,100

Table 1. Groundwater Data Summary: MW-2D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/2/2018	Background	2.12 J1	37.15	9.62	< 0.02 U1	0.3 J1	< 0.23 U1	0.36 J1	1.259	2.028	< 0.68 U1	0.0006 J1	0.046	588	82.77	1.1 J1
5/30/2018	Background	1.95 J1	34.61	29.17	< 0.02 U1	0.44 J1	1.4	0.3 J1	--	--	1.28 J1	0.00125	0.04	552	72.31	2
2/27/2019	Background	--	--	--	--	--	--	--	--	1.56	--	--	0.028	--	--	--
2/21/2023	Background	0.48	28.2	12.7	0.027 J1	0.191	1.08	0.326	2.24	1.58	1.31	0.0007	0.033	546	63.4	0.14 J1
3/8/2023	Background	0.5 J1	28.2	13.0	< 0.07 U1	0.27	2.1	0.35	1.84	1.58	1.6 J1	0.0015 J1	0.033	524	49.3	< 0.4 U1
4/10/2023	Background	0.61 J1	27.5	43.2	0.09 J1	1.27	15.9	2.12	1.73	--	9.9	0.0016 J1	0.024	491	21.1	0.5 J1
6/20/2023	Background	0.54 J1	25.1	26.3	< 0.07 U1	0.24	2.0 J1	0.47	--	--	2.6	0.0013 J1	0.034	503	18.5	0.3 J1
4/16/2024	Background	0.51 J1	21.2	33.1	0.28 J1	0.36	4.3	0.47	--	1.38	4.4	0.0010 J1	--	455	12.4	0.2 J1

Table 1. Groundwater Data Summary: MW-3D
Northeastern - LF
Appendix A 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
1/25/2017	Background	0.919	111	16	< 1 U1	7.5	174	658
3/14/2017	Background	0.913	120	14	1	--	175	648
4/25/2017	Background	0.972	110	14	0.77 J1	7.9	181	662
5/18/2017	Background	0.789	163	12	< 0.083 U1	--	192	598
6/15/2017	Background	0.873	137	12	0.8472 J1	7.3	225	742
6/27/2017	Background	0.84	194	13	0.7591 J1	7.3	232	766
7/12/2017	Background	0.864	129	13	< 0.083 U1	6.9	210	728
8/4/2017	Background	0.856	135	12	0.7381 J1	6.7	227	710
8/17/2017	Background	0.841	138	23	< 0.083 U1	6.8	213	728
8/30/2017	Background	0.84	136	12	0.7144 J1	6.9	216	696
9/13/2017	Background	0.877	152	11	< 0.083 U1	6.8	212	848
9/20/2017	Background	0.853	139	11	< 0.083 U1	6.9	214	724
10/11/2017	Detection	0.878	134	13	< 0.083 U1	6.9	218	722
5/2/2018	Detection	1.08	127	13	0.757 J1	7.3	196	736
5/30/2018	Detection	0.952	129	13	0.896 J1	7.5	214	724
10/22/2018	Detection	1.02	142	14.89	1.09	7.2	210.57	702
11/28/2018	Detection	0.964	--	--	0.648 J1	8.0	--	--
2/27/2019	Detection	0.973	127	13.2	0.71	7.8	223	700
5/7/2019	Detection	1.56	--	--	--	--	--	--
8/26/2019	Detection	0.979	130	12	0.608 J1	8.5	181	686
12/3/2019	Detection	--	--	--	--	7.4	--	--
6/30/2020	Detection	0.941	116	13.7	0.77	8.6	206	680
10/21/2020	Detection	0.833	120	12.6	0.77	8.7	189	667
12/16/2020	Detection	--	--	--	--	6.9	--	--
4/13/2021	Detection	0.924	114	12.6	0.84	7.4	184	633
12/28/2021	Detection	0.829	114 M1	12.3	0.82	7.1	175	620
6/14/2022	Detection	0.882	124	12.5	0.84	7.2	177	630 L1
11/7/2022	Detection	0.864	121	12.9	0.81	7.2	181	650
6/20/2023	Detection	0.890	103	13.3	0.83	7.2	176	630
10/10/2023	Detection	0.809	113	12.8	0.78	7.6	174	630
4/16/2024	Detection	0.872	116	12.7	0.79	7.5	168	610
8/26/2024	Detection	0.835	--	--	--	7.3	167	--
10/22/2024	Detection	0.815	117	13.0	0.81	7.3	164	590

Table 1. Groundwater Data Summary: MW-3D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
1/25/2017	Background	< 5 U1	< 5 U1	111	< 1 U1	< 1 U1	2	< 5 U1	2.153	< 1 U1	< 5 U1	0.017	< 0.025 U1	< 5 U1	< 5 U1	< 2 U1
3/14/2017	Background	< 5 U1	< 5 U1	100	< 1 U1	< 1 U1	< 1 U1	< 5 U1	1.456	1	< 5 U1	0.016	< 0.025 U1	< 5 U1	< 5 U1	< 2 U1
4/25/2017	Background	< 0.93 U1	3.3 J1	89.64	< 0.02 U1	0.26 J1	0.35 J1	1.3 J1	0.419	0.77 J1	< 0.68 U1	0.01508	< 0.005 U1	1.97 J1	< 0.99 U1	< 0.86 U1
5/18/2017	Background	< 0.93 U1	10.64	1,040	0.92 J1	0.61 J1	18.06	5.32	2.443	< 0.083 U1	3.24 J1	0.01943	0.01 J1	4.15 J1	< 0.99 U1	< 0.86 U1
6/15/2017	Background	1.44 J1	1.48 J1	150	0.08 J1	0.22 J1	1.23	1.09 J1	1.706	0.8472 J1	0.83 J1	0.01451	< 0.005 U1	3.04 J1	< 0.99 U1	< 0.86 U1
6/27/2017	Background	< 0.93 U1	< 1.05 U1	97.64	0.09 J1	0.45 J1	4.8	2.69 J1	2.431	0.7591 J1	2.99 J1	0.01836	0.007 J1	79.28	< 0.99 U1	< 0.86 U1
7/12/2017	Background	< 0.93 U1	< 1.05 U1	118	0.05 J1	0.08 J1	0.41 J1	0.82 J1	14.283	< 0.083 U1	< 0.68 U1	0.01435	< 0.005 U1	3.22 J1	< 0.99 U1	< 0.86 U1
8/4/2017	Background	< 0.93 U1	< 1.05 U1	124	0.07 J1	0.21 J1	0.82 J1	0.84 J1	2.242	0.7381 J1	0.8 J1	0.01344	0.013 J1	3.08 J1	< 0.99 U1	< 0.86 U1
8/17/2017	Background	< 0.93 U1	< 1.05 U1	274	0.17 J1	0.24 J1	3.11	1.83 J1	2.328	< 0.083 U1	< 0.68 U1	0.01495	< 0.005 U1	2.91 J1	1 J1	< 0.86 U1
8/30/2017	Background	< 0.93 U1	2.6 J1	244	0.16 J1	0.33 J1	2.36	1.54 J1	2.215	0.7144 J1	< 0.68 U1	0.01465	< 0.005 U1	2.68 J1	< 0.99 U1	< 0.86 U1
9/13/2017	Background	< 0.93 U1	4.52 J1	430	0.35 J1	0.49 J1	6.32	2.97 J1	1.566	< 0.083 U1	1.55 J1	0.01639	< 0.005 U1	2.74 J1	< 0.99 U1	1.02 J1
9/20/2017	Background	1.63 J1	1.14 J1	267	0.17 J1	0.21 J1	2.74	1.41 J1	2.162	< 0.083 U1	< 0.68 U1	0.01508	< 0.005 U1	3.33 J1	< 0.99 U1	< 0.86 U1

Table 1. Groundwater Data Summary: MW-4D
Northeastern - LF
Appendix A 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
3/15/2017	Background	--	209	25	< 1 U1	--	237	848
5/2/2018	Background	1.21	192	22	< 0.083 U1	7.1	328	984
5/30/2018	Background	1.27	164	20	0.4188 J1	7.0	279	910
6/27/2018	Background	1.16	177	20	< 0.083 U1	7.9	258	882
7/31/2018	Background	1.04	196	31	< 0.083 U1	7.8	294	856
8/30/2018	Background	1.26	183	--	--	8.1	--	886
9/19/2018	Background	1.13	174	31	< 0.083 U1	7.8	260	884
10/15/2018	Background	0.656	195	37.9	< 0.083 U1	7.6	289.3	846
10/22/2018	Background	--	--	39.8	< 0.083 U1	7.9	306	--
11/28/2018	Background	1.24	193	27	0.3357 J1	7.9	295	972
1/15/2019	Detection	1.16	183	24.6	0.37 J1	7.5	417.6	--
2/27/2019	Detection	1.42	187	31.2	0.30	7.7	463	696
5/7/2019	Detection	--	--	--	--	--	419	--
8/26/2019	Detection	0.987	184	23	0.171 J1	8.1	274	830
6/30/2020	Detection	0.988	176	22.2	0.27	8.4	336	867
10/21/2020	Detection	0.761	163	24.3	0.27	8.4	272	813
4/12/2021	Detection	1.20	195	23.0	0.33	7.3	429	979
6/22/2021	Detection	--	--	--	--	7.1	398	--
12/28/2021	Detection	0.881	167	29.4	0.26	6.9	281	810
6/14/2022	Detection	0.865	161	36.3	0.32	7.1	283	850 L1
11/7/2022	Detection	0.762	181	36.9	0.26	7.2	258	810
6/20/2023	Detection	0.723	154	30.0	0.26	7.2	290	790
10/10/2023	Detection	0.789	166	32.5	0.24	7.1	282	810
4/16/2024	Detection	1.01	179	28.4	0.25	7.2	348	940
8/26/2024	Detection	0.642	170	--	--	7.1	270	--
10/22/2024	Detection	0.583	209	37.6	0.25	7.1	302	860

Table 1. Groundwater Data Summary: MW-4D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
3/15/2017	Background	< 5 U1	5	225	< 1 U1	< 1 U1	4	< 5 U1	--	< 1 U1	< 5 U1	--	< 0.025 U1	--	< 5 U1	< 2 U1
5/2/2018	Background	4.05 J1	2.3 J1	171	< 0.02 U1	0.14 J1	1.37	2.36 J1	1.625	< 0.083 U1	1.47 J1	0.00533	< 0.005 U1	6.74	< 0.99 U1	1.19 J1
5/30/2018	Background	< 0.93 U1	< 1.05 U1	173	< 0.02 U1	< 0.07 U1	< 0.23 U1	1.28 J1	1.991	0.4188 J1	< 0.68 U1	0.0033	< 0.005 U1	4.91 J1	< 0.99 U1	2.94
6/27/2018	Background	< 0.93 U1	< 1.05 U1	167	< 0.02 U1	< 0.07 U1	1.93	1.82 J1	1.244	< 0.083 U1	< 0.68 U1	0.00491	< 0.005 U1	4.64 J1	< 0.99 U1	2.94
7/31/2018	Background	0.05	1.25	173	0.01 J1	0.04	< 7 U1	0.521	1.506	< 0.083 U1	0.130	0.00315	< 0.005 U1	4.59	0.2	0.02 J1
8/30/2018	Background	0.1	1.6	163	0.049	0.11	0.551	0.807	0.912	--	0.804	0.00296	0.007 J1	4.48	0.3	0.02 J1
9/19/2018	Background	0.04 J1	1.20	177	0.02 J1	0.03 J1	0.273	0.551	3.91	< 0.083 U1	0.595	0.00289	< 0.005 U1	3.71	0.2	< 0.1 U1
10/15/2018	Background	0.15	2.28	166	0.06 J1	0.16	0.872	0.873	3.056	< 0.083 U1	1.41	0.00336	< 0.005 U1	4.58	0.3	< 0.1 U1
11/28/2018	Background	< 0.1 U1	1.31	171	< 0.1 U1	0.06 J1	0.3 J1	0.677	1.629	0.3357 J1	0.3 J1	0.00378	< 0.005 U1	8 J1	0.2 J1	< 0.5 U1

Table 1. Groundwater Data Summary: MW-5D
Northeastern - LF
Appendix A 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
3/14/2017	Background	--	127	--	--	--	--	--
5/2/2018	Background	0.476	132	25	0.703 J1	7.3	126	636
5/30/2018	Background	0.468	136	24	0.711 J1	7.2	113	628
6/27/2018	Background	0.478	134	26	0.7487 J1	8.2	122	658
7/31/2018	Background	0.491	142	30	0.8769 J1	8.3	662	628
8/30/2018	Background	0.52	158	--	--	8.1	--	648
9/19/2018	Background	0.444	156	30	0.7519 J1	7.7	134	662
10/15/2018	Background	0.439	141	30.2	0.845 J1	7.8	138.7	636
10/22/2018	Background	--	--	30.3	0.806 J1	8.0	138	--
11/28/2018	Background	0.612	143	24	0.371 J1	8.1	143	614
1/15/2019	Detection	0.540	157	24	0.316 J1	7.8	127.6	--
2/27/2019	Detection	0.531	130	26.7	0.50	8.5	153	616
5/7/2019	Detection	--	--	--	--	--	158	--
8/26/2019	Detection	0.568	146	24	0.412 J1	9.8	134	670
12/3/2019	Detection	--	--	--	--	7.2	--	--
6/29/2020	Detection	0.508	124	26.7	0.57	8.7	165	641
10/21/2020	Detection	0.469	122	26.3	0.54	8.8	158	655
4/13/2021	Detection	0.539	131	27.3	0.59	7.6	160	632
12/28/2021	Detection	0.458	123	26.9	0.60	7.1	157	590
6/14/2022	Detection	0.479	131	26.5	0.61	7.4	150	620 L1
11/7/2022	Detection	0.445	123	26.3	0.58	7.1	148	610
6/20/2023	Detection	0.444	113	25.9	0.58	7.3	140	620
10/10/2023	Detection	0.419	121	25.2	0.57	7.4	140	580
4/16/2024	Detection	0.400	115	25.9	0.58	7.4	129	580
8/26/2024	Detection	0.427	--	--	--	7.5	129	--
10/22/2024	Detection	0.409	121	25.6	0.58	7.1	123	560

Table 1. Groundwater Data Summary: MW-5D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
3/14/2017	Background	< 5 U1	< 5 U1	99	< 1 U1	< 1 U1	< 1 U1	< 5 U1	--	--	< 5 U1	--	< 0.025 U1	--	< 5 U1	< 2 U1
5/2/2018	Background	2.91 J1	1.24 J1	127	< 0.02 U1	0.36 J1	0.59 J1	1.14 J1	2.449	0.703 J1	1.01 J1	0.01243	< 0.005 U1	1.33 J1	1.35 J1	1.25 J1
5/30/2018	Background	< 0.93 U1	< 1.05 U1	139	< 0.02 U1	< 0.07 U1	1.53	1.31 J1	3.06	0.711 J1	1.09 J1	0.01199	< 0.005 U1	< 0.29 U1	< 0.99 U1	< 0.86 U1
6/27/2018	Background	2.5 J1	< 1.05 U1	126	< 0.02 U1	< 0.07 U1	0.8 J1	0.63 J1	2.512	0.7487 J1	< 0.68 U1	0.01208	< 0.005 U1	0.96 J1	< 0.99 U1	2
7/31/2018	Background	0.16	1.27	143	0.103	0.21	0.355	0.482	2.876	0.8769 J1	1.43	0.011	< 0.005 U1	1.21	0.4	0.02 J1
8/30/2018	Background	0.1	0.98	111	0.076	0.1	0.518	0.3	2.906	--	0.706	0.0112	0.006 J1	1.24	0.3	0.04 J1
9/19/2018	Background	0.13	1.18	118	0.08 J1	0.09	0.745	0.336	5.163	0.7519 J1	0.720	0.0107	< 0.005 U1	2 J1	0.4	< 0.1 U1
10/15/2018	Background	0.07 J1	0.99	103	0.07 J1	0.08	0.423	0.289	5.319	0.845 J1	0.379	0.00977	< 0.005 U1	1 J1	0.3	< 0.1 U1
11/28/2018	Background	< 0.1 U1	1.15	113	< 0.1 U1	0.06 J1	0.5 J1	0.324	2.393	0.371 J1	0.4 J1	0.0121	< 0.005 U1	0.2 J1	0.3 J1	< 0.5 U1

Table 1. Groundwater Data Summary: MW-6D
Northeastern - LF
Appendix A 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
6/15/2017	Background	3.51	201	28	0.8054 J1	7.5	508	1,054
6/27/2017	Background	0.877	133	29	0.7596 J1	7.9	524	1,024
7/12/2017	Background	3.49	218	30	< 0.083 U1	7.3	504	1,044
8/4/2017	Background	3.64	222	31	0.7656 J1	6.4	532	1,022
8/17/2017	Background	3.55	211	30	0.729 J1	6.9	509	1,016
8/30/2017	Background	3.41	210	30	0.7158 J1	7.2	522	986
9/13/2017	Background	2.96	237	32	0.5406 J1	7.1	521	1,140
9/20/2017	Background	3.81	196	32	< 0.083 U1	7.1	505	1,008
10/11/2017	Detection	3.74	165	29	0.9597 J1	6.9	545	1,032
1/22/2018	Detection	4.24	--	--	0.76 J1	6.9	494	--
5/2/2018	Detection	3.52	173	31	0.806 J1	7.3	406	1,062
5/30/2018	Detection	3.35	269	32	0.9218 J1	7.4	401	1,090
10/22/2018	Detection	4.34	237	31.68	1.28	7.3	471.81	1,152
11/28/2018	Detection	--	--	--	0.844 J1	7.7	--	--
2/27/2019	Detection	3.63	360	26.9	0.89	7.6	496	1,144
5/7/2019	Detection	--	185	--	--	--	--	1,038
8/26/2019	Detection	2.88	181	13	0.634 J1	8.6	401	1,044
12/3/2019	Detection	--	--	--	--	7.5	--	--
6/30/2020	Detection	3.07	180	24.9	0.76	8.8	533	1,080
10/21/2020	Detection	3.00	170	29.9	0.75	8.7	426	1,060
12/16/2020	Detection	--	--	--	--	7.1	--	--
4/13/2021	Detection	3.35	170	28.4	0.93	8.1	478	1,090
12/28/2021	Detection	2.98	163	27.0	0.93	7.1	469	1,040
6/14/2022	Detection	3.04	203	28.7	1.01	7.3	451	1,090 L1
11/7/2022	Detection	3.00	171	30.2	0.92	7.1	455	1,050
6/20/2023	Detection	2.75	161	28.5	0.88	7.1	466	1,070
10/10/2023	Detection	2.56	168	27	0.82	7.6	454	1,030
4/16/2024	Detection	2.57	201	27.1	0.83	7.5	873	1,060
8/26/2024	Detection	2.70	171	--	--	7.5	468	--
10/22/2024	Detection	2.31	90.8	27.0	0.81	7.4	443	1,100

Table 1. Groundwater Data Summary: MW-6D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
6/15/2017	Background	< 0.93 U1	1.99 J1	113	0.18 J1	0.8 J1	5.99	3.73 J1	1.822	0.8054 J1	3.48 J1	0.02203	0.012 J1	85.01	< 0.99 U1	< 0.86 U1
6/27/2017	Background	1.28 J1	< 1.05 U1	170	0.06 J1	0.37 J1	0.86 J1	1.09 J1	1.917	0.7596 J1	0.76 J1	0.01356	< 0.005 U1	2.79 J1	< 0.99 U1	< 0.86 U1
7/12/2017	Background	< 0.93 U1	< 1.05 U1	107	0.22 J1	0.56 J1	6.82	3.82 J1	1.784	< 0.083 U1	5	0.02244	0.007 J1	61.81	< 0.99 U1	< 0.86 U1
8/4/2017	Background	< 0.93 U1	< 1.05 U1	128	0.22 J1	0.93 J1	6.62	3.39 J1	1.115	0.7656 J1	4.96 J1	0.01921	0.016 J1	82.11	< 0.99 U1	< 0.86 U1
8/17/2017	Background	1.26 J1	1.18 J1	99.54	0.19 J1	0.44 J1	6.77	3.07 J1	1.155	0.729 J1	3.25 J1	0.01925	0.011 J1	81.32	< 0.99 U1	< 0.86 U1
8/30/2017	Background	< 0.93 U1	2.06 J1	103	0.22 J1	0.36 J1	6.68	3.03 J1	1.057	0.7158 J1	2.5 J1	0.01829	< 0.005 U1	85.75	< 0.99 U1	< 0.86 U1
9/13/2017	Background	< 0.93 U1	1.19 J1	109	0.31 J1	0.49 J1	8.15	3.71 J1	1.377	0.5406 J1	3.28 J1	0.02105	< 0.005 U1	58	< 0.99 U1	< 0.86 U1
9/20/2017	Background	1.18 J1	1.93 J1	75.04	0.14 J1	0.22 J1	3.86	2.27 J1	1.43	< 0.083 U1	2.33 J1	0.01701	< 0.005 U1	81	< 0.99 U1	< 0.86 U1

Table 1. Groundwater Data Summary: MW-9D
Northeastern - LF
Appendix A 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
6/15/2017	Background	7.09	229	100	0.9857 J1	7.1	781	1,458
6/27/2017	Background	7.01	191	232	0.8986 J1	7.7	876	1,114
7/12/2017	Background	7.63	244	98	2.191	7.4	1,048	2,146
8/4/2017	Background	7.59	337	60	0.6947 J1	7.0	1,217	2,256
8/17/2017	Background	7.46	328	216	0.681 J1	7.1	1,193	2,486
8/30/2017	Background	6.93	354	64	< 0.083 U1	7.3	1,192	2,392
9/13/2017	Background	6.78	366	293	0.37 J1	7.2	1,244	2,826
10/4/2017	Background	6.68	304	180	< 0.083 U1	7.3	1,079	2,296
10/11/2017	Detection	7.07	288	314	1.5191	7.1	1,075	2,188
1/22/2018	Detection	7.43	--	--	--	7.1	--	--
10/22/2018	Detection	7.19	199	106	0.6 J1	7.1	519.42	1,258
2/27/2019	Detection	6.49	155	28.9	0.89	7.6	555	1,174
8/26/2019	Detection	6.95	136	24	0.758 J1	8.8	526	1,084
12/3/2019	Detection	--	--	--	--	7.6	--	--
6/30/2020	Detection	6.51	128	26.2	0.95	10.9	602	1,070
10/21/2020	Detection	6.12	129	25.3	0.97	8.9	547	1,160
12/16/2020	Detection	--	--	--	--	7.5	--	--
4/13/2021	Detection	6.70	158	26.1	0.99	8.2	594	1,180
6/22/2021	Detection	--	--	--	--	7.6	--	--
6/14/2022	Detection	6.19	196	25.9	0.93	7.3	775	1,560 L1
8/15/2022	Detection	--	--	--	--	7.2	--	1,250
11/7/2022	Detection	6.11	160	26.2	0.92	8.5	624	1,270
6/20/2023	Detection	6.12 M1	204 M1	--	--	7.2	--	--
10/10/2023	Detection	5.87	186	25.5	0.8	8.3	783	1,570
12/28/2023	Detection	--	--	--	--	7.4	--	1,210
4/16/2024	Detection	5.67	299	25.0	0.88	7.9	625	1,330
8/26/2024	Detection	5.65	141	--	--	7.8	529	--
10/22/2024	Detection	4.85	91.4	23.4	0.82	8.3	546	1,160

Table 1. Groundwater Data Summary: MW-9D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
6/15/2017	Background	< 0.93 U1	< 1.05 U1	188	0.32 J1	0.81 J1	12.34	6.18	0.931	0.9857 J1	7.02	0.02386	0.009 J1	173	5	< 0.86 U1
6/27/2017	Background	< 0.93 U1	< 1.05 U1	58.15	< 0.02 U1	0.26 J1	0.89 J1	7.14	--	0.8986 J1	1.24 J1	0.01647	< 0.005 U1	166	< 0.99 U1	< 0.86 U1
7/12/2017	Background	< 0.93 U1	< 1.05 U1	69.89	0.05 J1	< 0.07 U1	4.09	5.69	--	2.191	2.36 J1	0.02221	< 0.005 U1	151	1.32 J1	< 0.86 U1
8/4/2017	Background	< 0.93 U1	< 1.05 U1	132	0.17 J1	0.54 J1	7.15	7.34	--	0.6947 J1	4.26 J1	0.02155	0.017 J1	117	3.57 J1	< 0.86 U1
8/17/2017	Background	< 0.93 U1	< 1.05 U1	196	0.22 J1	0.25 J1	9.52	8.17	--	0.681 J1	5.33	0.02401	0.011 J1	98.19	3.53 J1	< 0.86 U1
8/30/2017	Background	< 0.93 U1	< 1.05 U1	323	0.37 J1	0.91 J1	20.06	15.08	--	< 0.083 U1	9.27	0.02964	0.016 J1	93.84	2.94 J1	< 0.86 U1
9/13/2017	Background	< 0.93 U1	< 1.05 U1	399	0.4 J1	0.68 J1	13.34	12.88	--	0.37 J1	8.28	0.03257	0.016 J1	78.39	2.8 J1	< 0.86 U1
10/4/2017	Background	< 0.93 U1	< 1.05 U1	410	0.43 J1	2.4	14.79	8.38	--	< 0.083 U1	9.69	0.03222	0.015 J1	73.77	3.83 J1	< 0.86 U1
12/12/2022	Background	--	--	--	--	--	--	--	1.93	--	--	--	--	--	--	--

Table 1. Groundwater Data Summary: MW-10D
Northeastern - LF
Appendix A 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
5/30/2018	Background	1.15	54.9	--	--	7.5	--	--
6/27/2018	Background	1.16	52.5	--	--	--	--	--
1/24/2023	Background	1.18	89.7	--	--	7.5	--	--

Table 1. Groundwater Data Summary: MW-10D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/30/2018	Background	2.47 J1	< 1.05 U1	102	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.61 J1	--	--	< 0.68 U1	0.451	< 0.005 U1	19.72	7.02	< 0.86 U1
6/27/2018	Background	1.74 J1	1.59 J1	131	< 0.02 U1	< 0.07 U1	< 0.23 U1	1.01 J1	--	--	< 0.68 U1	0.461	< 0.005 U1	16.2	5.03	< 0.86 U1
1/24/2023	Background	0.63	4.87	150	0.150	0.152	32.2	1.32	--	--	0.7 J1	0.362	<0.0018 U1	20.0	7.71	< 0.4 U1

Table 1. Groundwater Data Summary: MW-11D
Northeastern - LF
Appendix A 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
5/30/2018	Background	0.641	114	--	--	7.3	--	--

Table 1. Groundwater Data Summary: MW-11D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/30/2018	Background	< 0.93 U1	1.77 J1	55.76	< 0.02 U1	< 0.07 U1	2.1	0.43 J1	--	--	< 0.68 U1	0.03979	< 0.005 U1	12.14	< 0.99 U1	1.8 J1

Table 1. Groundwater Data Summary: MW-12D
Northeastern - LF
Appendix A 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
3/15/2017	Background	--	76.9	16	2	--	613	1,142
5/2/2018	Background	8.63	184	17	2.199	7.4	541	1,044
5/30/2018	Background	8.35	89.9	91	2.379	7.7	542	1,088
6/27/2018	Background	8.45	74.9	17	1.988	8.2	586	1,070
7/31/2018	Background	8.72	108	22	2.6173	8.7	662	1,034
8/30/2018	Background	9.71	141	--	--	9.2	--	1,050
9/19/2018	Background	9.02	110	21	2.8416	8.1	582	1,052
10/15/2018	Background	8.68	70.0	21	2.99	9.4	561.2	1,060
10/22/2018	Background	--	--	19.44	2.8	9.0	504.3	--
11/28/2018	Background	9.69	103	16	2.2238	8.9	570	1,068
1/15/2019	Detection	9.08	68.0	14.6	2.028	8.1	437.4	--
2/27/2019	Detection	8.88	64.7	16.8	2.11	8.5	564	1,014
8/26/2019	Detection	8.90	96.3	14	1.6	8.7	540	1,018
6/29/2020	Detection	8.04	82.2	15.0	1.92	8.8	602	945
10/20/2020	Detection	7.19	118	16.1	2.06	9.1	585	1,060
4/13/2021	Detection	7.96	79.0	16.1	2.00	8.4	590	1,030
12/27/2021	Detection	6.38	80.7	12.1	1.90	8.3	498	920
6/14/2022	Detection	6.89	68.3	13.4	1.88	8.1	511	940 L1
11/8/2022	Detection	7.11	61.2	13.1	1.93	8.5	507	920
6/20/2023	Detection	6.60	63.5	13.4	1.80	8.3	522	910
10/10/2023	Detection	6.33	59.1	12.5	1.74	8.1	489	850
4/16/2024	Detection	6.64	67.7	13.2	1.63	8.4	502	930
8/26/2024	Detection	6.40	--	--	--	8.4	512	--
10/22/2024	Detection	5.77	101	12.6	1.71	8.2	474	900

Table 1. Groundwater Data Summary: MW-12D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
3/15/2017	Background	< 5 U1	< 5 U1	31	< 1 U1	< 1 U1	< 1 U1	< 5 U1	--	2	< 5 U1	--	< 0.025 U1	--	< 5 U1	< 2 U1
5/2/2018	Background	< 0.93 U1	1.56 J1	121	0.13 J1	0.8 J1	7.95	3.52 J1	1.625	2.199	7.03	0.00841	0.013 J1	693	4.5 J1	< 0.86 U1
5/30/2018	Background	< 0.93 U1	1.24 J1	77.75	< 0.02 U1	0.25 J1	2.74	1.49 J1	1.213	2.379	3.04 J1	0.00608	< 0.005 U1	667	3.88 J1	2.2
6/27/2018	Background	< 0.93 U1	< 1.05 U1	36.18	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.39 J1	1.331	1.988	< 0.68 U1	0.00541	< 0.005 U1	666	1.55 J1	1.99 J1
7/31/2018	Background	0.11	3.00	42.0	0.053	0.07	0.414	0.674	0.721	2.6173	2.32	0.006	< 0.005 U1	818	1.7	0.106
8/30/2018	Background	0.2	3.39	65.8	0.097	0.31	1.82	2.17	3.137	--	5.43	0.00396	< 0.005 U1	872	3.1	0.241
9/19/2018	Background	0.36	4.67	82.6	0.1 J1	0.33	2.03	1.57	4.417	2.8416	5.18	0.00410	0.012 J1	828	2.9	0.2 J1
10/15/2018	Background	0.43	6.46	50.2	0.06 J1	0.20	1.60	1.31	3.541	2.99	3.51	0.00308	0.007 J1	774	4.6	0.3 J1
11/28/2018	Background	0.3 J1	3.99	71.7	0.1 J1	0.33	1.70	0.989	1.486	2.2238	4.12	0.00483	0.007 J1	744	1.9	< 0.5 U1

Table 1. Groundwater Data Summary: MW-13D
Northeastern - LF
Appendix A 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
3/15/2017	Background	--	203	7	< 1 U1	7.5	402	1,116
5/2/2018	Background	1.08	172	5	< 0.083 U1	7.1	354	1,064
5/30/2018	Background	0.864	171	6	0.4361 J1	6.9	343	1,068
6/27/2018	Background	1.35	212	--	--	7.3	--	--
6/29/2020	Background	0.954	188	4.68	0.32	8.3	476	1,100
4/13/2021	Background	1.39	192	5.83	0.46	7.7	519	1,170
12/27/2021	Background	0.832	184	4.82	0.38	7.0	435	1,120
6/14/2022	Background	0.742	167	4.36	0.37	7.3	341	990 L1
11/8/2022	Background	0.752	181	4.41	0.34	7.0	397	1,060
12/12/2022	Background	1.08	199	--	--	7.2	--	--
3/8/2023	Background	1.39	245	--	--	7.0	--	--
6/20/2023	Background	1.74	197	10.8	0.45	7.1	606	1,290
4/16/2024	Background	2.32	212	10.2	0.47	7.2	669	1,320
10/22/2024	Background	0.827	86.0	6.36	0.40	7.3	502	1,160

Table 1. Groundwater Data Summary: MW-13D
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
3/15/2017	Background	< 5 U1	< 5 U1	64	< 1 U1	< 1 U1	2	< 5 U1	--	< 1 U1	< 5 U1	--	< 0.025 U1	--	< 5 U1	< 2 U1
5/2/2018	Background	< 0.93 U1	< 1.05 U1	48.84	< 0.02 U1	0.13 J1	0.8 J1	1.61 J1	3.214	< 0.083 U1	< 0.68 U1	0.02997	< 0.005 U1	12.38	11.93	< 0.86 U1
5/30/2018	Background	< 0.93 U1	< 1.05 U1	76.07	0.03 J1	< 0.07 U1	1.48	4.37 J1	4.03	0.4361 J1	< 0.68 U1	0.03287	< 0.005 U1	13.07	11.96	< 0.86 U1
6/27/2018	Background	< 0.93 U1	1.13 J1	119	0.12 J1	< 0.07 U1	3.74	4.96 J1	--	--	1.84 J1	0.02781	< 0.005 U1	24.56	10.11	< 0.86 U1
12/27/2021	Background	--	--	--	--	--	--	--	--	0.38	--	0.0233	--	--	--	--
11/8/2022	Background	0.35	1.21	57.6	0.12 J1	0.088	1.43	2.15	--	0.34	0.83	0.0276	--	8.9	8.69	0.05 J1
12/12/2022	Background	0.21	1.37	114	0.118	0.143	1.92	1.91	--	--	1.44	0.0242	< 0.002 U1	11.6	6.11	0.05 J1
3/8/2023	Background	0.47	2.63	131	0.244	0.286	4.05	2.59	--	--	3.51	0.0220	0.002 J1	15.5	10.5	0.05 J1
6/20/2023	Background	0.234	0.81	47.9	0.095	0.115	1.18	1.18	--	0.45	0.93	0.0208	< 0.002 U1	15.4	4.84	0.03 J1
4/16/2024	Background	0.202	1.73	73.0	0.143	0.161	2.23	3.11	--	0.47	2.26	0.0173	< 0.002 U1	16.0	3.59	0.05 J1
10/22/2024	Background	--	--	--	--	--	--	--	3.12	0.40	--	--	< 0.002 U1	--	--	--

Table 1. Groundwater Data Summary: MW-14
Northeastern - LF
Appendix A 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
5/30/2018	Background	1.47	77.1	--	--	6.7	--	--
6/27/2018	Background	1.56	71	--	--	--	--	--
7/31/2018	Background	1.50	68.0	--	--	7.4	--	--
8/30/2018	Background	2.09	181	--	--	7.8	--	--
8/26/2019	Background	1.69	110	3,117	3.066	8.6	357	6,198
6/30/2020	Background	1.36	60.8	2,980	3.97	8.5	189	5,370
10/21/2020	Background	1.39	64.3	2,830	4.22	8.6	226	11,900
12/28/2021	Background	1.20	58.2	2,920	4.5	7.2	278	5,890
11/8/2022	Background	1.29	100 M1	2,870	4.9	7.2	214	5,600
12/12/2022	Background	1.23	75.3	--	--	7.3	--	--
1/24/2023	Background	1.16	129	--	--	7.5	--	--
3/8/2023	Background	1.31	50.5	2,710	4.7	8.1	255	5,390
4/10/2023	Background	1.55	106	--	--	7.4	--	--
10/10/2023	Background	1.42	122	2,880	4.2	7.4	346	5,840
4/16/2024	Background	0.7 J1	71.0	920	2.7	7.3	136	1,900
10/22/2024	Background	0.267	102	890	1.9	7.7	90	2,400

Table 1. Groundwater Data Summary: MW-14
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/30/2018	Background	0.93 J1	1.15 J1	157	< 0.02 U1	< 0.07 U1	< 0.23 U1	3.29 J1	--	--	< 0.68 U1	0.361	0.009 J1	20.67	5.51	< 0.86 U1
6/27/2018	Background	< 0.93 U1	< 1.05 U1	161	< 0.02 U1	< 0.07 U1	< 0.23 U1	3.14 J1	--	--	< 0.68 U1	0.378	0.006 J1	20.16	4.35 J1	42
7/31/2018	Background	1.35	0.58	172	0.029	0.18	< 7 U1	2.63	--	--	0.037	0.362	0.008 J1	27.8	3.5	0.05 J1
8/30/2018	Background	1.61	0.57	153	0.034	0.21	0.286	1.71	--	--	1.06	0.38	< 0.005 U1	31.7	2.2	0.03 J1
12/28/2021	Background	--	--	--	--	--	--	--	--	4.5	--	0.268	--	--	--	--
11/8/2022	Background	0.81	0.95	353 M1	0.053	0.165	4.61	2.08	--	4.9	1.12	0.322	--	12.9	0.72	< 0.04 U1
12/12/2022	Background	0.84	1.14	283	0.029 J1	0.163	1.80	3.28	--	--	0.58	0.265	0.002 J1	14.1	1.34	< 0.04 U1
1/24/2023	Background	1.2	2.9	644	0.34 J1	6.49	29.9	5.64	--	--	6.6	0.297	0.008 J1	13	2.0 J1	< 0.4 U1
3/8/2023	Background	1.1	2.9	854	0.22 J1	0.22	33.3	2.17	--	4.7	5.1	0.335	0.003 J1	14	2.0 J1	< 0.4 U1
4/10/2023	Background	2.26	2.2	861	0.19 J1	0.19 J1	25.0	2.01	--	--	6.6	0.312	0.006	30	4.0 J1	< 0.2 U1
4/16/2024	Background	0.5 J1	< 0.6 U1	152	< 0.1 U1	0.13 J1	< 1 U1	0.2 J1	--	2.7	< 1 U1	0.138	0.004 J1	9 J1	3.8 J1	< 0.2 U1
10/22/2024	Background	--	--	--	--	--	--	--	0.58	1.9	--	--	--	--	--	--

Table 1. Groundwater Data Summary: MW-15
Northeastern - LF
Appendix A 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
1/25/2017	Background	9.45	87	19	2	8.0	530	1,112
3/13/2017	Background	8.23	104	28	2	--	551	1,110
4/25/2017	Background	9.44	73.1	78	1.83	7.6	558	1,128
5/18/2017	Background	10.2	52.2	111	2	--	596	1,092
6/15/2017	Background	9.74	126	24	1.96	7.9	559	1,060
6/27/2017	Background	9.75	79.2	22	1.8739	8.5	616	1,072
7/12/2017	Background	9.87	110	19	1.894	8.2	632	1,076
8/4/2017	Background	9.66	86.3	19	1.759	7.6	612	1,032
8/17/2017	Background	9.53	93.1	18	1.691	7.8	572	1,110
8/30/2017	Background	9.59	64.9	17	2.0289	6.7	590	1,038
9/13/2017	Background	9.13	68	17	1.671	8.6	584	1,080
9/20/2017	Background	9.65	67.6	15	0.642 J1	7.5	543	1,036
10/11/2017	Detection	9.62	80.1	46	1.9468	7.6	593	1,124
1/22/2018	Detection	9.16	--	--	--	7.2	--	--
5/30/2018	Detection	8.76	105	33	2.331	7.7	549	1,128
10/15/2018	Detection	--	--	--	2.27	--	--	--
10/22/2018	Detection	8.90	250	46.81	2.17	7.8	549.46	1,082
11/28/2018	Detection	--	119	--	--	8.3	--	--
2/27/2019	Detection	8.34	96.9	24.3	1.45	8.6	574	1,046
8/26/2019	Detection	8.28	119	20	1.252	10.5	587	1,072
12/3/2019	Detection	--	--	--	--	7.7	--	--
6/30/2020	Detection	8.00	105	17.9	1.55	9.3	706	1,100
10/21/2020	Detection	7.79	117	15.7	1.53	11.0	631	1,140
12/16/2020	Detection	--	--	--	--	7.8	--	--
4/13/2021	Detection	8.40	93.5	15.5	1.71	8.8	659	1,100
6/22/2021	Detection	--	--	--	--	7.8	662	--
12/28/2021	Detection	7.28	123	15.9	1.49	7.5	631	1,090
6/14/2022	Detection	8.71	85.5	15.3	1.71	8.7	643	1,080 L1, S7
11/7/2022	Detection	7.08	122	17.0	1.32	7.9	628	1,090
6/20/2023	Detection	6.96	129	16.3	1.42	8.0	635	1,080
10/10/2023	Detection	6.61	122	15.7	1.28	8.0	619	1,080
4/16/2024	Detection	6.73	113 M1	16.6	1.26	7.9	612	1,100
8/26/2024	Detection	6.69	--	--	--	7.7	638	--
10/22/2024	Detection	6.19	124	15.7	1.28	8.2	608	1,080

Table 1. Groundwater Data Summary: MW-15
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
1/25/2017	Background	< 5 U1	< 5 U1	107	< 1 U1	< 1 U1	3	< 5 U1	0.505	2	< 5 U1	0.012	< 0.025 U1	643	< 5 U1	< 2 U1
3/13/2017	Background	< 5 U1	< 5 U1	100	< 1 U1	< 1 U1	3	< 5 U1	1.241	2	< 5 U1	0.01	< 0.025 U1	550	< 5 U1	< 2 U1
4/25/2017	Background	1.31 J1	2.85 J1	55.73	< 0.02 U1	< 0.07 U1	0.23 J1	0.64 J1	0.203	1.83	< 0.68 U1	0.00786	< 0.005 U1	614	1.83 J1	1.05 J1
5/18/2017	Background	1.38 J1	13.61	52.06	< 0.02 U1	0.26 J1	0.96 J1	0.62 J1	1.097	2	1.7 J1	0.00834	0.022 J1	605	22.28	< 0.86 U1
6/15/2017	Background	< 0.93 U1	7.56	212	0.25 J1	0.64 J1	8.57	3.96 J1	1.215	1.96	5.25	0.01148	0.02 J1	662	12.46	< 0.86 U1
6/27/2017	Background	< 0.93 U1	4.4 J1	98.67	0.02 J1	< 0.07 U1	1.79	1.29 J1	1.652	1.8739	2.42 J1	0.00722	0.022 J1	644	5.76	< 0.86 U1
7/12/2017	Background	1.63 J1	3.77 J1	150	0.12 J1	0.09 J1	4.03	2.64 J1	0.287	1.894	2.87 J1	0.0091	0.009 J1	668	9	< 0.86 U1
8/4/2017	Background	1.56 J1	3.73 J1	94.19	0.08 J1	0.09 J1	1.51	1.4 J1	0.914	1.759	1.36 J1	0.00752	0.021 J1	647	6	< 0.86 U1
8/17/2017	Background	0.99 J1	4.44 J1	133	0.09 J1	< 0.07 U1	3.3	1.69 J1	0.649	1.691	1.44 J1	0.00823	0.015 J1	642	5.95	< 0.86 U1
8/30/2017	Background	< 0.93 U1	6.32	64.87	0.04 J1	< 0.07 U1	0.86 J1	0.78 J1	0.393	2.0289	< 0.68 U1	0.00629	0.01 J1	656	9.24	< 0.86 U1
9/13/2017	Background	< 0.93 U1	4.18 J1	54.34	0.03 J1	< 0.07 U1	< 0.23 U1	0.66 J1	1.07	1.671	< 0.68 U1	0.00635	0.008 J1	638	1.45 J1	< 0.86 U1
9/20/2017	Background	< 0.93 U1	3.87 J1	49.23	< 0.02 U1	< 0.07 U1	0.23 J1	0.77 J1	0.887	0.642 J1	< 0.68 U1	0.00621	< 0.005 U1	652	3.77 J1	< 0.86 U1

Table 1. Groundwater Data Summary: MW-16
Northeastern - LF
Appendix A 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
5/18/2017	Background	4.77	338	62	< 0.083 U1	--	499	1,314
6/15/2017	Background	4.1	154	56	0.879 J1	8.5	467	1,328
8/17/2017	Background	6.48	201	36	0.84 J1	7.2	745	1,856

Table 1. Groundwater Data Summary: MW-16
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
5/18/2017	Background	< 0.93 U1	6.8	494	1.01	2.94	36.5	15.32	0.969	< 0.083 U1	16.64	0.05597	0.032	198	10.98	< 0.86 U1
6/15/2017	Background	< 0.93 U1	< 1.05 U1	83.73	0.07 J1	< 0.07 U1	2.51	2.43 J1	1.258	0.879 J1	1.44 J1	0.02944	0.007 J1	212	3.86 J1	< 0.86 U1
8/17/2017	Background	< 0.93 U1	< 1.05 U1	139	0.16 J1	0.41 J1	7.64	5.26	0.653	0.84 J1	3.4 J1	0.04163	0.012 J1	204	14.41	< 0.86 U1

Table 1. Groundwater Data Summary: MW-17
Northeastern - LF
Appendix A 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
6/27/2017	Background	1.13	894	38	0.9268 J1	7.5	820	1,592
8/17/2017	Background	1.2	789	28	0.699 J1	7.4	1,078	2,046
5/30/2018	Assessment	0.702	191	--	--	8.0	--	--
6/27/2018	Assessment	0.715	205	--	--	--	--	--
7/31/2018	Assessment	0.843	234	--	--	8.6	--	--
9/19/2018	Assessment	0.767	330	--	--	7.9	--	--
11/7/2022	Detection	1	231	11.3	0.89	7.0	440	1,010
2/21/2023	Detection	1.2	469	11.7	0.68	7.3	764	1,500 S7

Table 1. Groundwater Data Summary: MW-17
Northeastern - LF
Appendix B 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	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L
6/27/2017	Background	< 0.93 U1	20.5	975	2.77	6.77	74.59	47.64	--	0.9268 J1	76.11	0.06776	0.144	30.24	19.31	< 0.86 U1
8/17/2017	Background	< 0.93 U1	18.23	763	2.66	3.88	91.46	47.25	--	0.699 J1	56.22	0.07669	0.097	29.04	17.5	< 0.86 U1
5/30/2018	Assessment	1.61 J1	< 1.05 U1	40.12	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.31 J1	--	--	< 0.68 U1	0.01139	< 0.005 U1	8.38	26.7	< 0.86 U1
6/27/2018	Assessment	2.57 J1	< 1.05 U1	41.52	< 0.02 U1	< 0.07 U1	< 0.23 U1	0.75 J1	--	--	< 0.68 U1	0.01282	< 0.005 U1	7.94	12.46	1.63 J1
7/31/2018	Assessment	0.28	0.28	39.5	0.005 J1	0.10	< 0.007 U1	1.84	--	--	0.056	0.017	< 0.005 U1	8.66	5.4	0.057
9/19/2018	Assessment	0.20	0.27	36.7	< 0.02 U1	0.07	< 0.04 U1	2.98	--	--	0.06 J1	0.0121	< 0.005 U1	9.62	4.4	< 0.1 U1

Notes:
1. Combined radium values were calculated from the sum of the reported radium-226 and radium-228 results.
Radium data quality flags were not included. Reported negative radium-226 or radium-228 results were replaced with zero.
--: Not analyzed
<: Non-detect value. Analytes which were not detected are shown as less than the method detection limit (MDL) followed by a 'U1' flag.
In analytical data prior to 5/18/2021, U1 flags were reported as U in the analytical report.
H2: Sample analysis performed past holding time.
J1: Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
In analytical data prior to 5/18/2021, J1 flags were reported as J in the analytical report.
L1: The associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits.
M1: The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
mg/L: milligrams per liter
pCi/L: picocuries per liter
Q1: Sample received in inappropriate sample container.
Q5: Sample was received with improper chemical preservation.
S7: Sample did not achieve constant weight.
SU: standard unit
µg/L: micrograms per liter

APPENDIX 2

Where applicable, shown in this appendix are the results from statistical analyses, and a description of the statistical analysis method chosen.

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Memorandum

Date:	February 13, 2024
To:	David Miller (AEP)
Copies to:	Rebecca Jones (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Northeastern Plant's Landfill (LF)

The second semiannual detection monitoring event of 2023 at the Landfill (LF), an existing CCR unit at the Northeastern Power Plant located in Oologah, Oklahoma, was completed on October 10, 2023 in accordance with Oklahoma Department of Environmental Quality rules regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (OAC 252.517). Based on these results, verification sampling was completed on December 28, 2023.

Background values for the LF were previously calculated for wells MW-3D, MW-6D, MW-9D, MW-12D, and MW-15 in January 2018. Background values for wells MW-4D, MW-5D, and MW-12D were previously calculated in July 2019. After a minimum of four detection monitoring events, the results of those events were compared to the existing background dataset, and the background dataset was updated as appropriate. Revised upper prediction limits (UPLs) were calculated for each Appendix A parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the calculation of the most recent revision to background values are described in Geosyntec's *Statistical Analysis Summary – Background Update Calculations* report, dated December 28, 2021.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is only concluded if both samples in a series of two exceeds the UPL. In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1. No SSIs were observed at the Northeastern LF CCR unit, and as a result the Northeastern LF will remain in detection monitoring.

The statistical analysis was conducted within 90 days of completion of sampling and analysis in accordance with OAC 252:517-9-4(h)(6). A certification of these statistics by a qualified professional engineer is provided in Attachment A.

Table 1. Detection Monitoring Data Comparison
Detection Summary Memorandum
Northeastern Plant - Landfill

Analyte	Unit	Description	MW-3D	MW-4D	MW-5D	MW-6D	MW-9D		MW-12D	MW-15
			10/10/2023	10/10/2023	10/10/2023	10/10/2023	10/10/2023	12/28/2023	10/10/2023	10/10/2023
Boron	mg/L	Intrawell Background Value (UPL)	1.06	1.59	0.621	4.52	7.94		10.2	10.6
		Analytical Result	0.809	0.789	0.419	2.56	5.87	--	6.33	6.61
Calcium	mg/L	Intrawell Background Value (UPL)	175	214	166	272	295		172	137
		Analytical Result	113	166	121	168	186	--	59.1	122
Chloride	mg/L	Intrawell Background Value (UPL)	15.5	41.0	32.6	34.1	147		23.3	111
		Analytical Result	12.8	32.5	25.2	27	25.5	--	12.5	15.7
Fluoride	mg/L	Intrawell Background Value (UPL)	1.02	0.500	1.05	1.18	2.03		3.16	2.59
		Analytical Result	0.78	0.24	0.57	0.82	0.80	--	1.74	1.28
pH	SU	Intrawell Background Value (UPL)	8.2	8.7	9.5	8.1	7.7		9.8	9.3
		Intrawell Background Value (LPL)	6.3	6.7	6.6	6.3	6.8		7.2	6.7
		Analytical Result	7.6	7.1	7.4	7.6	**8.3**	7.4	8.1	8.0
Sulfate	mg/L	Intrawell Background Value (UPL)	243	485	178	581	1,010		683	690
		Analytical Result	174	282	140	454	783	--	489	619
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	815	1,050	682	1,170	1,550		1,150	1,160
		Analytical Result	630	810	580	1,030	**1,570**	1,210	850	1,080

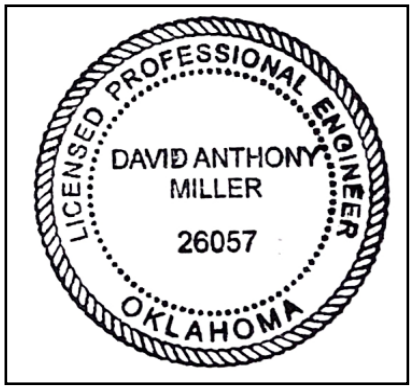
Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

ATTACHMENT A

Certification by a Qualified Professional Engineer

CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected statistical method, described above and in the December 28, 2021 *Statistical Analysis Summary – Background Update Calculations* report, is appropriate for evaluating the groundwater monitoring data for the Northeastern LF CCR management area and that the requirements of OAC 252:517-9-4(g) have been met.



David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

26057	Oklahoma	02.20.2024
License Number	Licensing State	Date

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Memorandum

Date:	December 10, 2024
To:	David Miller (AEP)
Copies to:	Pryce Warren (AEP)
From:	Allison Kreinberg (Geosyntec)
Subject:	Evaluation of Detection Monitoring Data at Northeastern Plant's Landfill

The first semiannual detection monitoring event of 2024 at the Landfill, an existing CCR unit at the Northeastern Power Plant located in Oologah, Oklahoma, was completed on April 16, 2024 in accordance with Oklahoma Department of Environmental Quality (ODEQ) rules regarding the disposal of coal combustion residuals (CCR) in landfills and surface impoundments (OAC 252.517). Based on these results, verification sampling was completed on August 26, 2024.

Background values for the Landfill were previously calculated for wells MW-3D, MW-6D, MW-9D, MW-12D, and MW-15 in January 2018. Background values for wells MW-4D, MW-5D, and MW-12D were previously calculated in July 2019. After a minimum of four detection monitoring events, the results of those additional events were compared to the existing background dataset, and the background dataset was updated as appropriate. In December 2024, the background dataset was also updated to reflect the inclusion of background wells SP-4 and SP-5R in the Landfill groundwater monitoring network at the request of ODEQ.[1] Upper prediction limits (UPLs) were calculated for each Appendix A parameter to represent background values. A lower prediction limits (LPL) was also calculated for pH. Details on the calculation of the most recent revision to background values are described in Geosyntec's *Statistical Analysis Summary – Background Update Calculations* report, dated December 10, 2024.

To achieve an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less, prediction limits were calculated based on a one-of-two retesting procedure. With this procedure, a statistically significant increase (SSI) is only concluded if both

[1] ODEQ. 2024. *Response to Background Wells – 2023 Annual Groundwater Monitoring Report. Public Service Company of Oklahoma – Northeastern Power Station Landfill*. Oklahoma Department of Environmental Quality. October.

samples in a series of two exceeds the UPL. In practice, if the initial result did not exceed the UPL, a second sample was not collected or analyzed.

Detection monitoring results and the relevant background values are compared in Table 1 and noted exceedances are described in the list below.

- Boron concentrations exceeded the interwell UPL of 0.528 mg/L in both the initial (0.872 milligram per liter [mg/L]) and second (0.835 mg/L) samples collected at MW-3D, the initial (1.01 mg/L) and second (0.642 mg/L) samples collected at MW-4D, the initial (2.57 mg/L) and second (2.70 mg/L) samples collected at MW-6D, the initial (5.67 mg/L) and second (5.65 mg/L) samples collected at MW-9D, the initial (6.64 mg/L) and second (6.40 mg/L) samples collected at MW-12D, and the initial (6.73 mg/L) and second (6.69 mg/L) samples collected at MW-15. Therefore, SSIs over background are concluded for boron at MW-3D, MW-4D, MW-6D, MW-9D, MW-12D, and MW-15.

- Sulfate concentrations exceeded the interwell UPL of 83.0 mg/L in both the initial (168 mg/L) and second (167 mg/L) samples collected at MW-3D, the initial (348 mg/L) and second (270 mg/L) samples collected at MW-4D, the initial (129 mg/L) and second (129 mg/L) samples collected at MW-5D, the initial (873 mg/L) and second (468 mg/L) samples collected at MW-6D, the initial (625 mg/L) and second (529 mg/L) samples collected at MW-9D, the initial (502 mg/L) and second (512 mg/L) samples collected at MW-12D, and the initial (612 mg/L) and second (638 mg/L) samples collected at MW-15. Therefore, SSIs over background are concluded for sulfate at MW-3D, MW-4D, MW-5D, MW-6D, MW-9D, MW-12D, and MW-15.

In response to the exceedances noted above, the Northeastern Landfill CCR unit will either transition to asssessment monitoring or an alternative source demonstration (ASD) for boron and sulfate will be conducted in accordance with OAC 252:517-9-5(e)(2). If the ASD is successful, the Northeastern Landfill will remain in detection monitoring.

The statistical analysis was conducted within 90 days of completion of sampling and analysis in accordance with OAC 252:517-9-4(h)(6). A certification of these statistics by a qualified professional engineer is provided in Attachment A.

Table 1. Detection Monitoring Data Evaluation
Detection Summary Memorandum
Northeastern Plant – Landfill

Analyte	Unit	Description	MW-3D		MW-4D		MW-5D		MW-6D	
			4/16/2024	8/26/2024	4/16/2024	8/26/2024	4/16/2024	8/26/2024	4/16/2024	8/26/2024
Boron	mg/L	Interwell Background Value (UPL)	0.528							
		Analytical Result	**0.872**	**0.835**	**1.01**	**0.642**	0.400	--	**2.57**	**2.70**
Calcium	mg/L	Intrawell Background Value (UPL)	172		213		164		263	
		Analytical Result	116	--	179	--	115	--	201	--
Chloride	mg/L	Intrawell Background Value (UPL)	15.0		42.4		30.3		33.6	
		Analytical Result	12.7	--	28.4	--	25.9	--	27.1	--
Fluoride	mg/L	Interwell Background Value (UPL)	4.39							
		Analytical Result	0.79	--	0.25	--	0.58	--	0.83	--
pH	SU	Interwell Background Value (UPL)	9.1							
		Interwell Background Value (LPL)	7.0							
		Analytical Result	8.0	--	7.2	--	7.4	--	7.5	--
Sulfate	mg/L	Interwell Background Value (UPL)	83.0							
		Analytical Result	**168**	**167**	**348**	**270**	**129**	**129**	**873**	**468**
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	809		1021		686		1156	
		Analytical Result	610	--	940	--	580	--	1,060	--

Analyte	Unit	Description	MW-9D		MW-12D		MW-15	
			4/16/2024	8/26/2024	4/16/2024	8/26/2024	4/16/2024	8/26/2024
Boron	mg/L	Interwell Background Value (UPL)	0.528					
		Analytical Result	**5.67**	**5.65**	**6.64**	**6.40**	**6.73**	**6.69**
Calcium	mg/L	Intrawell Background Value (UPL)	273		164		146	
		Analytical Result	**299**	141	67.7	--	113	--
Chloride	mg/L	Intrawell Background Value (UPL)	106		22.9		46.8	
		Analytical Result	25.0	--	13.2	--	16.6	--
Fluoride	mg/L	Interwell Background Value (UPL)	4.39					
		Analytical Result	0.88	--	1.63	--	1.26	--
pH	SU	Interwell Background Value (UPL)	9.1					
		Interwell Background Value (LPL)	7.0					
		Analytical Result	7.9	--	8.4	--	7.9	--
Sulfate	mg/L	Interwell Background Value (UPL)	83.0					
		Analytical Result	**625**	**529**	**502**	**512**	**612**	**638**
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	1706		1184		1151	
		Analytical Result	1,330	--	930	--	1,100	--

Notes:
1. Bold values exceed the background value.
2. Background values are shaded gray.
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

ATTACHMENT A

Certification by a Qualified Professional Engineer

CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER

I certify that the selected statistical method, described above and in the December 10, 2024 *Statistical Analysis Summary – Background Update Calculations* report, is appropriate for evaluating the groundwater monitoring data for the Northeastern Landfill CCR management area and that the requirements of OAC 252:517-9-4(g) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

26057	Oklahoma	12.11.2024
License Number	Licensing State	Date

Geosyntec consultants

engineers | scientists | innovators

STATISTICAL ANALYSIS SUMMARY, BACKGROUND UPDATE CALCULATIONS

Stations 3 and 4 Landfill

Northeastern Plant

Oologah, Oklahoma

Prepared for

American Electric Power
1 Riverside Plaza
Columbus, Ohio 43215-2372

Prepared by

Geosyntec Consultants, Inc.
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Worthington, Ohio 43085

Project Number: CHA8500B

December 9, 2024

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ACRONYMS AND ABBREVIATIONS

ANOVA	analysis of variance
CCR	coal combustion residuals
LPL	lower prediction limit
PQL	practical quantitation limit
OAC	Oklahoma Administrative Code
ODEQ	Oklahoma Department of Environmental Quality
QA/QC	quality assurance and quality control
TDS	total dissolved solids
UPL	upper prediction limit
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

Groundwater monitoring has been conducted at the Stations 3 and 4 Landfill (Landfill), an existing coal combustions residuals (CCR) unit at the Northeastern Power Plant in Oologah, Oklahoma, in accordance with the Oklahoma Department of Environmental Quality (ODEQ) and Oklahoma Administrative Code (OAC) regulations regarding the disposal of CCR in landfills and surface impoundments (OAC 252.517, "CCR rule"). It is required under the CCR rule to establish background concentrations for Appendix A parameters in groundwater. These background concentrations are used to calculate prediction limits for future detection monitoring events.

Background concentration values for Appendix A parameters were last calculated for the Landfill in December 2021. Since then, five semiannual detection monitoring events were conducted and the network was revised to incorporate two background locations. This report details how data from these recent groundwater monitoring results and additional locations were analyzed and incorporated into the Landfill background dataset and provides updated prediction limits.

1.1 Previous Monitoring Events and Background Calculations

Before October 2017, at least eight monitoring events were completed to establish background concentrations and calculate prediction limits for Appendix A and Appendix B parameters under the CCR rule. The data were reviewed for outliers and trends before upper prediction limits (UPLs) were calculated for each Appendix A parameter and lower prediction limits (LPLs) were established for pH. The statistical analyses completed to establish background levels are detailed in the January 2018 *Statistical Analysis Summary* report (Geosyntec 2018a).

Following submittal of an alternative source demonstration in April 2018 (Geosyntec 2018b), ODEQ required intrawell statistics with a one-of-two resampling plan to be used until an appropriate background location can be identified and for additional wells to be added to the downgradient monitoring network. In July 2019, the groundwater monitoring network was expanded to include additional deep wells surrounding the unit. In October 2024, ODEQ approved the use of wells SP-4 and SP-5R, located upgradient of the Bottom Ash Pond, as background locations for the Landfill (ODEQ 2024).

Calculated background values should be updated every four to eight measurements, as recommended in the United States Environmental Protection Agency (USEPA) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance* (USEPA 2009). These updated background concentration values are used to revise the site-specific prediction limits.

In December 2021, prediction limits for Appendix A parameters were updated with data collected through July 2021 (Geosyntec 2021a). Intrawell testing (using a one-of-two retesting procedure) was selected as the method of analysis and these prediction limits were used for detection monitoring events completed between December 2021 and October 2023.

2. STATISTICAL ANALYSIS AND BACKGROUND DATA UPDATE

Five semiannual detection monitoring events were conducted at compliance locations in the Landfill groundwater monitoring network since the last background update (Table 1). Verification sampling was completed (on an individual well or parameter basis) if the initial results for each detection monitoring event identified possible exceedances. Therefore, a minimum of five samples have been collected from each compliance well since the previous background update.

Monitoring wells MW-1D, MW-2D, MW-10D, MW-11D, MW-13D, MW-14, MW-16, and MW-17 were historically dry or did not have a minimum of eight samples to establish background limits. The background for these wells will be updated when sufficient data becomes available.

Data from the five semiannual detection monitoring events conducted at the Landfill between December 2021 and October 2023, including both initial and verification results, have been evaluated for inclusion in the background dataset. Additionally, all available data for background wells SP-4 and SP-5R, which were added to the Landfill groundwater monitoring network in 2024 at the request of ODEQ (ODEQ 2024) were included in the evaluation. Previously collected SP-4 and SP-5R data is summarized in the January 2024 *Annual Groundwater Monitoring Report* (AEP 2024)

The detection monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. The data were reviewed for outliers, and no outliers were identified for these events. The selected statistical methods have been certified by a qualified professional engineer (Attachment A).

2.1 Data Validation and QA/QC

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

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location identification 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.10.0.23a statistics software. The export file was checked against the analytical data for transcription errors and completeness. No QA/QC issues that would impact data usability were noted.

2.2 Statistical Analysis

Statistical analyses for the Landfill were conducted in accordance with the *Statistical Analysis Plan* (Geosyntec 2021b). These statistical analyses incorporated data from the five semiannual detection monitoring events and associated verification sampling events conducted between December 2021 and October 2023 (Table 1). The statistical analyses also incorporated the available data from background wells SP-4 and SP-5R. The complete statistical analysis results are included in Attachment B.

Time series plots of Appendix A parameters (Attachment B) were used to evaluate concentrations over time and to provide an initial screening of suspected outliers and trends. Box plots were also compiled to provide visual representation of variations between wells and within individual wells (Attachment B).

2.2.1 Outlier Evaluation

Potential outliers were evaluated using Tukey's outlier test. That is, data points were considered potential outliers if they met one of the following criteria:

$$x_i < \tilde{x}_{0.25} - 3 \times IQR \quad (1)$$

or

$$x_i > \tilde{x}_{0.75} + 3 \times IQR \quad (2)$$

where:

$x_i =$ individual data point
$\tilde{x}_{0.25} =$ first quartile
$\tilde{x}_{0.75} =$ third quartile
$IQR =$ the interquartile range $= \tilde{x}_{0.75} - \tilde{x}_{0.25}$

Data that were evaluated as potential outliers are summarized in Attachment B. No outliers were identified for these events.

2.2.2 Establishment of Updated Background Dataset

Following installation, some monitoring wells were sampled monthly to establish background values. Rank Von Neumann serial correlation tests were used to evaluate if the samples collected after the installation periods represented independent or correlated values.

Significant serial correlation was found for the following well/constituent pairs:

- Calcium at background well SP-4.
- Chloride at compliance wells MW-3D and MW-15.
- pH at compliance well MW-3D.
- Sulfate at background wells SP-4 and SP-5R.

Background datasets for these well/constituent pairs were truncated to construct statistical limits representative of present-day conditions.

Analysis of variance (ANOVA) was conducted to assist in evaluating whether interwell or intrawell testing is the most appropriate statistical approach for assessing Appendix A parameters. Intrawell tests, which compare compliance data from a single well to background data within the same well, are most appropriate 1) when background wells exhibit spatial variation; 2) when statistical limits constructed from background wells would not be conservative from a regulatory perspective; or 3) when water quality at compliance locations is not impacted compared to background water quality for the same parameter. It is necessary to update background statistical limits (calculated prediction limits) periodically because natural systems change continuously with

physical changes to the environment. For intrawell analyses, data for all wells and constituents are reevaluated when a minimum of four new data points are available. These four (or more) new data points are used to determine whether earlier concentrations are representative of present-day groundwater quality.

ANOVA indicated no significant variation between SP-4 and SP-5R for fluoride and pH. Statistically significant variation was observed among background wells SP-4 and SP-5R for boron, calcium, chloride, sulfate, and total dissolved solids (TDS). Therefore, the appropriateness of using intrawell tests was evaluated for these parameters at the Northeastern Landfill.

Intrawell tests presume that the groundwater quality in the compliance wells was not initially impacted by the CCR unit. To test this presumption, the data from the background wells were pooled, and the data from each compliance well were compared to a pooled background value. Tolerance limits were calculated using the pooled background data for boron, calcium, chloride, sulfate, and TDS. Parametric tolerance limits with 99% confidence and 95% coverage were calculated for boron and calcium; non-parametric tolerance limits were calculated for chloride, fluoride, sulfate, and TDS, given the non-normal distribution of data observed for these four parameters.

Confidence intervals were calculated for boron, calcium, chloride, sulfate, and TDS at each compliance monitoring well. When the entire confidence interval is above a background tolerance limit for at least one compliance well for a given constituent, interwell methods are initially recommended. Confidence intervals exceeded their respective tolerance limits for at least one compliance well for boron and sulfate. Therefore, interwell tests were selected for boron and sulfate and it was determined that intrawell tests were appropriate for calcium, chloride, and TDS.

Mann Kendall trend tests were used to identify statistically significant increasing or decreasing trends at the 99% confidence level within the background datasets. Trend tests were used to evaluate trends among background wells for constituents being evaluated for interwell prediction limits (i.e., boron, fluoride, pH, and sulfate), and among all wells for constituents being evaluated with intrawell prediction limits (calcium, chloride, and TDS).

Significant trends were identified for the following well/constituent pairs:

- Calcium at compliance well MW-15.
- Chloride at background well SP-5R.
- Sulfate at background well SP-4.
- TDS at background well SP-5R.

Significant decreasing trends were identified for the following well/constituent pairs:

- Boron at background wells SP-4 and SP-5R.
- Calcium at compliance well MW-12D.
- Chloride at compliance well MW-12D and MW-15.
- TDS at compliance well MW-12D.

No datasets were truncated based on the results of the trend test, as the well-constituent pairs with significant results either had concentrations similar to those at the background monitoring locations or variable concentrations within the same range at the same well. Several of these datasets were truncated based on the Rank Von Neumann serial correlation test results.

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

2.2.3 Updated Prediction Limits

Historical data through October 2023, except as noted above, were used to calculate the intrawell UPLs for calcium, chloride, and TDS and interwell UPLs for boron, fluoride, pH, and sulfate (and an interwell LPL, for pH) and to represent background values (Table 2).

The intrawell UPLs were calculated for a one-of-two retesting procedure; that is, if at least one sample in a series of two has no measurement greater than the UPL and if the pH result is greater than or equal to the LPL, then it can be concluded that a statistically significant increase has not occurred. In practice, where the initial result is not greater than the UPL and where the pH result is greater than or equal to the LPL, a second sample will not be collected. The retesting procedures allow an acceptably high statistical power to detect changes at compliance wells for constituents evaluated with intrawell prediction limits.

2.3 Conclusions

Five detection monitoring events were completed between December 2021 and October 2023 in accordance with the CCR rule. Data from these events were included in the new dataset. The laboratory and field data from these events were reviewed prior to statistical analysis, and no QA/QC issues that impacted data usability were identified. Where appropriate, the background datasets were updated, and UPLs and LPLs were recalculated taking into consideration that background monitoring wells SP-4 and SP-5R were added to the Landfill groundwater monitoring network. Using a one-of-two retesting procedure, intrawell tests were selected for calcium, chloride, and TDS, and interwell tests were selected for boron, fluoride, pH, and sulfate. Testing data were updated for all Appendix A parameters.

3. REFERENCES

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TABLES

Table 1. Groundwater Data Summary
Statistical Analysis Summary – Background Update Calculations
Northeastern Plant – Landfill

Geosyntec Consultants, Inc.

Parameter	Unit	MW-3D				
		12/28/2021	6/14/2022	11/7/2022	6/20/2023	10/10/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2023-D2
Boron	mg/L	0.829	0.882	0.864	0.890	0.809
Calcium	mg/L	114 M1	124	121	103	113
Chloride	mg/L	12.3	12.5	12.9	13.3	12.8
Fluoride	mg/L	0.82	0.84	0.81	0.83	0.78
Sulfate	mg/L	175	177	181	176	174
Total Dissolved Solids	mg/L	620	630 L1	650	630	630
pH	SU	7.1	7.2	7.2	7.2	7.6

Parameter	Unit	MW-4D				
		12/28/2021	6/14/2022	11/7/2022	6/20/2023	10/10/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2023-D2
Boron	mg/L	0.881	0.865	0.762	0.723	0.789
Calcium	mg/L	167	161	181	154	166
Chloride	mg/L	29.4	36.3	36.9	30.0	32.5
Fluoride	mg/L	0.26	0.32	0.26	0.26	0.24
Sulfate	mg/L	281	283	258	290	282
Total Dissolved Solids	mg/L	810	850 L1	810	790	810
pH	SU	6.9	7.1	7.2	7.2	7.1

Parameter	Unit	MW-5D				
		12/28/2021	6/14/2022	11/7/2022	6/20/2023	10/10/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2023-D2
Boron	mg/L	0.458	0.479	0.445	0.444	0.419
Calcium	mg/L	123	131	123	113	121
Chloride	mg/L	26.9	26.5	26.3	25.9	25.2
Fluoride	mg/L	0.60	0.61	0.58	0.58	0.57
Sulfate	mg/L	157	150	148	140	140
Total Dissolved Solids	mg/L	590	620 L1	610	620	580
pH	SU	7.1	7.4	7.1	7.3	7.4

Table 1. Groundwater Data Summary *Geosyntec Consultants, Inc.*
Statistical Analysis Summary – Background Update Calculations
Northeastern Plant – Landfill

Parameter	Unit	MW-6D				
		12/28/2021	6/14/2022	11/7/2022	6/20/2023	10/10/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2023-D2
Boron	mg/L	2.98	3.04	3.00	2.75	2.56
Calcium	mg/L	163	203	171	161	168
Chloride	mg/L	27.0	28.7	30.2	28.5	27
Fluoride	mg/L	0.93	1.01	0.92	0.88	0.82
Sulfate	mg/L	469	451	455	466	454
Total Dissolved Solids	mg/L	1,040	1,090 L1	1,050	1,070	1,030
pH	SU	7.1	7.3	7.1	7.1	7.6

Parameter	Unit	MW-9D					
		6/14/2022	8/15/2022	11/7/2022	6/20/2023	10/10/2023	12/28/2023
		2022-D1	2022-D1-R1	2022-D2	2023-D1	2023-D2	2023-D2-R1
Boron	mg/L	6.19	--	6.11	6.12 M1	5.87	--
Calcium	mg/L	196	--	160	204 M1	186	--
Chloride	mg/L	25.9	--	26.2	--	25.5	--
Fluoride	mg/L	0.93	--	0.92	--	0.8	--
Sulfate	mg/L	775	--	624	--	783	--
Total Dissolved Solids	mg/L	1,560 L1	1,250	1,270	--	1,570	1,210
pH	SU	7.3	7.2	8.5	7.2	8.3	7.4

Parameter	Unit	MW-12D				
		12/27/2021	6/14/2022	11/8/2022	6/20/2023	10/10/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2023-D2
Boron	mg/L	6.38	6.89	7.11	6.60	6.33
Calcium	mg/L	80.7	68.3	61.2	63.5	59.1
Chloride	mg/L	12.1	13.4	13.1	13.4	12.5
Fluoride	mg/L	1.90	1.88	1.93	1.80	1.74
Sulfate	mg/L	498	511	507	522	489
Total Dissolved Solids	mg/L	920	940 L1	920	910	850
pH	SU	8.3	8.1	8.5	8.3	8.1

Table 1. Groundwater Data Summary *Geosyntec Consultants, Inc.*
Statistical Analysis Summary – Background Update Calculations
Northeastern Plant – Landfill

Parameter	Unit	MW-15				
		12/28/2021	6/14/2022	11/7/2022	6/20/2023	10/10/2023
		2021-D2	2022-D1	2022-D2	2023-D1	2023-D2
Boron	mg/L	7.28	8.71	7.08	6.96	6.61
Calcium	mg/L	123	85.5	122	129	122
Chloride	mg/L	15.9	15.3	17.0	16.3	15.7
Fluoride	mg/L	1.49	1.71	1.32	1.42	1.28
Sulfate	mg/L	631	643	628	635	619
Total Dissolved Solids	mg/L	1,090	1,080 L1, S7	1,090	1,080	1,080
pH	SU	7.5	8.7	7.9	8.0	8.0

Notes:
--: not measured
D1: first semi-annual detection monitoring event of the year
D2: second semi-annual detection monitoring event of the year
J1: estimated value. Parameter was detected in concentrations below the reporting limit
L1: the associated laboratory control sample (LCS) or laboratory control sample duplicate (LCSD) recovery was outside acceptance limits
M1: the associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits
mg/L: milligrams per liter
R1: first verification event associated with detection monitoring round
S7: Sample did not achieve constant weight.
SU: standard unit
U1: parameter was not present in concentrations above the method detection limit and is reported as the reporting limit

Table 2. Background Level Summary
Statistical Analysis Summary – Background Update Calculations
Northeastern Plant – Landfill

Analyte	Unit	Description	MW-3D	MW-4D	MW-5D	MW-6D	MW-9D	MW-12D	MW-15
Boron	mg/L	Interwell Background Value (UPL)	0.528						
Calcium	mg/L	Intrawell Background Value (UPL)	172	213	164	263	273	164	146
Chloride	mg/L	Intrawell Background Value (UPL)	15.0	42.4	30.3	33.6	106	22.9	46.8
Fluoride	mg/L	Interwell Background Value (UPL)	4.39						
pH	SU	Interwell Background Value (UPL)	9.1						
		Interwell Background Value (LPL)	7.0						
Sulfate	mg/L	Interwell Background Value (UPL)	83.0						
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	809	1021	686	1156	1706	1184	1151

Notes:
LPL: lower prediction limit
mg/L: milligrams per liter
SU: standard units
UPL: upper prediction limit

ATTACHMENT A
Certification by Qualified Professional Engineer

Certification by Qualified Professional Engineer

I certify that selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Northeastern Landfill CCR management area and that the requirements of OAC 252.517-9-4(g) have been met.

David Anthony Miller

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature

26057	Oklahoma	12.10.2024
License Number	Licensing State	Date

ATTACHMENT B
Statistical Analysis Output

GROUNDWATER STATS CONSULTING

December 5, 2024

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

Re: Northeastern Landfill - Background Screening 2024

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the background screening of statistical limits with groundwater data through 2023 at American Electric Power's Northeastern Landfill. The analysis complies with the Oklahoma Administrative Code (OAC 252:517), the federal rule for the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities (CCR Rule, 2015), as well as with the United States Environmental Protection Agency (USEPA) Unified Guidance (2009).

Sampling began at the Northeastern Landfill for the CCR program in 2017. The monitoring well network, as provided by Geosyntec Consultants, consists of the following:

- **Upgradient wells:** SP-4 and SP-5R
- **Downgradient wells**: MW-1D, MW-2D, MW-3D, MW-4D, MW-5D, MW-6D, MW-9D, MW-10, MW-11D, MW-12D, MW-13D, MW-14, MW-15, MW-16, and MW-17

Due to high salinity, upgradient wells were previously not approved as background for this facility. For the current screening, however, upgradient wells from Northeastern BAP, SP-4 and SP-5R listed above, were reportedly approved as background wells for Northeastern LF. Newer wells MW-1D, MW-10D, MW-11D, MW-16, and MW-17 have been historically dry during some of the sample events and do not have a minimum of 8 samples. Therefore, these wells are not included in this report. Downgradient wells

MW-2D and MW-14 were first sampled in 2019, and downgradient well MW-13D was first sampled in 2020; therefore, at those wells, a minimum of 8 samples is not yet available for chloride, fluoride, sulfate, and TDS. While data from these wells are plotted on the time series and box plots, no formal statistics were required at this time.

The original background screening was conducted in October 2018 on all wells in the monitoring well network at that time, and an updated screening is included in this analysis.

Data were sent electronically to Groundwater Stats Consulting, and the 2018 statistical analysis was reviewed by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting and primary author of the USEPA Unified Guidance. The background update performed during this analysis was reviewed by Dr. Jim Loftis, Civil & Environmental Engineering professor emeritus at Colorado State University and Senior Advisor to Groundwater Stats Consulting.

The following constituents were evaluated:

- **Appendix A** – boron, calcium, chloride, fluoride, pH, sulfate, and TDS

Time series plots for Appendix A parameters at all wells are provided for the purpose of screening data at these wells. Additionally, box plots are included for all constituents at upgradient and downgradient wells. 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. A substitution of the most recent reporting limit was applied when varying detection limits existed in data.

Data at all wells were evaluated during the initial screening for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix A parameters based on site characteristics of groundwater data upgradient of the facility; and 4) eligibility of downgradient wells when intrawell statistical methods are recommended. A few well/constituent pairs have a limited background data set due to later installation dates and sampling differences. As more samples are collected, these well/constituent pairs will meet the minimum power requirements. Power curves are included with this report to demonstrate that the selected statistical methods for Appendix A parameters comply with the USEPA Unified Guidance recommendations as discussed below.

Summary of Statistical Methods

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

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. The distribution of data is tested using the Shapiro-Wilk/Shapiro-Francia test for normality. While the false positive rate associated with the parametric limits is based on an annual 10% 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. 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 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 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 will be necessary to accommodate these types of changes. In the intrawell case, data for all wells and constituents may 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 some cases, the earlier portion of data are deselected prior to construction of limits to provide sensitive limits that will rapidly detect 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.

2024 Background Screening

Outlier Analysis

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 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. Any values not identified by Tukey's, but flagged in the database, reduced variation to construct statistical limits that would be capable of readily detecting changes in groundwater quality conditions. Any values identified by Tukey's test, but not flagged in the database, appeared representative of natural variation or would not greatly reduce variation within the record if flagged. A list of flagged values follows this report.

Seasonality

Based on a visual review of the data, no 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.

Rank Von Neumann

Some wells were sampled approximately on a monthly basis after installation in order to establish initial baseline limits. After that time, sampling was performed on a semi-annual basis to ensure collection of independent groundwater samples as recommended in the EPA Unified Guidance (2009). During this analysis, the Rank Von Neumann serial correlation test was used to evaluate whether the measurements collected for the following wells after their respective installation periods (2017 for wells SP-4 and SP-5R (both upgradient), as well as downgradient wells MW-3D, MW-6D, MW-9D, and MW-15, and 2018 for downgradient wells MW-12D, MW-4D, and MW-5D) represented independent samples, or whether serial correlation was present among the measurements which can result in limits which do not best represent the entire background period. Significant serial correlation was identified for the following upgradient Appendix A well/constituent pairs:

2017:

- Calcium: SP-4 (upgradient)
- Chloride: MW-3D and MW-15
- pH: MW-3D
- Sulfate: SP-4 and SP-5R (both upgradient)

2018:

- None

As a result, the records for these well/constituent pairs were truncated to remove earlier measurements for construction of statistical limits using only more recent data that represent independent samples. Results of the Rank Von Neumann test follow this report.

Appendix A – Determination of Spatial Variation

The Analysis of Variance (ANOVA) was used to statistically evaluate differences in average concentrations among upgradient wells, which 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 and when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective. In the 2018 screening, since no upgradient wells were approved, intrawell prediction limits were used for all parameters.

During this analysis, upgradient wells SP-4 and SP-5R were evaluated to determine variation among the upgradient wells. Statistically significant variation among the well means (parametric ANOVA) or medians (nonparametric ANOVA) was found for the following constituents: boron, calcium, chloride, sulfate, and TDS, suggesting intrawell methods should be considered for these constituents. No differences were noted for fluoride and pH; therefore, these parameters are eligible for interwell prediction limits. Boron, calcium, chloride, sulfate, and TDS data are further evaluated as described below for the appropriateness of intrawell testing to accommodate the groundwater quality. A summary table of the ANOVA results follows this report.

Intrawell Eligibility – Upper Tolerance Limits

Exploratory data analysis was used for general comparison of concentrations in downgradient wells to those in upgradient wells for all Appendix A parameters recommended for intrawell analyses — boron, calcium, chloride, sulfate, and TDS. Upper

tolerance limits for each constituent, using pooled data from the two upgradient wells, were used in conjunction with confidence intervals for each downgradient well/constituent pair to determine whether the estimated averages in downgradient wells are higher than observed levels upgradient of the facility. The upper tolerance limits on pooled upgradient data were constructed to represent the upper range of possible background levels at the site. Those tolerance limits were then compared against downgradient confidence intervals as described below.

In cases where downgradient average concentrations are higher than observed upgradient concentrations for a given constituent, an independent study and hydrogeological investigation would be required to identify local geochemical conditions and expected groundwater quality for the region to justify an intrawell approach. Such an assessment is beyond the scope of services provided by Groundwater Stats Consulting. When there is not an obvious explanation for observed concentration differences in downgradient wells relative to reported concentrations in upgradient wells, interwell prediction limits will be initially be selected for the statistical method until further evidence shows that the observed differences are due to natural variation rather than a result of the facility.

Either parametric or nonparametric tolerance limits were used as appropriate for each well/constituent. Parametric tolerance limits were constructed with a target of 99% confidence and 95% coverage using pooled upgradient well data for each of the parameters. The confidence and coverage levels for nonparametric tolerance limits are dependent upon the number of background samples. As more data are collected, the background population is better represented and the confidence and coverage levels increase. The constructed upper tolerance limits are shown along with time series plots for the two upgradient wells which display the data upon which the upper tolerance limits are based.

Intrawell Eligibility – Confidence Intervals

Confidence intervals were constructed on downgradient wells for each of the Appendix A parameters, and then compared against the tolerance limits discussed above, to determine intrawell eligibility. When the entire confidence interval is above a background tolerance limit for at least one downgradient well for a given parameter, interwell methods are initially recommended. Therefore, only parameters with confidence intervals which did not exceed background tolerance limits at any downgradient well were eligible for intrawell prediction limits. Confidence intervals exceeded their respective limits for at least one downgradient well for the following constituents: boron and sulfate. Therefore, those

two constituents are not eligible for intrawell methods at this time (pending further analysis as discussed above).

Based on the results of the ANOVA test and exploratory data analysis with upper tolerance limits and confidence intervals, interwell prediction limits are recommended for boron, fluoride, pH, and sulfate, while intrawell prediction limits are recommended for calcium, chloride, and TDS.

Trend Test Evaluation

While trends may be visually apparent, quantification of each trend and its statistical 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 at the 99% confidence level. When statistically significant or visually apparent trends are found, the background data record may be truncated as needed in order to remove the trend and improve representation of background groundwater quality for calculation of statistical limits. In cases where historical records of data are truncated, a summary report will be provided to show the date ranges used in construction of the statistical limits.

Trend tests were used to evaluate trends among upgradient wells for constituents being evaluated with interwell prediction limits (boron, fluoride, pH, and sulfate), and among all wells for constituents being evaluated with intrawell prediction limits (calcium, chloride, and TDS). Significant trends were identified for the following well/constituent pairs:

Increasing

- Calcium: MW-15
- Chloride: SP-5R (upgradient)
- Sulfate: SP-4 (upgradient) 1
- TDS: SP-5R (upgradient)

Decreasing

- Boron: SP-4 and SP-5R (both upgradient)
- Calcium: MW-12D
- Chloride: MW-12D and MW-15
- TDS: MW-12D

Trends noted in upgradient wells are generally an indication that concentrations are changing for reasons unrelated to the facility.

While identifying these upgradient and downgradient trends is useful for understanding and characterization of background groundwater quality, truncation of the records to remove the trends is appropriate when the trends result in statistical limits that are not representative of background groundwater quality. No records required any adjustments at this time since those identified with statistically significant trends either had concentrations similar to those among upgradient wells or concentrations within the same respective well later in the record.

Statistical Limits

Intrawell Prediction Limits

Intrawell prediction limits were constructed with a 1-of-2 resample plan using reported data through October 2023 for calcium, chloride, and TDS, and a summary of the updated limits follows this letter. Note that due to sampling differences, the record for calcium at MW-13D uses data through June 2023 and the record for TDS at MW-9D extends through December 2023. Future compliance observations at each well will be compared to these background limits after each subsequent semi-annual sampling event. All records will be re-evaluated for updating prediction limits when a minimum of 4 compliance samples is available.

Interwell Prediction Limits

Interwell prediction limits, combined with a 1-of-2 resample plan, were updated using all available data from upgradient wells through October 2023 for boron, fluoride, pH, and sulfate. Interwell prediction limits pool upgradient well data to establish a background limit for an individual constituent. A summary table of the updated limits may be found following this letter in the Prediction Limit Summary Tables.

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

For Groundwater Stats Consulting,

Andrew Collins
Project Manager

Kristina L. Rayner
Senior Statistician

Date Ranges

Date: 12/2/2024 4:43 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Calcium (mg/L)
- SP-4 overall:7/30/2018-10/10/2023

Chloride (mg/L)
- MW-3D overall:5/30/2018-10/10/2023
- MW-15 overall:5/30/2018-10/10/2023

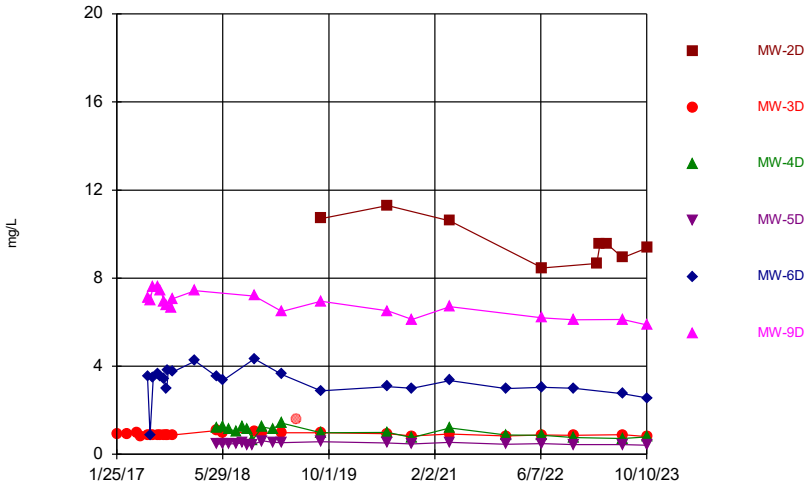
pH, field (SU)
- MW-3D overall:5/30/2018-10/10/2023

Sulfate (mg/L)
- SP-4 overall:5/30/2018-10/10/2023
- SP-5R overall:5/30/2018-10/10/2023

FIGURE A

Time Series

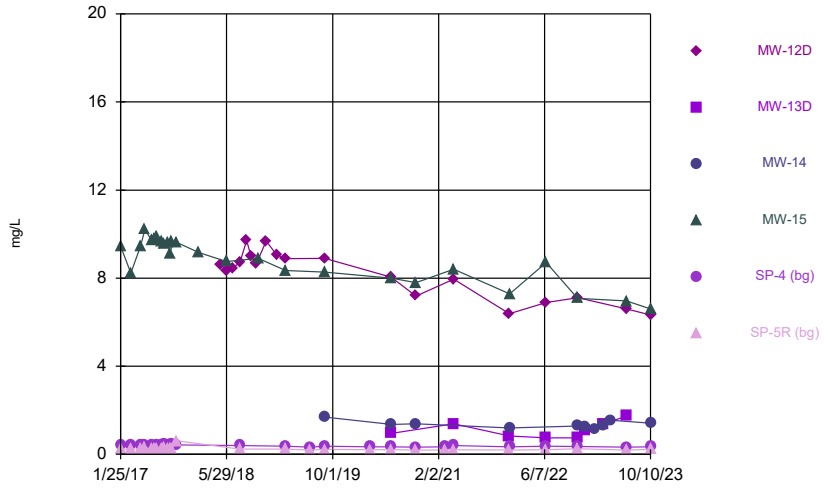
Time Series



Constituent: Boron Analysis Run 12/2/2024 5:05 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Time Series



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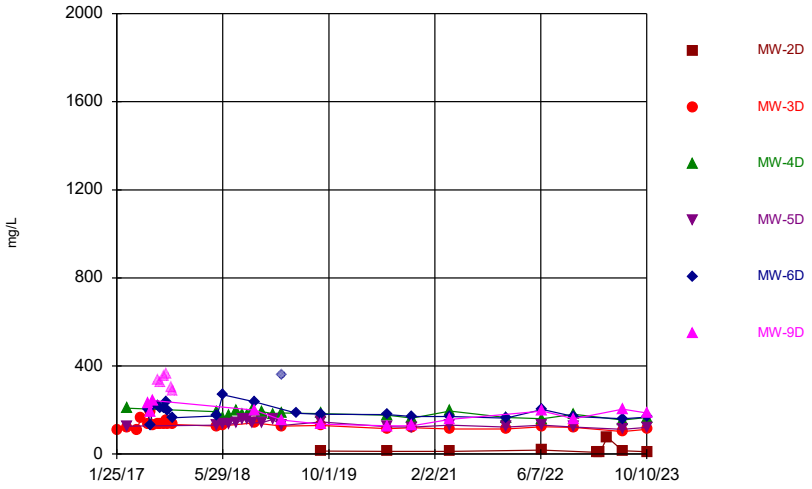
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Time Series



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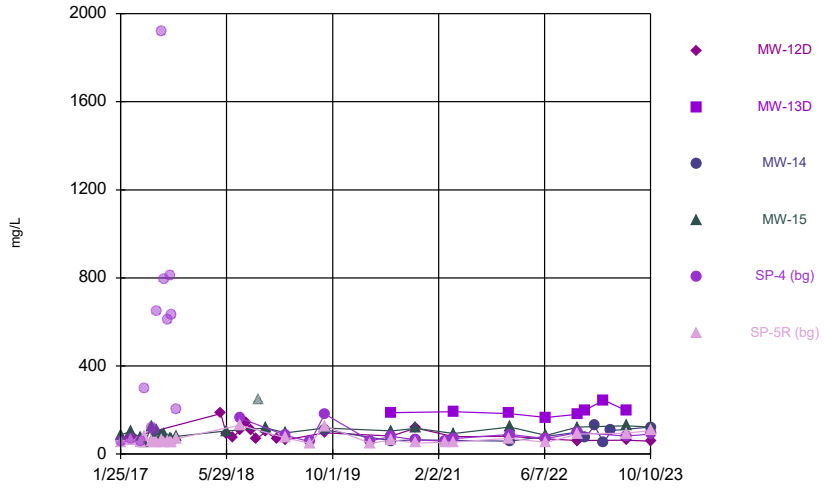
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Calcium Analysis Run 12/2/2024 5:05 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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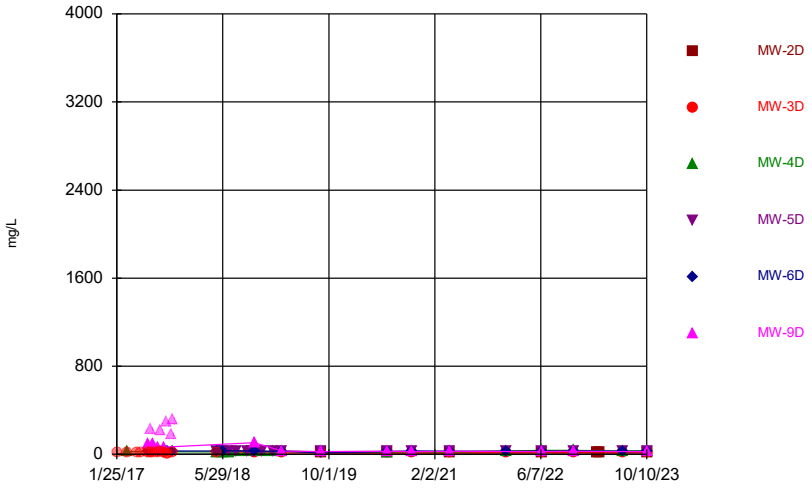
Time Series

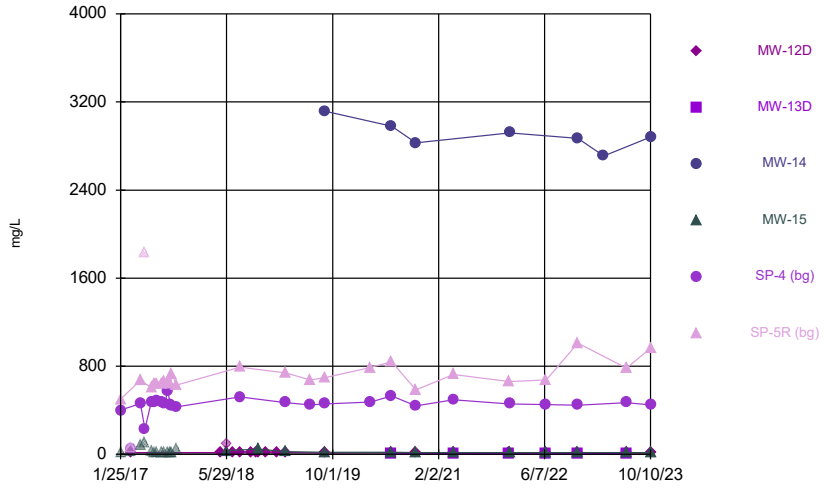


Constituent: Chloride Analysis Run 12/2/2024 5:05 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Chloride Analysis Run 12/2/2024 5:05 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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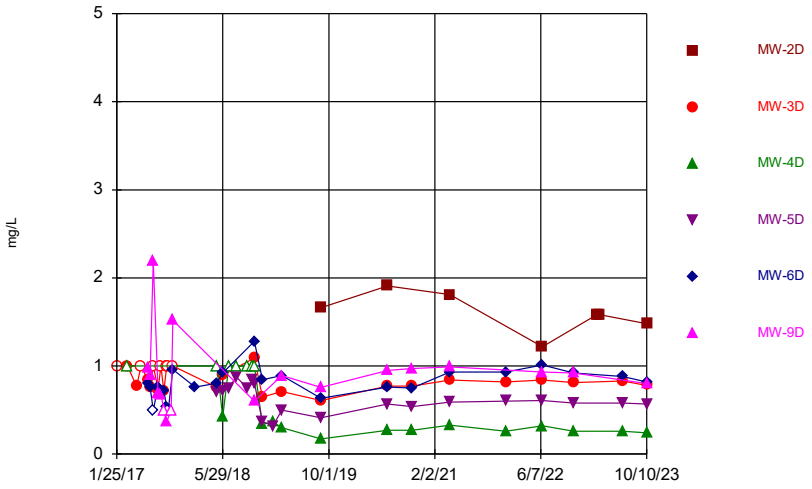
Hollow symbols indicate censored values.

Time Series



Constituent: Fluoride Analysis Run 12/2/2024 5:06 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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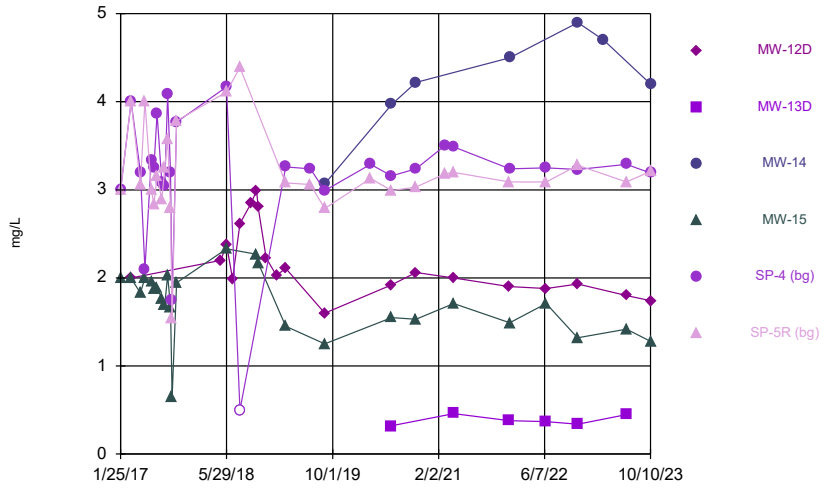
Hollow symbols indicate censored values.

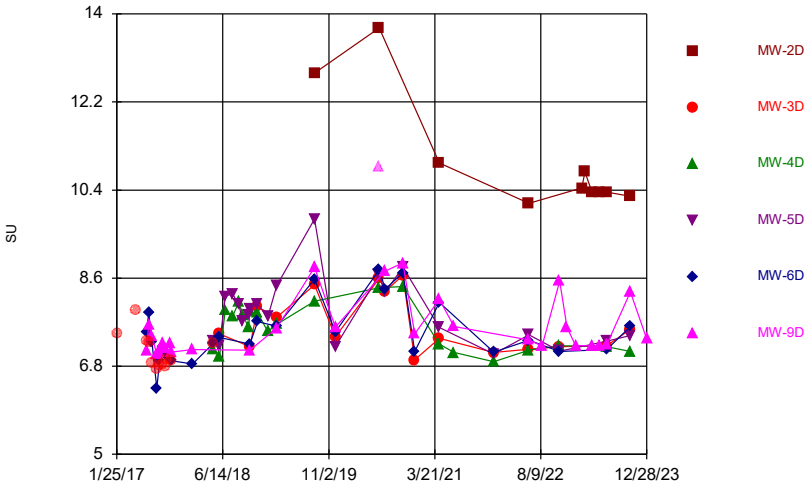
Time Series



Constituent: Fluoride Analysis Run 12/2/2024 5:06 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Time Series



Constituent: pH, field Analysis Run 12/2/2024 5:06 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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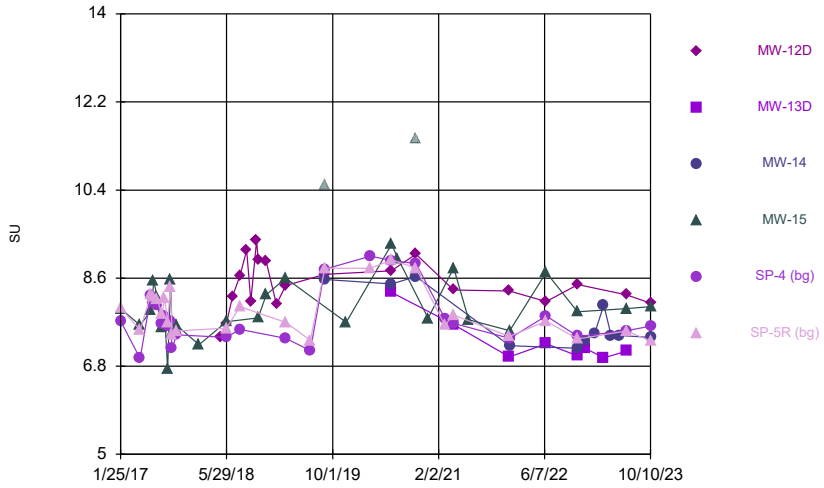
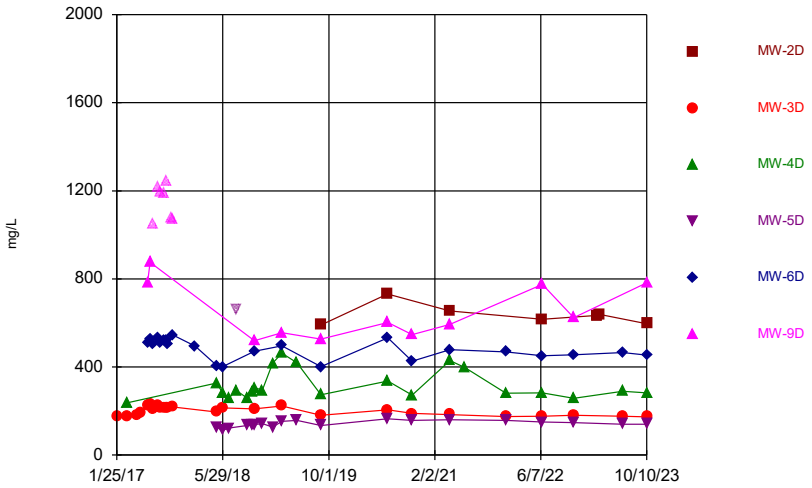
Time Series



Constituent: pH, field Analysis Run 12/2/2024 5:06 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

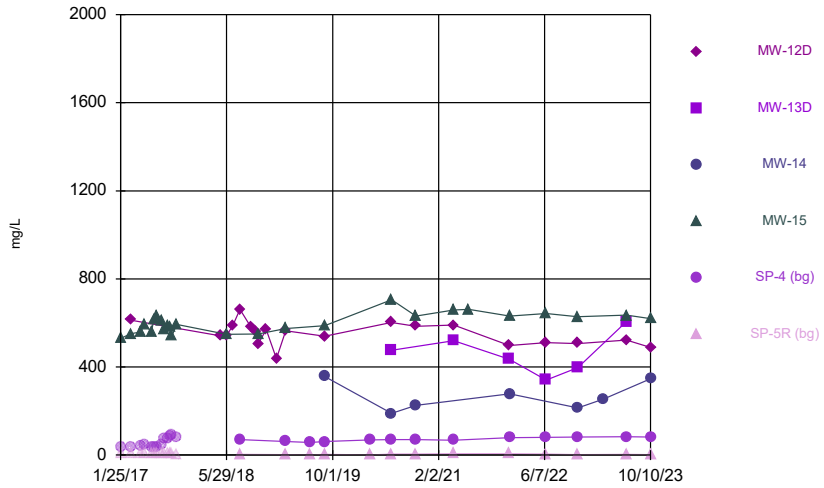
Time Series



Constituent: Sulfate Analysis Run 12/2/2024 5:06 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

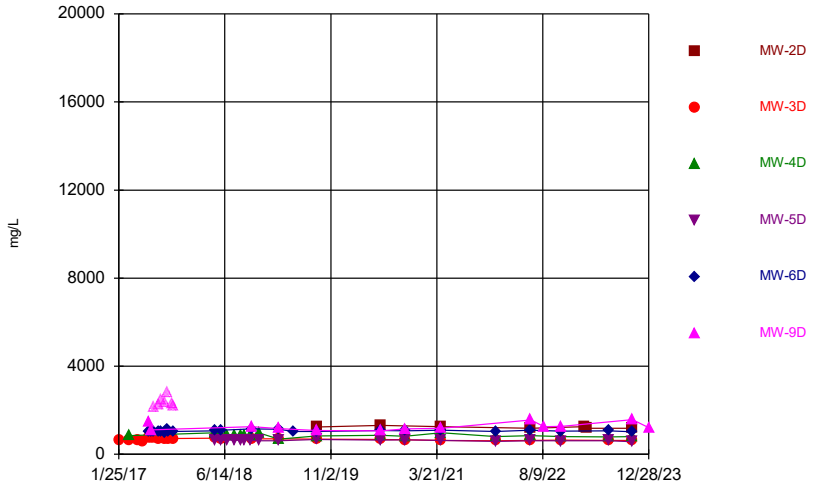
Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Sulfate Analysis Run 12/2/2024 5:06 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Time Series

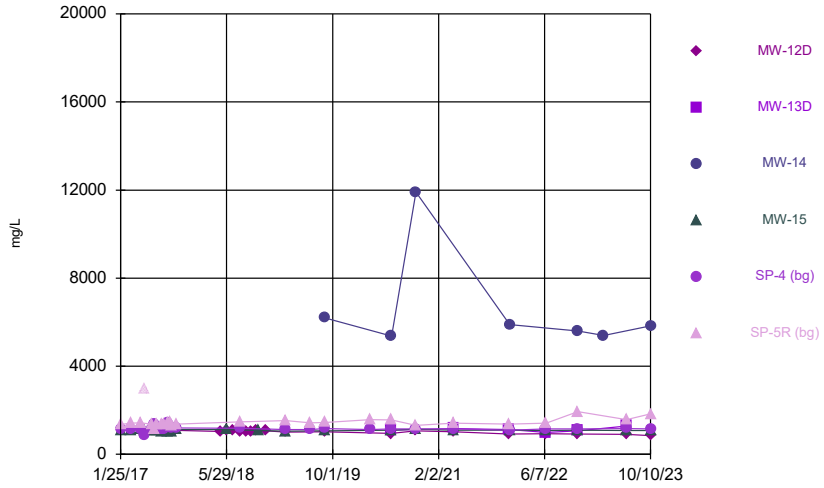


Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 5:06 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Time Series



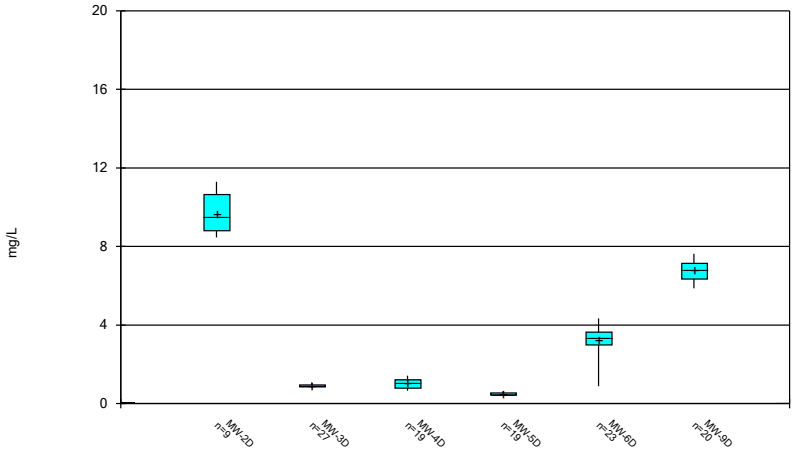
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 5:06 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE B

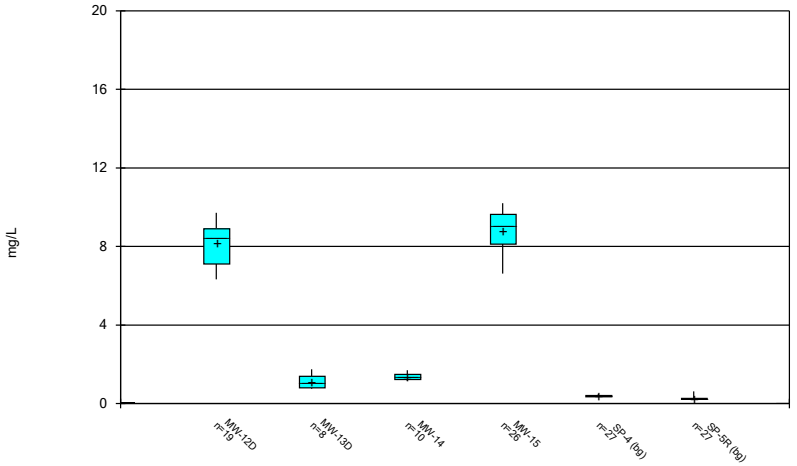
Box Plots

Box & Whiskers Plot



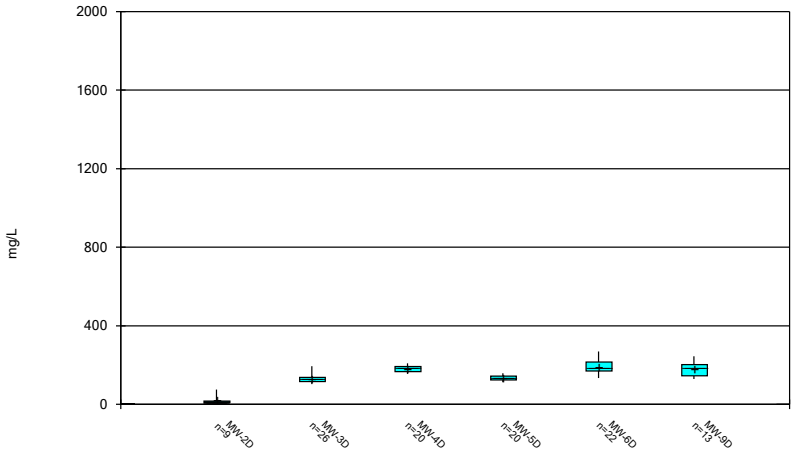
Constituent: Boron Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



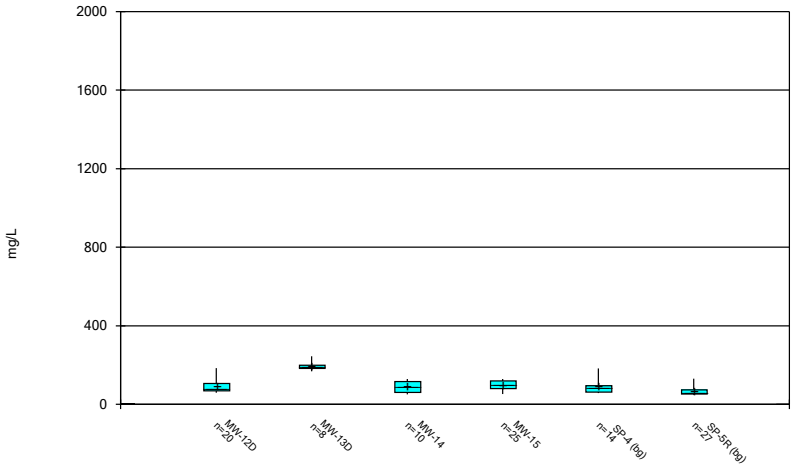
Constituent: Boron Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



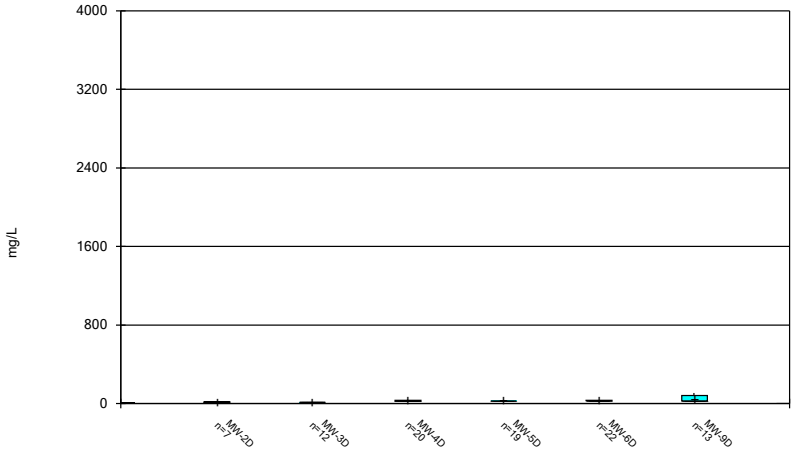
Constituent: Calcium Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



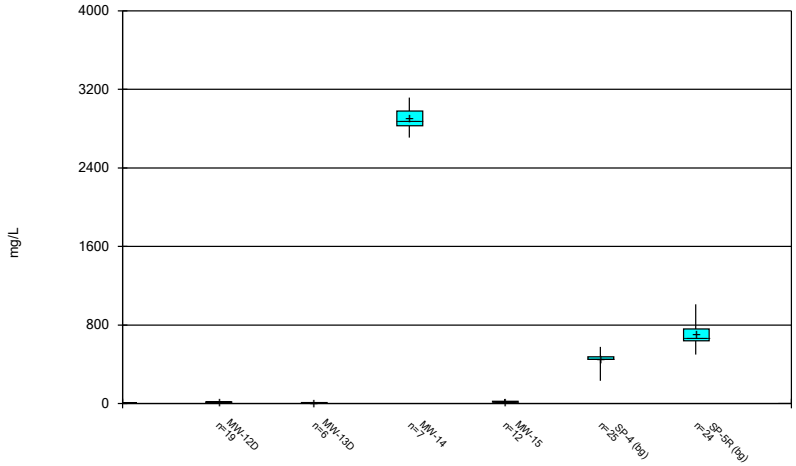
Constituent: Calcium Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



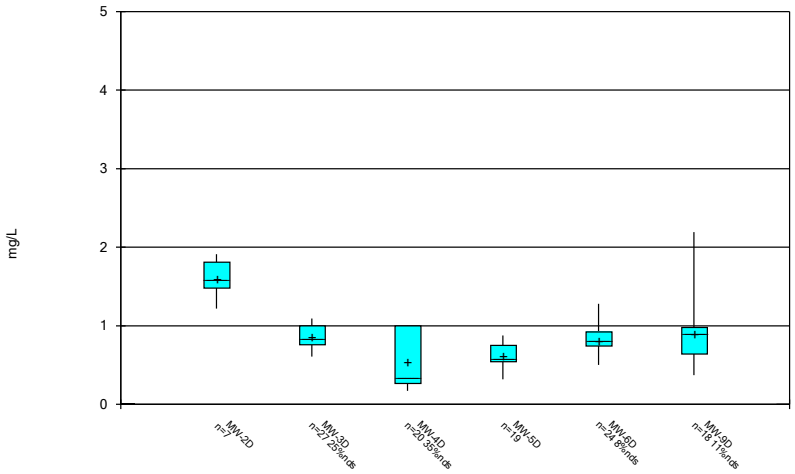
Constituent: Chloride Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



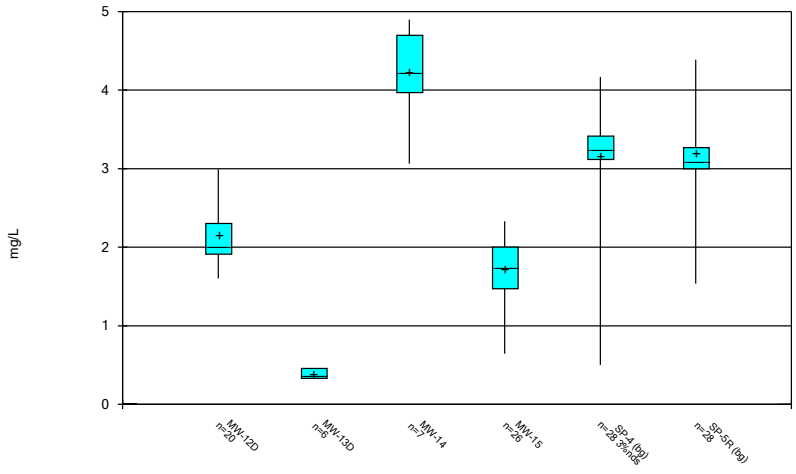
Constituent: Chloride Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



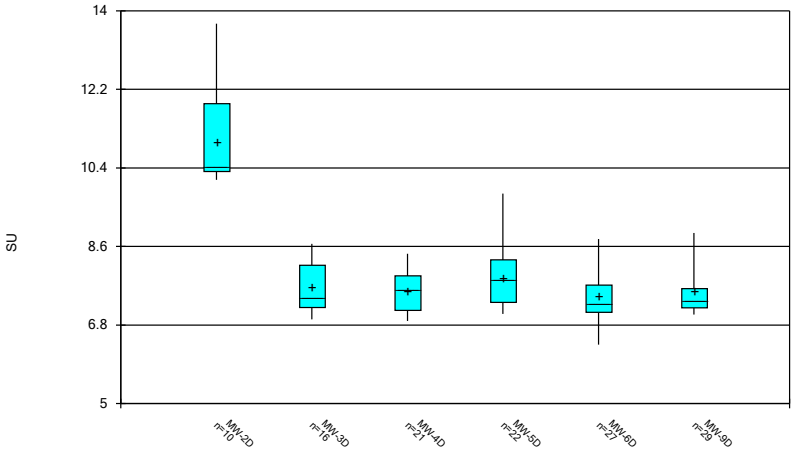
Constituent: Fluoride Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



Constituent: Fluoride Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



Constituent: pH, field Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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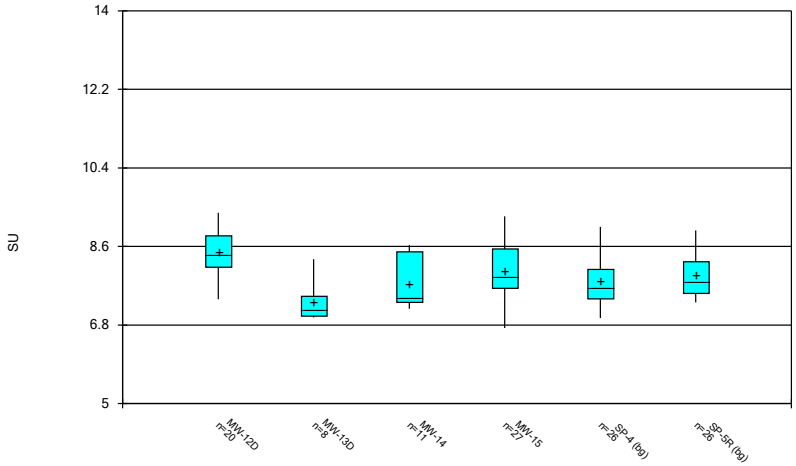
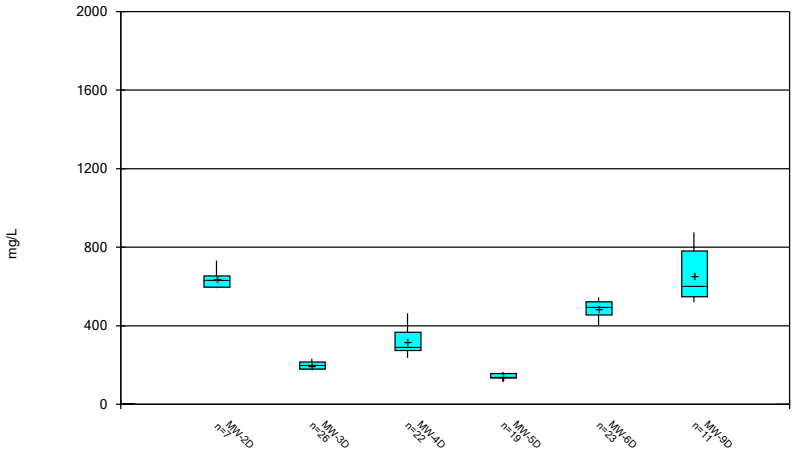
Box & Whiskers Plot



Constituent: pH, field Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

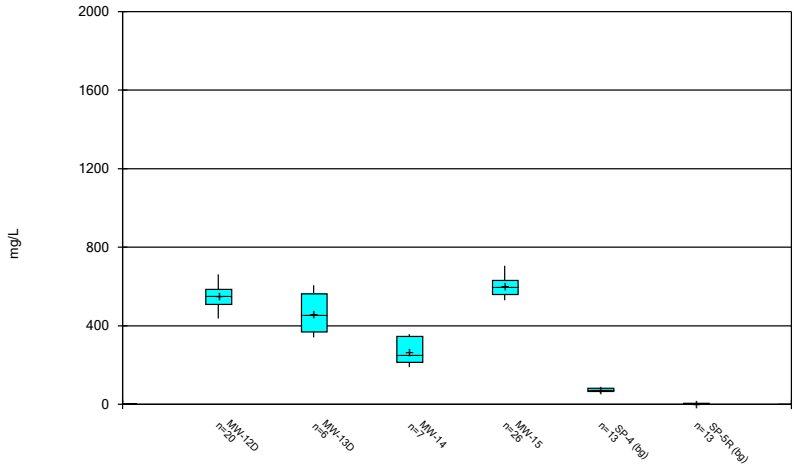
Box & Whiskers Plot



Constituent: Sulfate Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

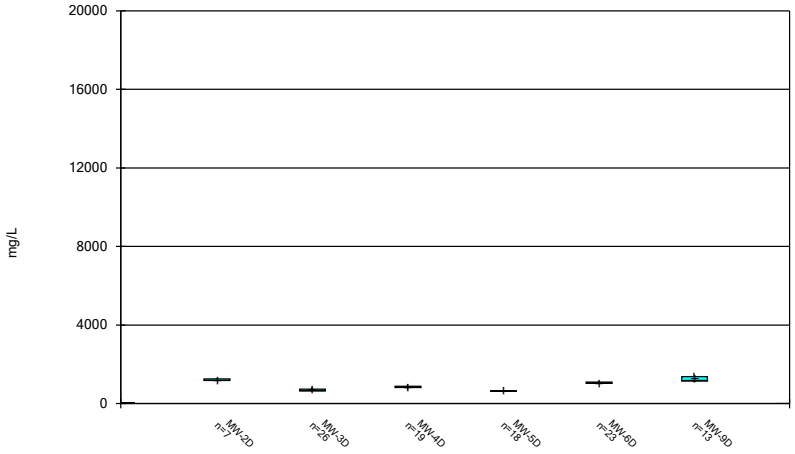
Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

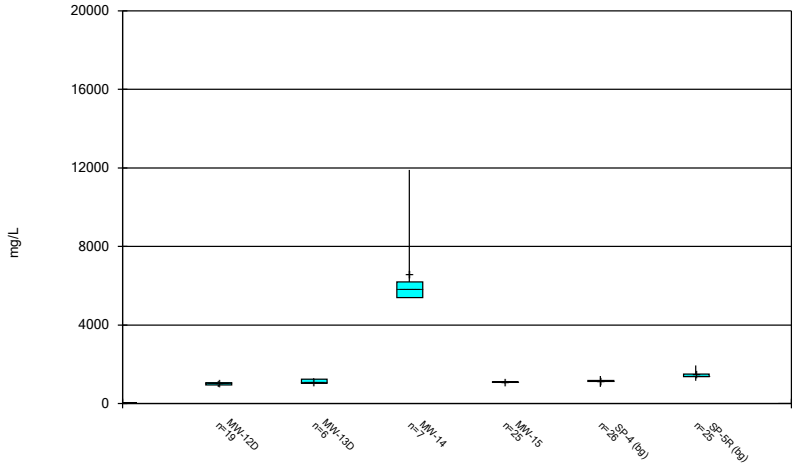
Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 5:08 PM
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE C

Outlier Summary and Tukey's Outlier Test

Outlier Summary

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 5:05 PM

	MW-3D Boron (mg/L)	MW-6D Calcium (mg/L)	MW-9D Calcium (mg/L)	MW-15 Calcium (mg/L)	SP-4 Calcium (mg/L)	MW-3D Chloride (mg/L)	MW-9D Chloride (mg/L)	MW-12D Chloride (mg/L)	SP-4 Chloride (mg/L)	SP-5R Chloride (mg/L)
3/15/2017									52 (O)	62 (O)
5/18/2017										1834 (O)
6/28/2017							232 (O)			
7/12/2017										
8/4/2017			337 (O)		1920 (O)					
8/17/2017			328 (O)			23 (O)	216 (O)			
8/30/2017			354 (O)							
9/13/2017			366 (O)				293 (O)			
10/4/2017			304 (O)				180 (O)			
10/11/2017			288 (O)				314 (O)			
5/30/2018								91 (O)		
7/31/2018										
10/22/2018				250 (O)						
2/27/2019		360 (O)								
5/7/2019	1.56 (O)									
8/26/2019										
6/30/2020										
10/21/2020										

	MW-9D pH, field (SU)	MW-15 pH, field (SU)	MW-5D Sulfate (mg/L)	MW-9D Sulfate (mg/L)	MW-9D Total Dissolved Solids [TDS] (mg/L)	SP-5R Total Dissolved Solids [TDS] (mg/L)
3/15/2017						
5/18/2017					3008 (O)	
6/28/2017						
7/12/2017				1048 (O)	2146 (O)	
8/4/2017				1217 (O)	2256 (O)	
8/17/2017				1193 (O)	2486 (O)	
8/30/2017				1192 (O)	2392 (O)	
9/13/2017				1244 (O)	2826 (O)	
10/4/2017				1079 (O)	2296 (O)	
10/11/2017				1075 (O)	2188 (O)	
5/30/2018						
7/31/2018			662 (O)			
10/22/2018						
2/27/2019						
5/7/2019						
8/26/2019		10.51 (O)				
6/30/2020	10.87 (O)					
10/21/2020		11.45 (O)				

Tukey's Outlier Test - Significant Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 11/25/2024, 5:40 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron (mg/L)	MW-3D	Yes	1.56	NP	NaN	28	0.922	0.1421	ln(x)	ShapiroWilk
Boron (mg/L)	SP-5R (bg)	Yes	0.61	NP	NaN	27	0.2459	0.07902	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-3D	Yes	23	NP	NaN	26	13.26	2.259	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-12D	Yes	91	NP	NaN	20	19.88	16.98	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-15	Yes	111	NP	NaN	25	27.46	22.45	ln(x)	ShapiroWilk
Chloride (mg/L)	SP-4 (bg)	Yes	52,576	NP	NaN	26	443.2	98.35	x^4	ShapiroWilk
Chloride (mg/L)	SP-5R (bg)	Yes	62,1834	NP	NaN	26	724.7	281.3	sqrt(x)	ShapiroWilk
Fluoride (mg/L)	SP-4 (bg)	Yes	4.17,0.5	NP	NaN	28	3.169	0.7217	x^3	ShapiroWilk
Fluoride (mg/L)	SP-5R (bg)	Yes	4,4,1.535,4.11,4.39	NP	NaN	28	3.2	0.5304	x^2	ShapiroWilk
pH, field (SU)	MW-9D	Yes	10.87	NP	NaN	30	7.681	0.82	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-5D	Yes	662	NP	NaN	20	168.4	117	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	SP-4 (bg)	Yes	846,1388,1400	NP	NaN	26	1160	96.17	x^2	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	SP-5R (bg)	Yes	3008	NP	NaN	26	1513	342.6	ln(x)	ShapiroWilk

Tukey's Outlier Test - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 11/25/2024, 5:40 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron (mg/L)	MW-2D	No	n/a	NP	NaN	9	9.679	0.9824	ln(x)	ShapiroWilk
Boron (mg/L)	**MW-3D**	**Yes**	**1.56**	**NP**	**NaN**	**28**	**0.922**	**0.1421**	**ln(x)**	**ShapiroWilk**
Boron (mg/L)	MW-4D	No	n/a	NP	NaN	19	1.026	0.2237	x^2	ShapiroWilk
Boron (mg/L)	MW-5D	No	n/a	NP	NaN	19	0.4909	0.05004	ln(x)	ShapiroWilk
Boron (mg/L)	MW-6D	No	n/a	NP	NaN	23	3.248	0.6811	x^2	ShapiroWilk
Boron (mg/L)	MW-9D	No	n/a	NP	NaN	20	6.796	0.5322	x^2	ShapiroWilk
Boron (mg/L)	MW-12D	No	n/a	NP	NaN	19	8.137	1.079	x^4	ShapiroWilk
Boron (mg/L)	MW-13D	No	n/a	NP	NaN	8	1.11	0.3625	ln(x)	ShapiroWilk
Boron (mg/L)	MW-14	No	n/a	NP	NaN	10	1.36	0.1631	ln(x)	ShapiroWilk
Boron (mg/L)	MW-15	No	n/a	NP	NaN	26	8.774	1.007	x^5	ShapiroWilk
Boron (mg/L)	SP-4 (bg)	No	n/a	NP	NaN	27	0.3845	0.04401	ln(x)	ShapiroWilk
Boron (mg/L)	**SP-5R (bg)**	**Yes**	**0.61**	**NP**	**NaN**	**27**	**0.2459**	**0.07902**	**ln(x)**	**ShapiroWilk**
Calcium (mg/L)	MW-2D	No	n/a	NP	NaN	9	19.54	21.21	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-3D	No	n/a	NP	NaN	26	129.9	18.88	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-4D	No	n/a	NP	NaN	20	180	14.42	normal	ShapiroWilk
Calcium (mg/L)	MW-5D	No	n/a	NP	NaN	20	134.5	12.79	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-6D	No	n/a	NP	NaN	23	199.3	46.77	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-9D	No	n/a	NP	NaN	19	225.9	79.95	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-12D	No	n/a	NP	NaN	20	89.94	31.04	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-13D	No	n/a	NP	NaN	8	194.1	22.91	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-14	No	n/a	NP	NaN	10	87.61	28.95	x^(1/3)	ShapiroWilk
Calcium (mg/L)	MW-15	No	n/a	NP	NaN	26	103	37.02	ln(x)	ShapiroWilk
Calcium (mg/L)	SP-4 (bg)	No	n/a	NP	NaN	27	280.6	408.3	ln(x)	ShapiroWilk
Calcium (mg/L)	SP-5R (bg)	No	n/a	NP	NaN	27	67.76	23.18	ln(x)	ShapiroWilk
Chloride (mg/L)	**MW-3D**	**Yes**	**23**	**NP**	**NaN**	**26**	**13.26**	**2.259**	**ln(x)**	**ShapiroWilk**
Chloride (mg/L)	MW-4D	No	n/a	NP	NaN	20	28.36	6.157	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-5D	No	n/a	NP	NaN	19	26.59	2.147	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-6D	No	n/a	NP	NaN	22	28.64	3.974	x^6	ShapiroWilk
Chloride (mg/L)	MW-9D	No	n/a	NP	NaN	18	104	99.05	ln(x)	ShapiroWilk
Chloride (mg/L)	**MW-12D**	**Yes**	**91**	**NP**	**NaN**	**20**	**19.88**	**16.98**	**ln(x)**	**ShapiroWilk**
Chloride (mg/L)	**MW-15**	**Yes**	**111**	**NP**	**NaN**	**25**	**27.46**	**22.45**	**ln(x)**	**ShapiroWilk**
Chloride (mg/L)	**SP-4 (bg)**	**Yes**	**52,576**	**NP**	**NaN**	**26**	**443.2**	**98.35**	**x^4**	**ShapiroWilk**
Chloride (mg/L)	**SP-5R (bg)**	**Yes**	**62,1834**	**NP**	**NaN**	**26**	**724.7**	**281.3**	**sqrt(x)**	**ShapiroWilk**
Fluoride (mg/L)	MW-3D	No	n/a	NP	NaN	27	0.8518	0.1291	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-4D	No	n/a	NP	NaN	20	0.5403	0.3497	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-5D	No	n/a	NP	NaN	19	0.6148	0.1542	normal	ShapiroWilk
Fluoride (mg/L)	MW-6D	No	n/a	NP	NaN	24	0.8088	0.1711	sqrt(x)	ShapiroWilk
Fluoride (mg/L)	MW-9D	No	n/a	NP	NaN	18	0.8971	0.412	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-12D	No	n/a	NP	NaN	20	2.15	0.3846	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-15	No	n/a	NP	NaN	26	1.722	0.369	x^2	ShapiroWilk
Fluoride (mg/L)	**SP-4 (bg)**	**Yes**	**4.17,0.5**	**NP**	**NaN**	**28**	**3.169**	**0.7217**	**x^3**	**ShapiroWilk**
Fluoride (mg/L)	**SP-5R (bg)**	**Yes**	**4,4,1.535,4.11,4.39**	**NP**	**NaN**	**28**	**3.2**	**0.5304**	**x^2**	**ShapiroWilk**
pH, field (SU)	MW-2D	No	n/a	NP	NaN	10	11.01	1.222	ln(x)	ShapiroWilk
pH, field (SU)	MW-3D	No	n/a	NP	NaN	28	7.415	0.5632	ln(x)	ShapiroWilk
pH, field (SU)	MW-4D	No	n/a	NP	NaN	21	7.583	0.4755	ln(x)	ShapiroWilk
pH, field (SU)	MW-5D	No	n/a	NP	NaN	22	7.897	0.6701	ln(x)	ShapiroWilk
pH, field (SU)	MW-6D	No	n/a	NP	NaN	27	7.468	0.599	ln(x)	ShapiroWilk
pH, field (SU)	**MW-9D**	**Yes**	**10.87**	**NP**	**NaN**	**30**	**7.681**	**0.82**	**ln(x)**	**ShapiroWilk**
pH, field (SU)	MW-12D	No	n/a	NP	NaN	20	8.46	0.5016	x^2	ShapiroWilk
pH, field (SU)	MW-13D	No	n/a	NP	NaN	8	7.309	0.4607	ln(x)	ShapiroWilk
pH, field (SU)	MW-14	No	n/a	NP	NaN	11	7.741	0.5735	ln(x)	ShapiroWilk
pH, field (SU)	MW-15	No	n/a	NP	NaN	29	8.214	0.9507	ln(x)	ShapiroWilk
pH, field (SU)	SP-4 (bg)	No	n/a	NP	NaN	26	7.801	0.5682	ln(x)	ShapiroWilk
pH, field (SU)	SP-5R (bg)	No	n/a	NP	NaN	26	7.93	0.5058	ln(x)	ShapiroWilk

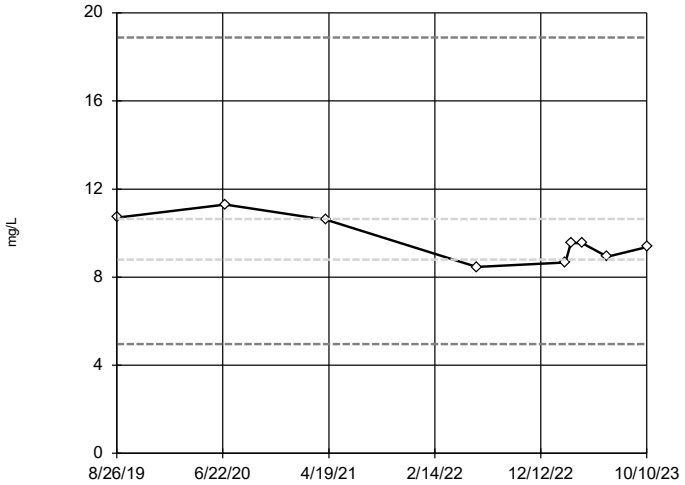
Tukey's Outlier Test - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 11/25/2024, 5:40 PM

Constituent	Well	Outlier	Value(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Sulfate (mg/L)	MW-3D	No	n/a	NP	NaN	26	199.1	19.66	x^4	ShapiroWilk
Sulfate (mg/L)	MW-4D	No	n/a	NP	NaN	22	315.9	65.33	ln(x)	ShapiroWilk
Sulfate (mg/L)	**MW-5D**	**Yes**	**662**	**NP**	**NaN**	**20**	**168.4**	**117**	**ln(x)**	**ShapiroWilk**
Sulfate (mg/L)	MW-6D	No	n/a	NP	NaN	23	481.4	43.57	x^5	ShapiroWilk
Sulfate (mg/L)	MW-9D	No	n/a	NP	NaN	18	846.1	271.5	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-12D	No	n/a	NP	NaN	20	550.3	51.64	normal	ShapiroWilk
Sulfate (mg/L)	MW-15	No	n/a	NP	NaN	26	600.4	43.51	ln(x)	ShapiroWilk
Sulfate (mg/L)	SP-4 (bg)	No	n/a	NP	NaN	26	64	17.88	x^3	ShapiroWilk
Sulfate (mg/L)	SP-5R (bg)	No	n/a	NP	NaN	26	5.554	2.595	normal	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-3D	No	n/a	NP	NaN	26	689.2	55.02	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-4D	No	n/a	NP	NaN	19	859.1	70.4	normal	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-5D	No	n/a	NP	NaN	18	630.2	23.9	x^5	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-6D	No	n/a	NP	NaN	23	1059	43.27	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-9D	No	n/a	NP	NaN	20	1647	575.2	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-12D	No	n/a	NP	NaN	19	1011	75.06	x^5	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-15	No	n/a	NP	NaN	25	1086	29.45	x^5	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	**SP-4 (bg)**	**Yes**	**846,1388,1400**	**NP**	**NaN**	**26**	**1160**	**96.17**	**x^2**	**ShapiroWilk**
Total Dissolved Solids [TDS] (mg/L)	**SP-5R (bg)**	**Yes**	**3008**	**NP**	**NaN**	**26**	**1513**	**342.6**	**ln(x)**	**ShapiroWilk**

Tukey's Outlier Screening

MW-2D



n = 9

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 = 18.88, low cutoff = 4.963, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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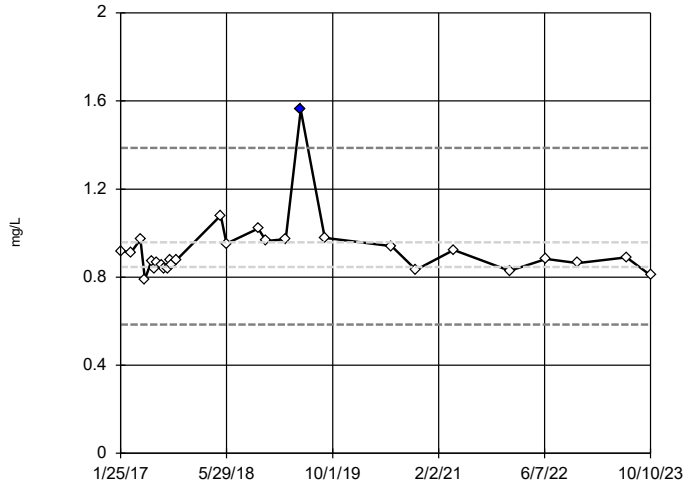
Tukey's Outlier Screening

MW-3D



n = 28

Outlier is drawn as solid. Tukey's method selected by user.

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

High cutoff = 1.386, low cutoff = 0.5854, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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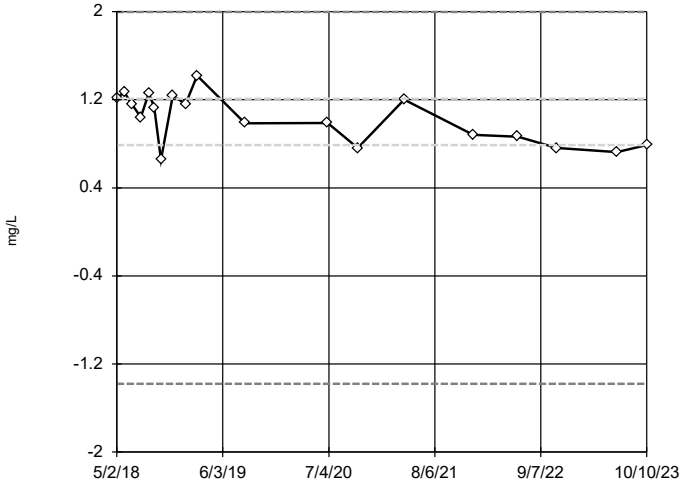
Tukey's Outlier Screening

MW-4D



n = 19

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 = 1.997, low cutoff = -1.379, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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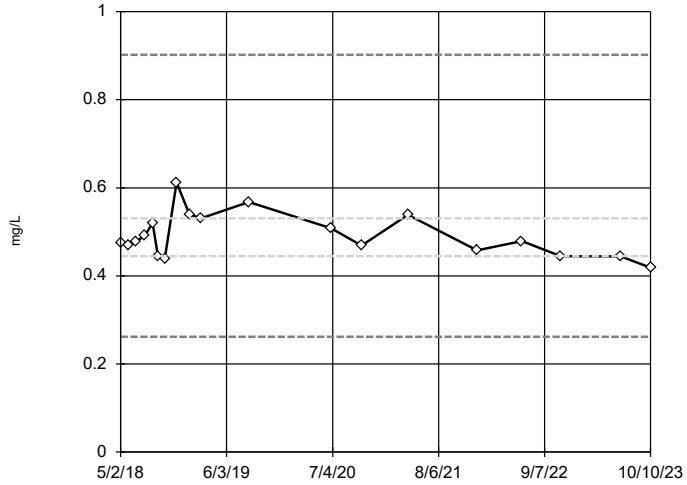
Tukey's Outlier Screening

MW-5D



n = 19

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

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

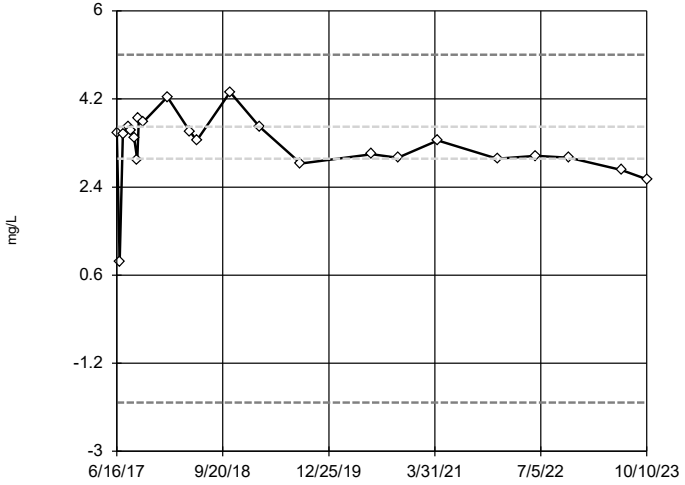
High cutoff = 0.9022, low cutoff = 0.2619, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-6D



n = 23

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 = 5.106, low cutoff = -2.002, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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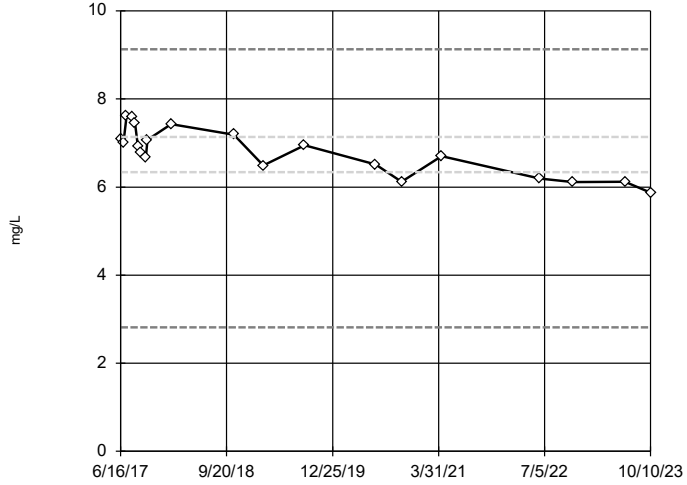
Tukey's Outlier Screening

MW-9D



n = 20

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

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

High cutoff = 9.125, low cutoff = 2.815, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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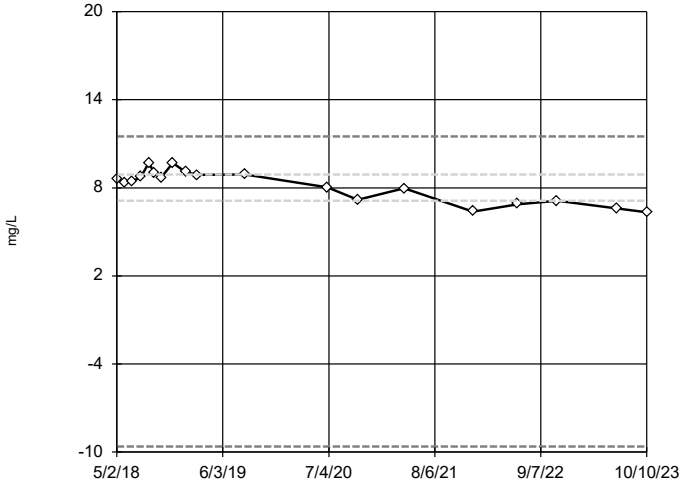
Tukey's Outlier Screening

MW-12D



n = 19

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 = 11.49, low cutoff = -9.63, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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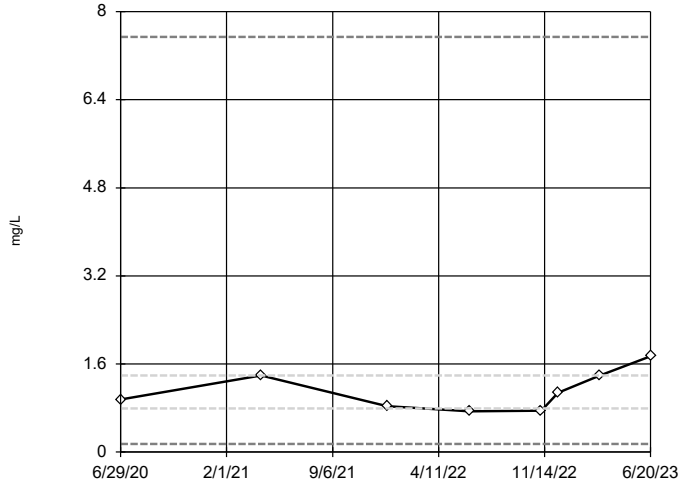
Tukey's Outlier Screening

MW-13D



n = 8

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

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

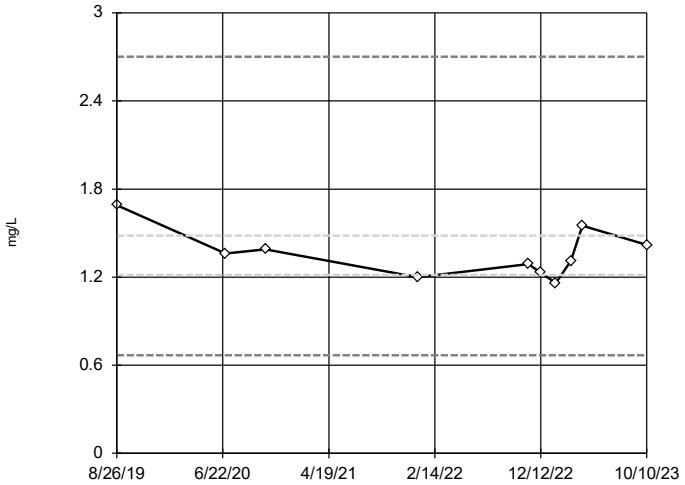
High cutoff = 7.543, low cutoff = 0.1458, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-14



n = 10

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

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

High cutoff = 2.702, low cutoff = 0.6672, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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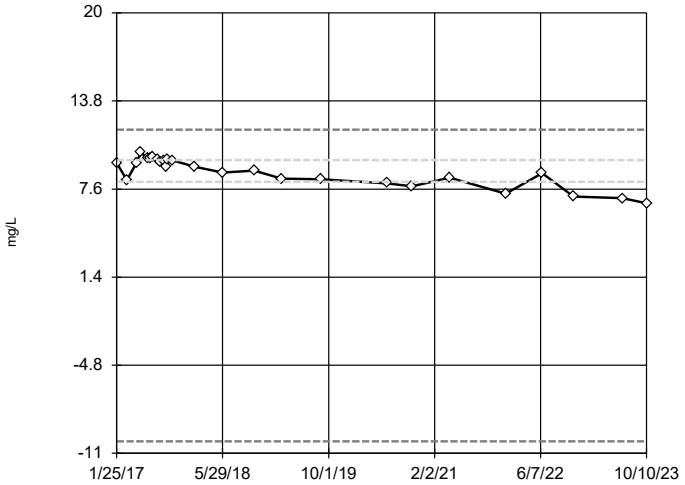
Tukey's Outlier Screening

MW-15



n = 26

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

Data were x^5 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 11.77, low cutoff = -10.16, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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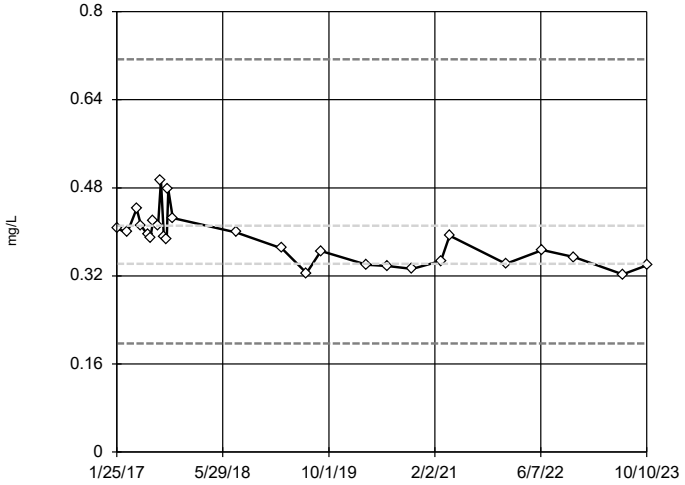
Tukey's Outlier Screening

SP-4 (bg)



n = 27

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 = 0.7133, low cutoff = 0.1971, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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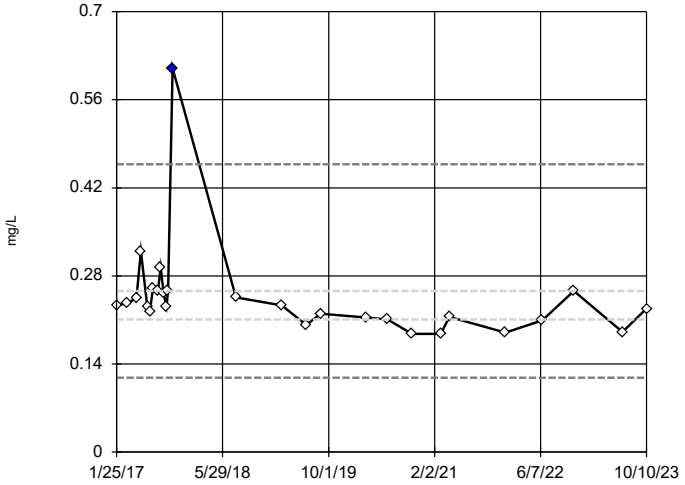
Tukey's Outlier Screening

SP-5R (bg)



n = 27

Outlier is drawn as solid. Tukey's method selected by user.

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

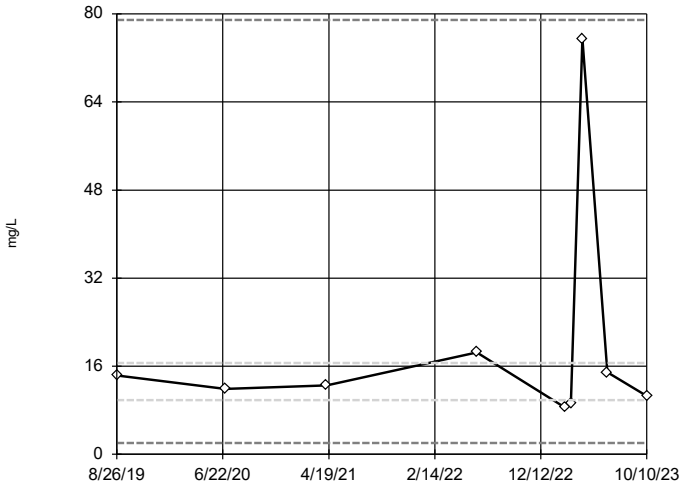
High cutoff = 0.4572, low cutoff = 0.1181, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-2D



n = 9

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 = 78.9, low cutoff = 2.078, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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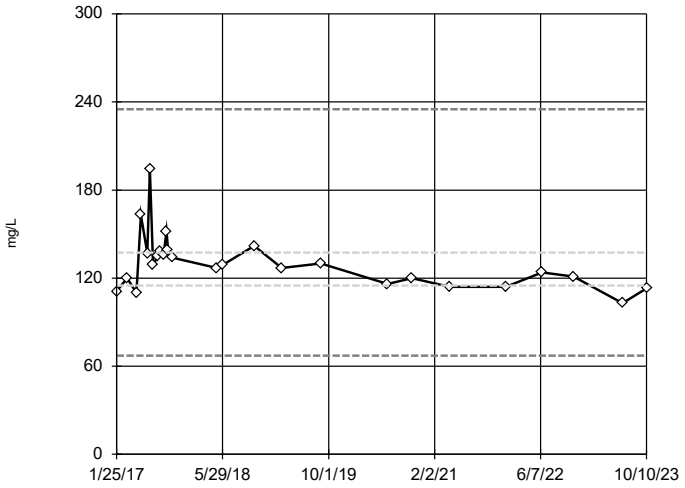
Tukey's Outlier Screening

MW-3D



n = 26

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 = 235, low cutoff = 67.27, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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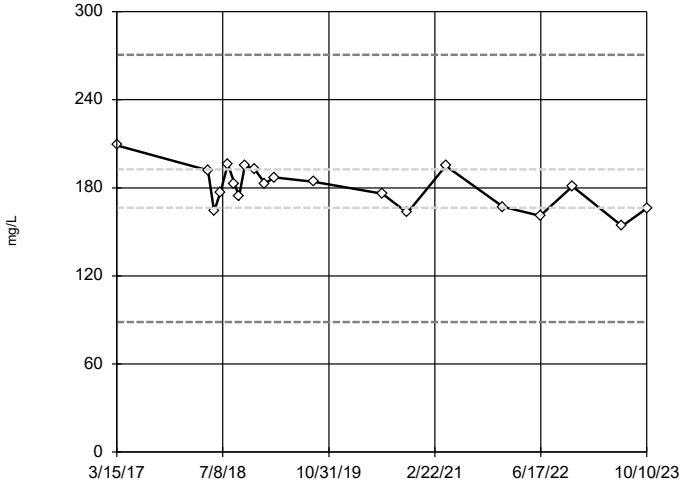
Tukey's Outlier Screening

MW-4D



n = 20

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 270.5, low cutoff = 88.5, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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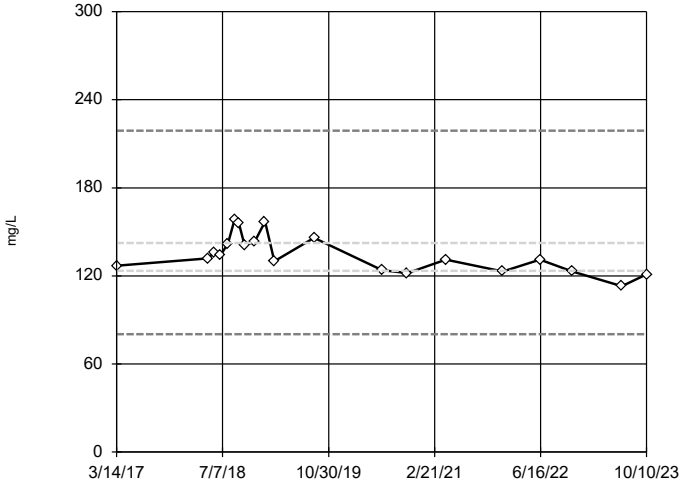
Tukey's Outlier Screening

MW-5D



n = 20

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

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

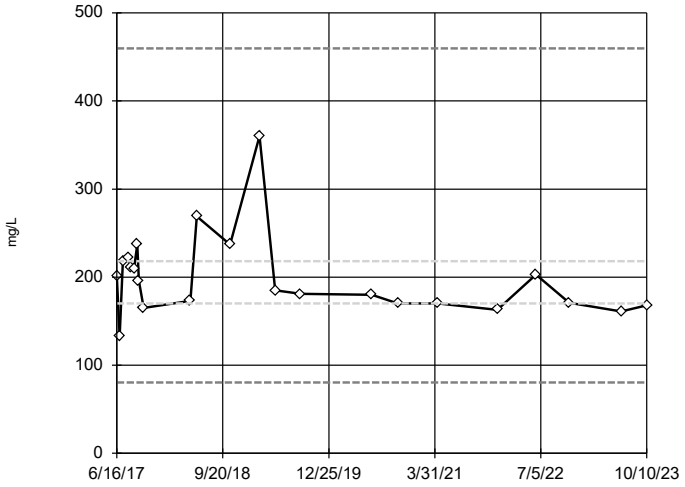
High cutoff = 218.9, low cutoff = 80.39, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-6D



n = 23

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 = 459.7, low cutoff = 80.62, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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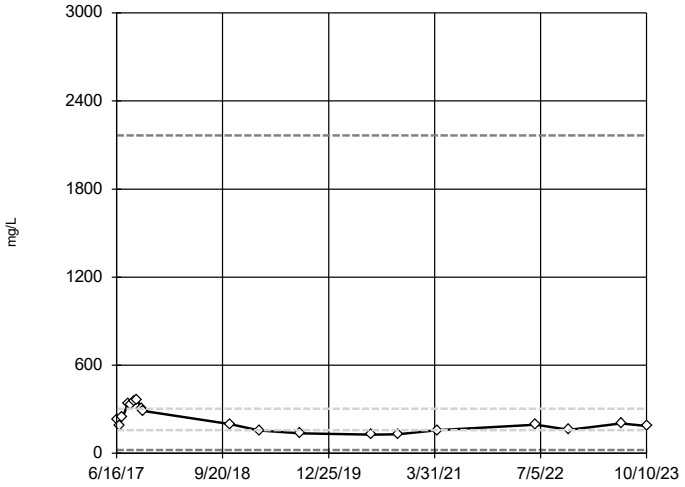
Tukey's Outlier Screening

MW-9D



n = 19

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 = 2165, low cutoff = 22.18, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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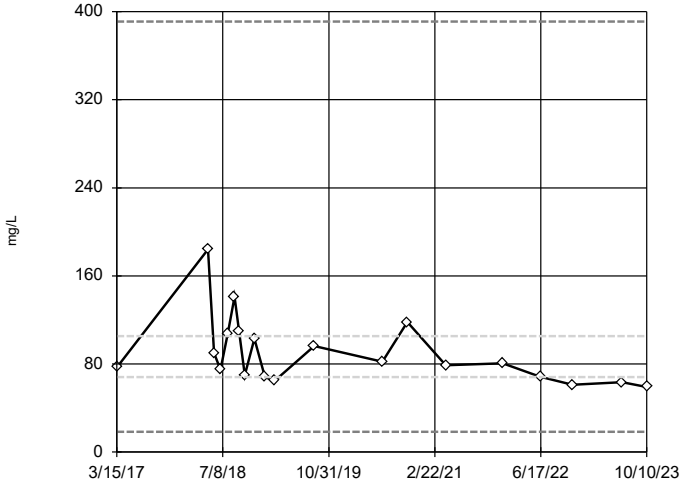
Tukey's Outlier Screening

MW-12D



n = 20

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

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

High cutoff = 391, low cutoff = 18.39, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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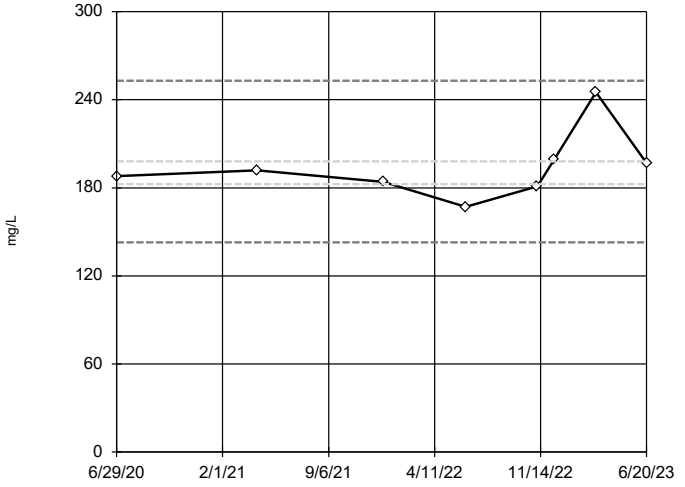
Tukey's Outlier Screening

MW-13D



n = 8

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

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

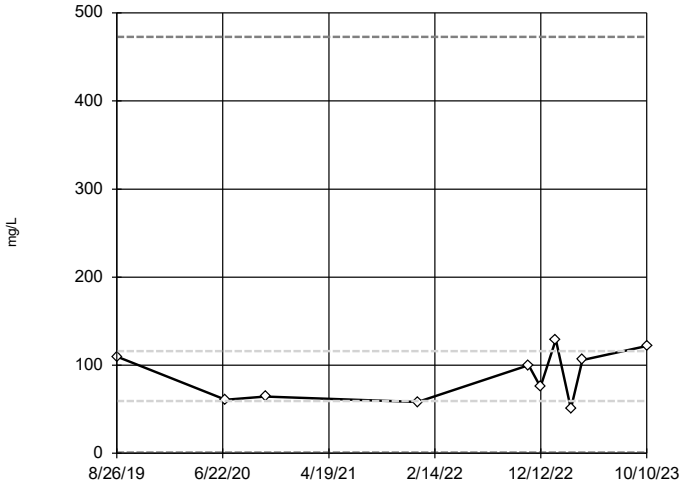
High cutoff = 252.9, low cutoff = 142.9, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-14



n = 10

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 = 472.9, low cutoff = 0.9655, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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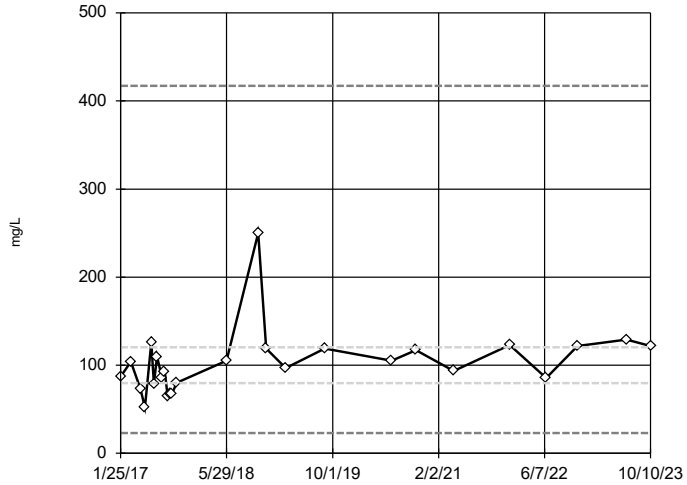
Tukey's Outlier Screening

MW-15



n = 26

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 = 417.1, low cutoff = 23.01, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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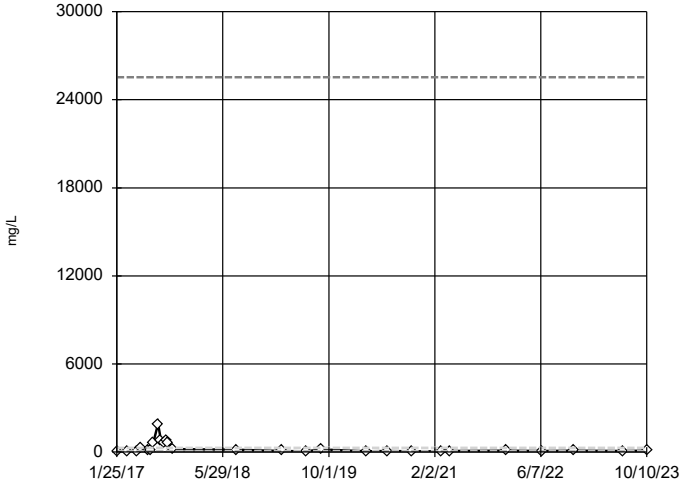
Tukey's Outlier Screening

SP-4 (bg)



n = 27

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 = 25524, low cutoff = 0.777, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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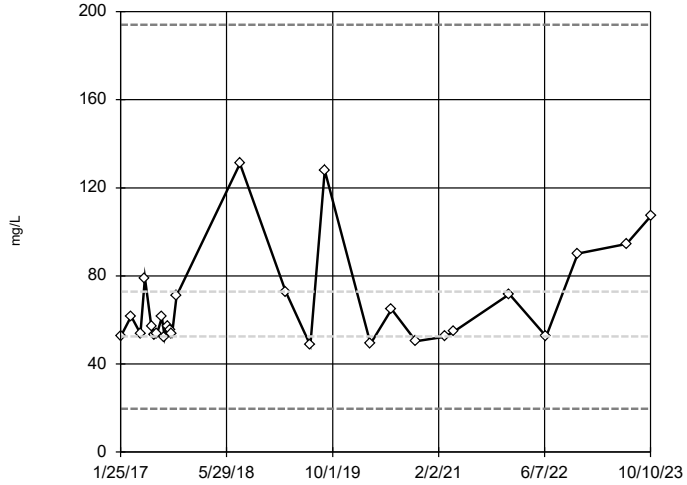
Tukey's Outlier Screening

SP-5R (bg)



n = 27

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

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

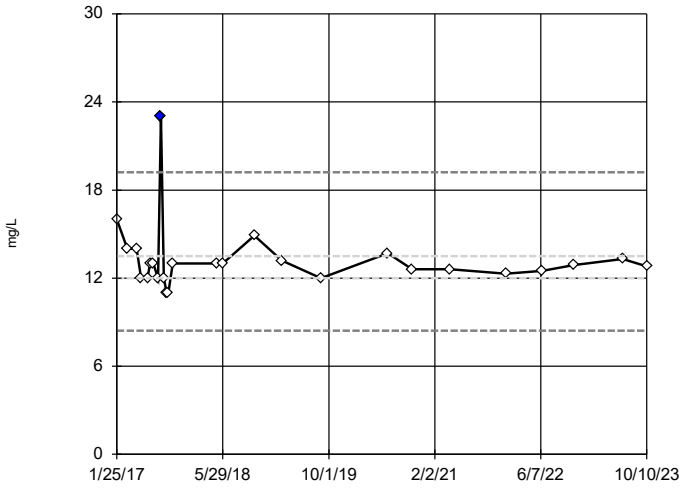
High cutoff = 194.1, low cutoff = 19.69, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-3D



n = 26

Outlier is drawn as solid. Tukey's method selected by user.

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

High cutoff = 19.21, low cutoff = 8.431, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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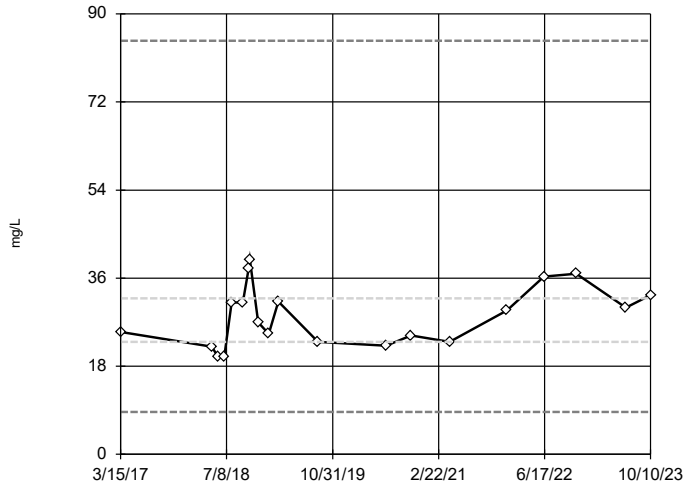
Tukey's Outlier Screening

MW-4D



n = 20

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

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

High cutoff = 84.51, low cutoff = 8.667, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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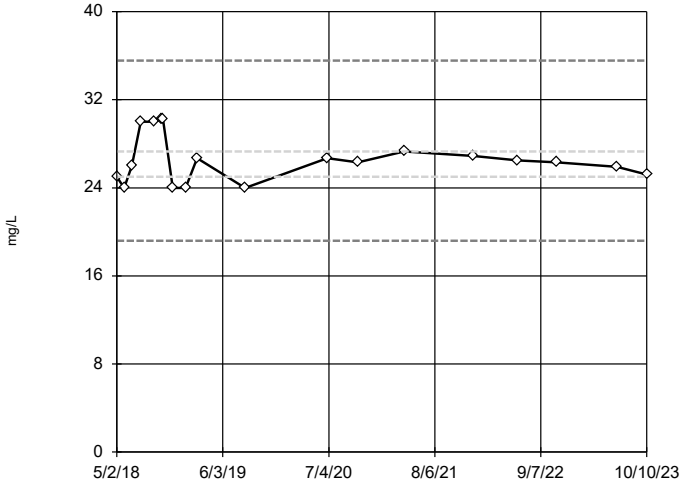
Tukey's Outlier Screening

MW-5D



n = 19

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 = 35.55, low cutoff = 19.2, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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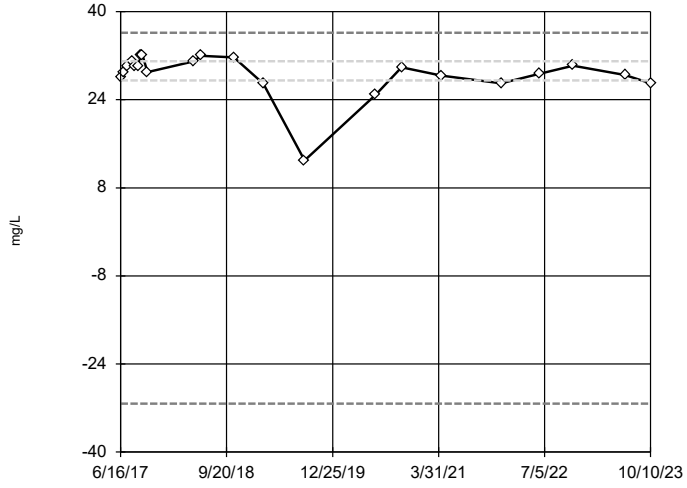
Tukey's Outlier Screening

MW-6D



n = 22

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

Data were x^6 transformed to achieve best W statistic (graph shown in original units).

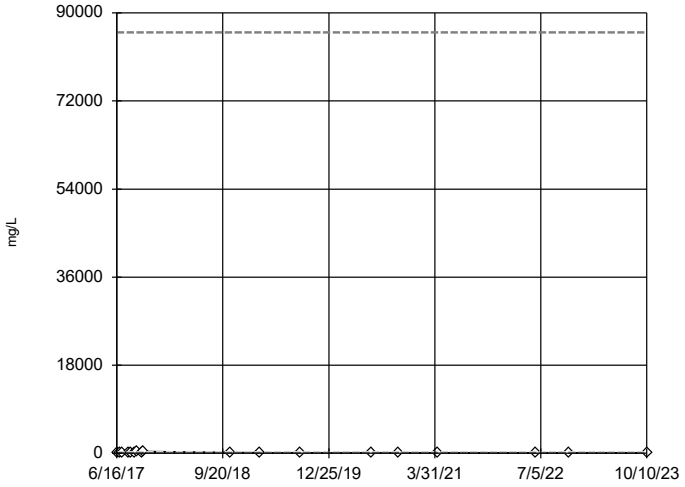
High cutoff = 36.19, low cutoff = -31.21, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-9D



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 = 86009, low cutoff = 0.05961, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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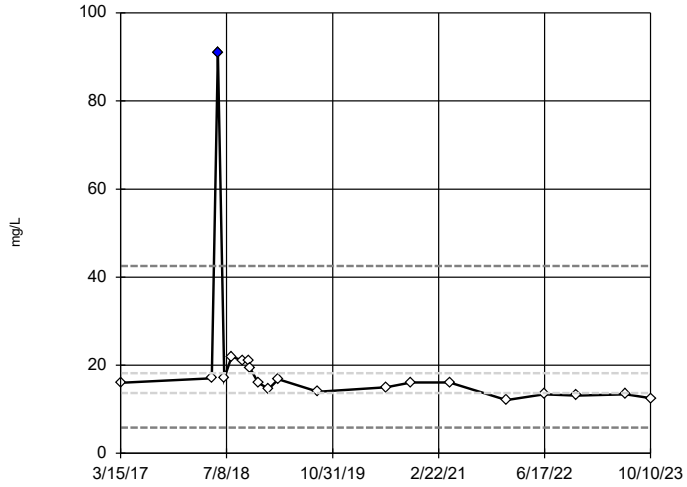
Tukey's Outlier Screening

MW-12D



n = 20

Outlier is drawn as solid. Tukey's method selected by user.

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

High cutoff = 42.51, low cutoff = 5.858, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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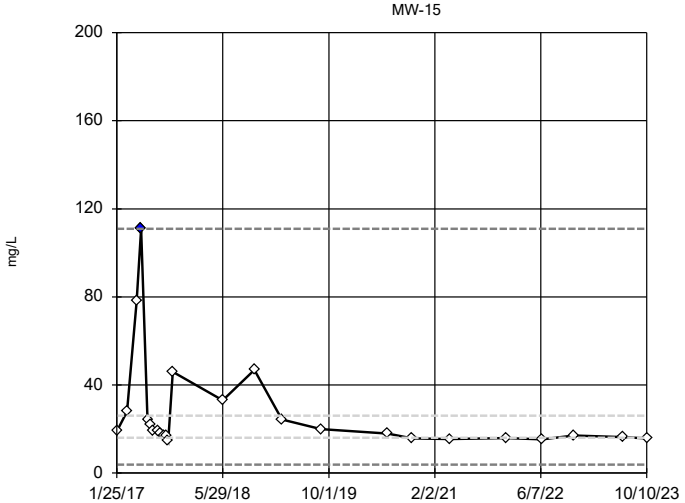
Tukey's Outlier Screening

MW-15



n = 25

Outlier is drawn as solid. Tukey's method selected by user.

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

High cutoff = 111, low cutoff = 3.785, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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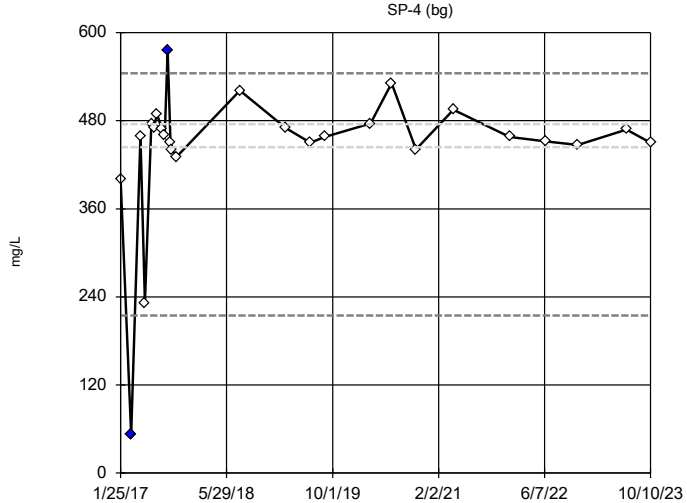
Tukey's Outlier Screening

SP-4 (bg)



n = 26

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

Data were x^4 transformed to achieve best W statistic (graph shown in original units).

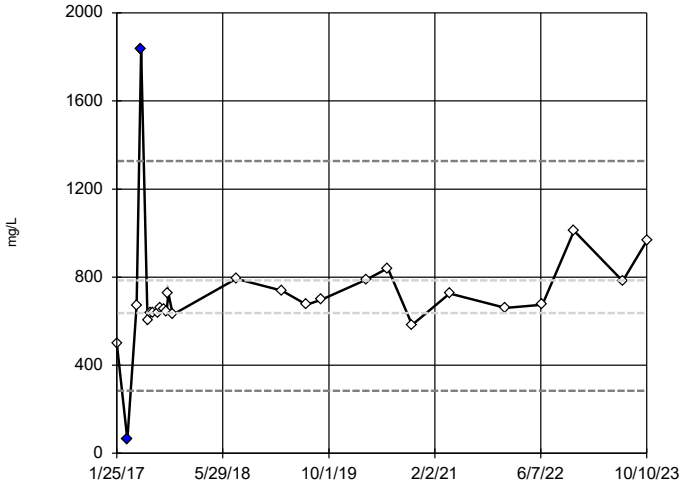
High cutoff = 544.4, low cutoff = 214.8, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

SP-5R (bg)



n = 26

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

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

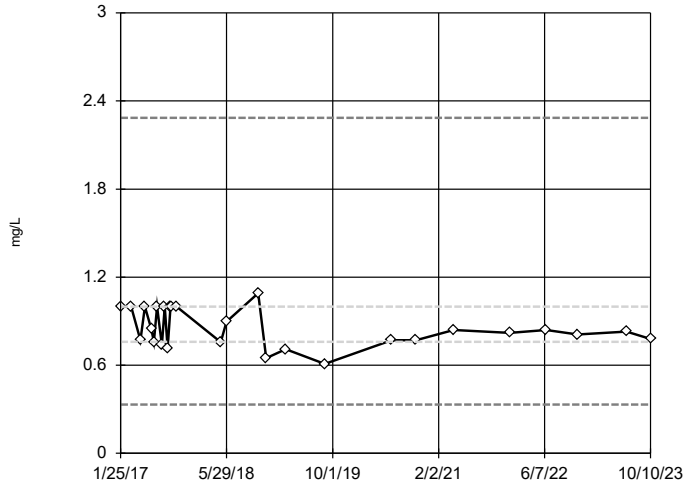
High cutoff = 1327, low cutoff = 283.9, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-3D



n = 27

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

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

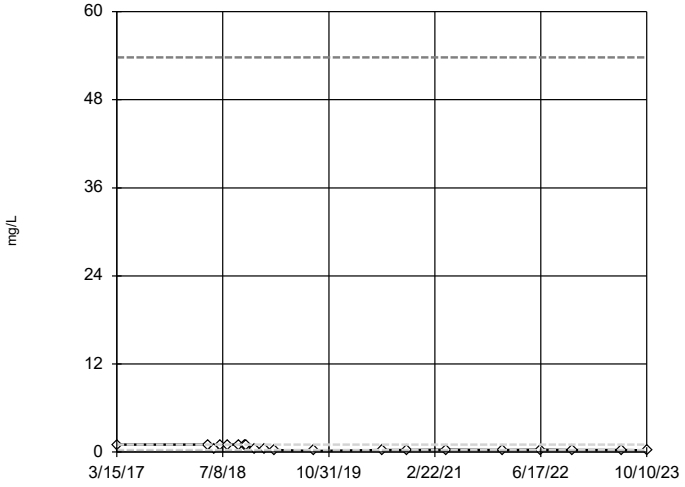
High cutoff = 2.286, low cutoff = 0.332, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-4D



n = 20

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

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

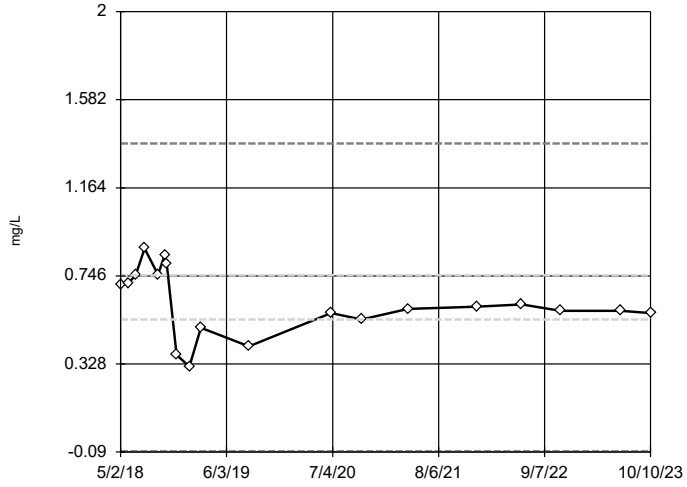
High cutoff = 53.76, low cutoff = 0.004928, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:36 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-5D



n = 19

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

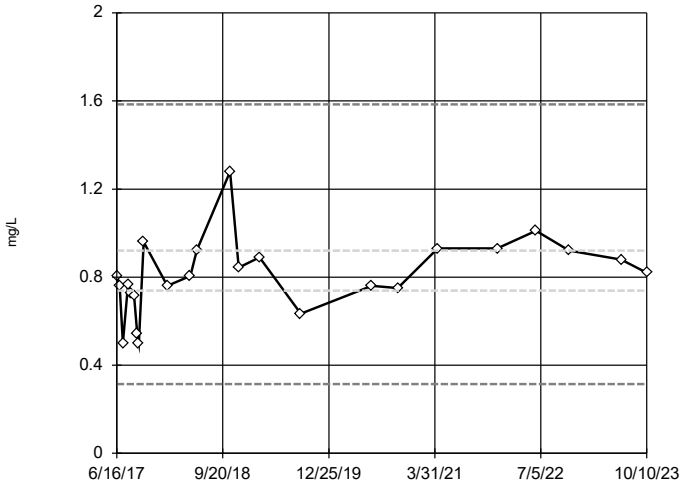
High cutoff = 1.375, low cutoff = -0.0861, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-6D



n = 24

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 = 1.585, low cutoff = 0.3145, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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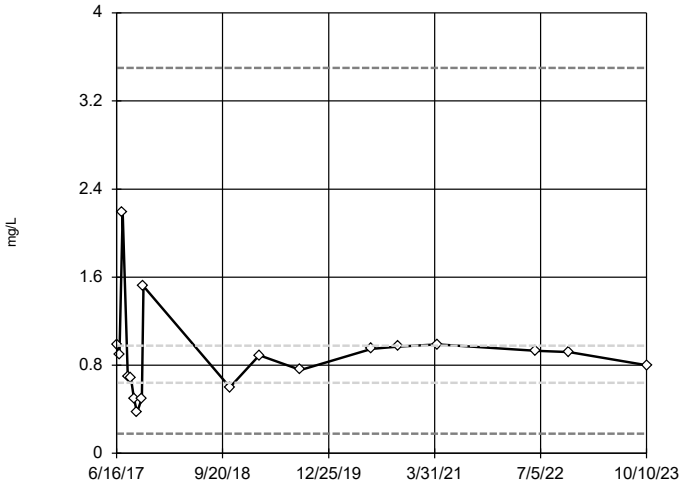
Tukey's Outlier Screening

MW-9D



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 = 3.5, low cutoff = 0.1786, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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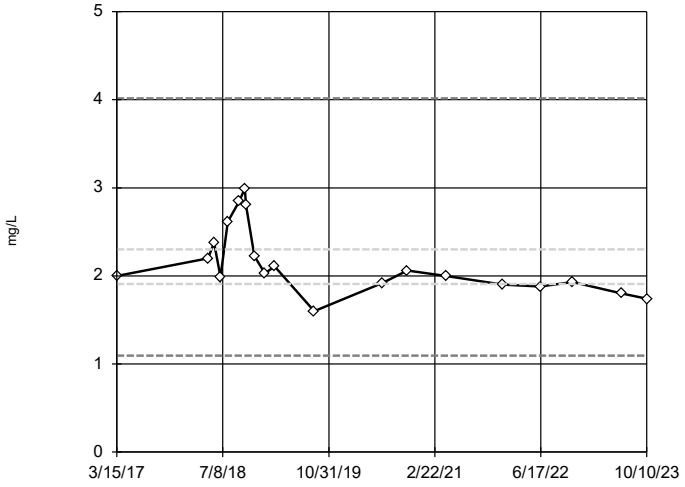
Tukey's Outlier Screening

MW-12D



n = 20

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

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

High cutoff = 4.017, low cutoff = 1.094, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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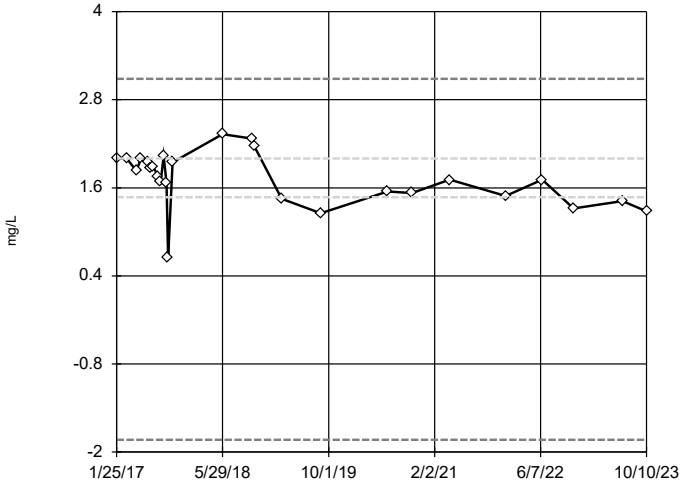
Tukey's Outlier Screening

MW-15



n = 26

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

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

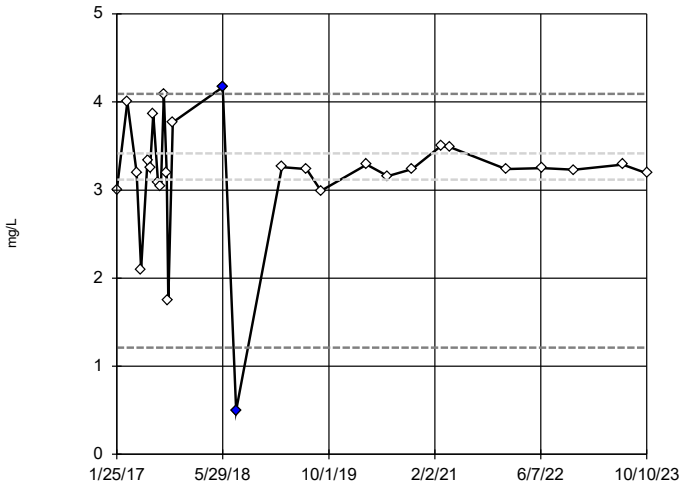
High cutoff = 3.085, low cutoff = -1.832, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

SP-4 (bg)



n = 28

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

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

High cutoff = 4.091, low cutoff = 1.212, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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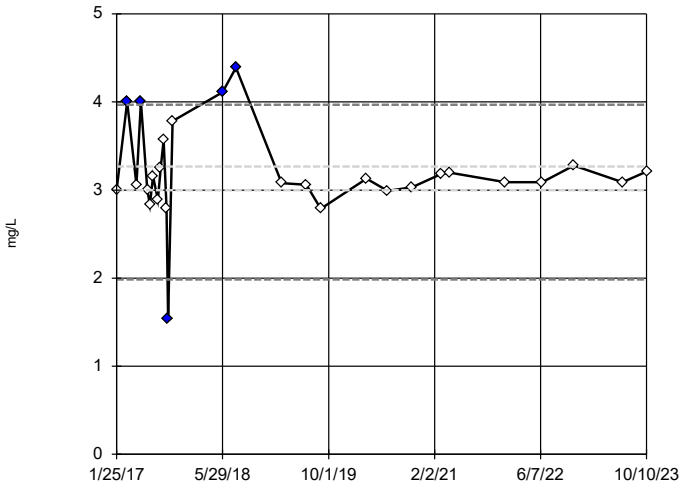
Tukey's Outlier Screening

SP-5R (bg)



n = 28

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

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

High cutoff = 3.968, low cutoff = 1.985, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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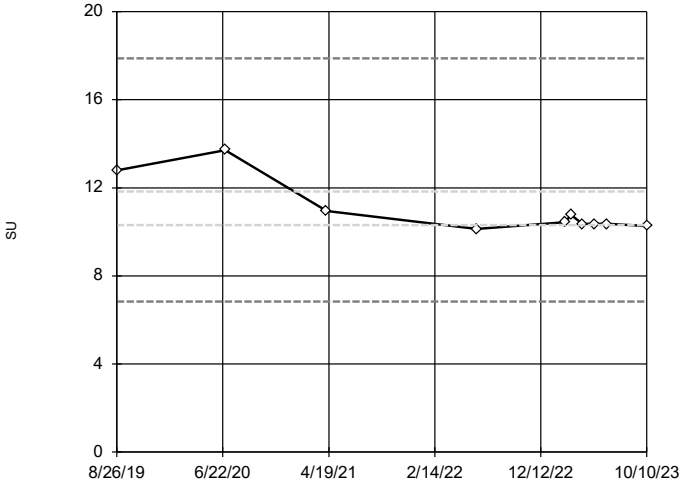
Tukey's Outlier Screening

MW-2D



n = 10

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 = 17.87, low cutoff = 6.83, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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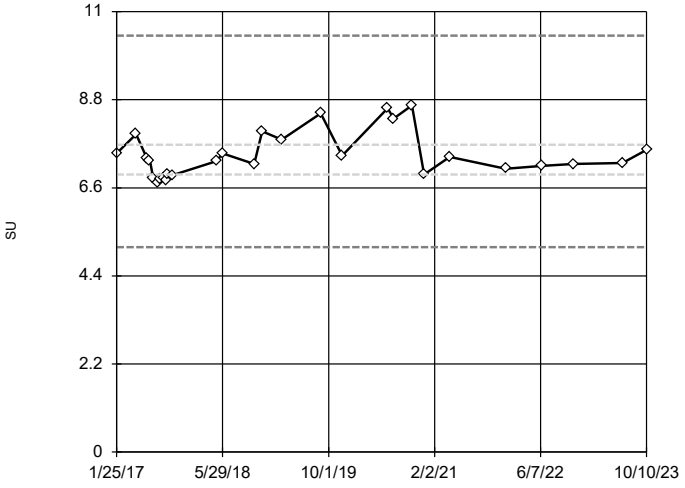
Tukey's Outlier Screening

MW-3D



n = 28

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

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

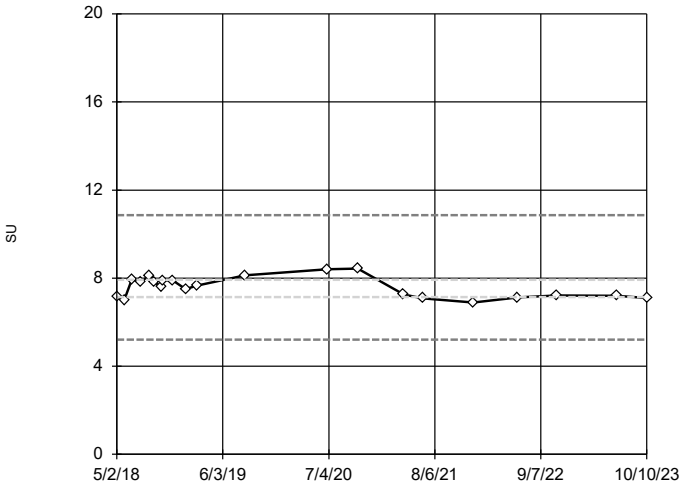
High cutoff = 10.4, low cutoff = 5.118, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-4D



n = 21

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

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

High cutoff = 10.86, low cutoff = 5.207, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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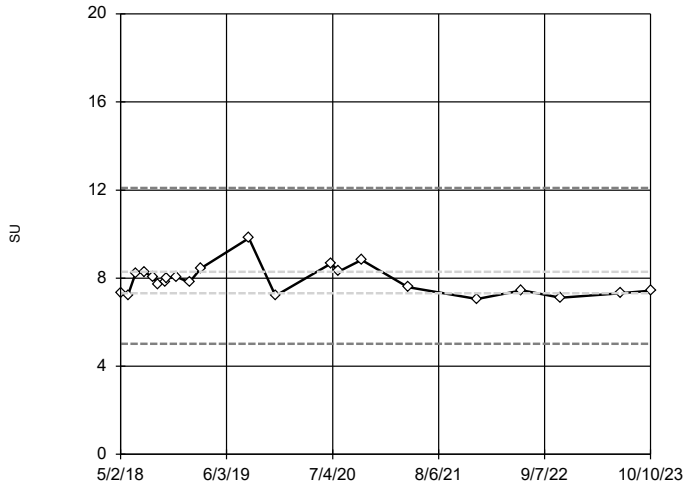
Tukey's Outlier Screening

MW-5D



n = 22

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 = 12.1, low cutoff = 5.017, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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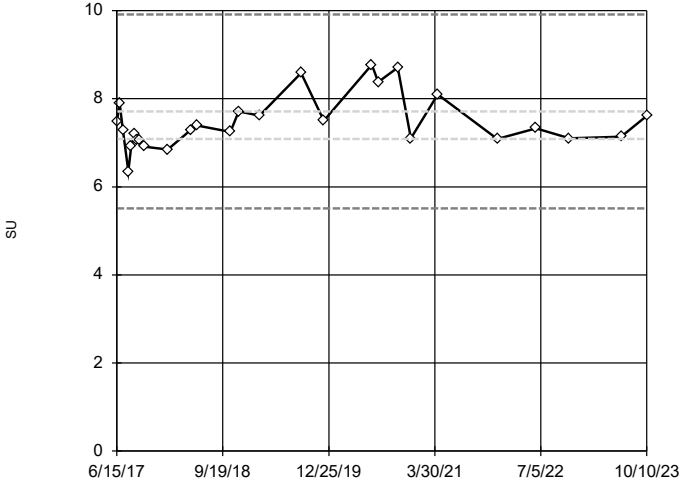
Tukey's Outlier Screening

MW-6D



n = 27

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 = 9.915, low cutoff = 5.513, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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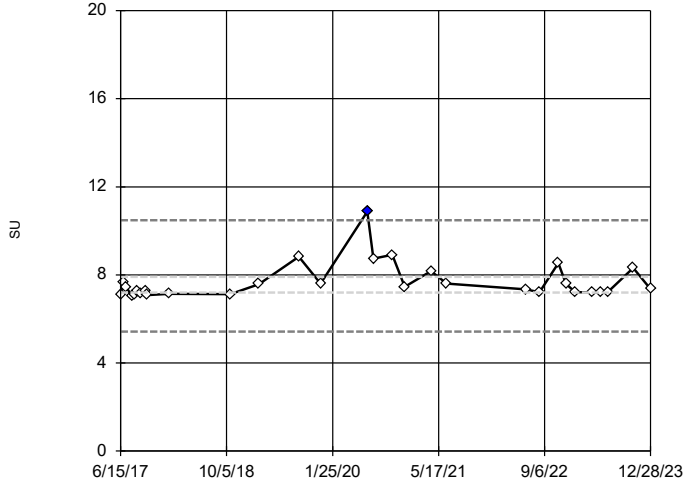
Tukey's Outlier Screening

MW-9D



n = 30

Outlier is drawn as solid. Tukey's method selected by user.

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

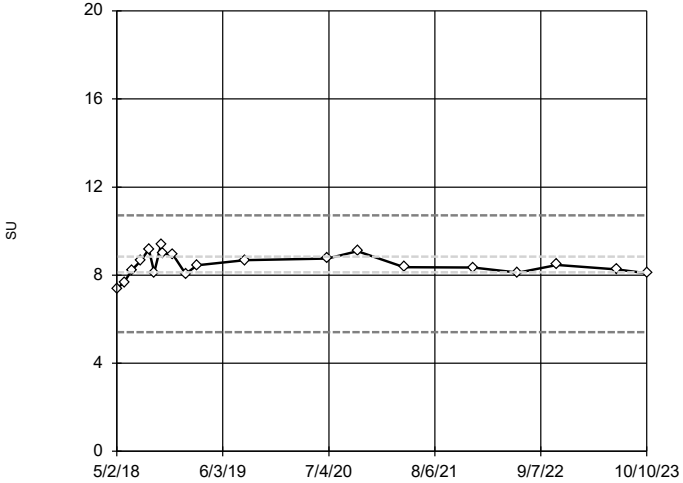
High cutoff = 10.49, low cutoff = 5.424, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-12D



n = 20

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

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

High cutoff = 10.72, low cutoff = 5.416, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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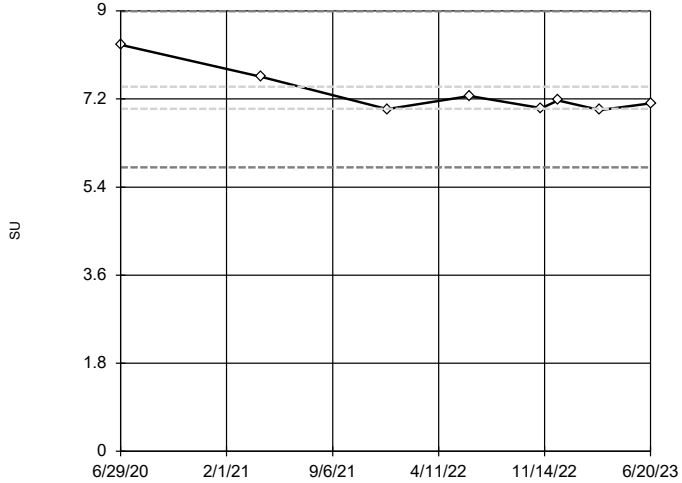
Tukey's Outlier Screening

MW-13D



n = 8

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 = 8.993, low cutoff = 5.801, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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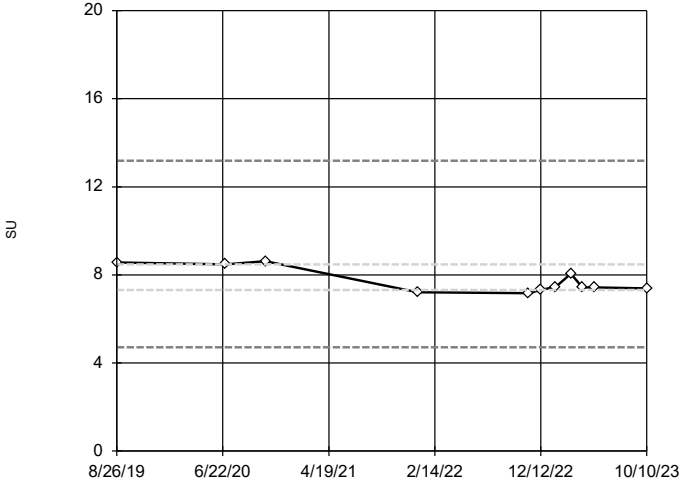
Tukey's Outlier Screening

MW-14



n = 11

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 = 13.18, low cutoff = 4.708, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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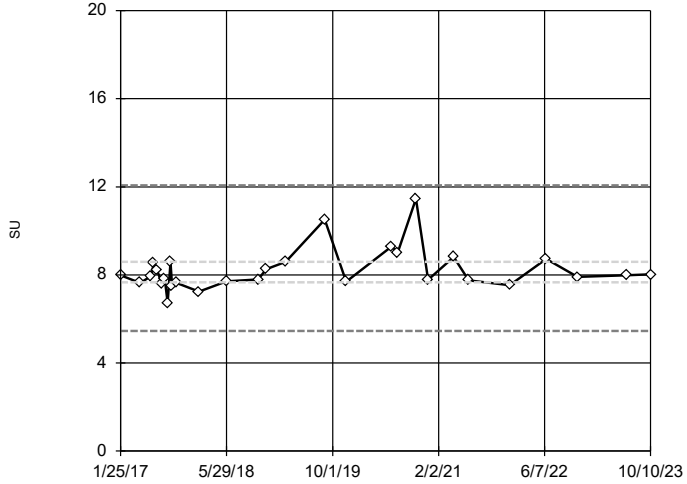
Tukey's Outlier Screening

MW-15



n = 29

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

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

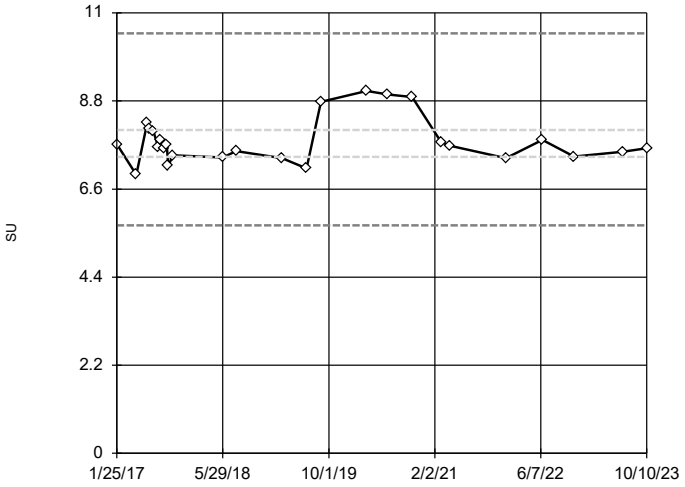
High cutoff = 12.07, low cutoff = 5.46, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

SP-4 (bg)



n = 26

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 = 10.49, low cutoff = 5.695, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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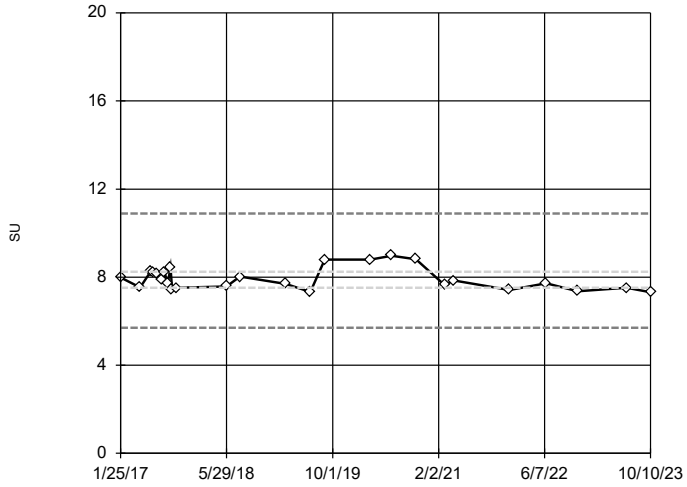
Tukey's Outlier Screening

SP-5R (bg)



n = 26

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 = 10.89, low cutoff = 5.695, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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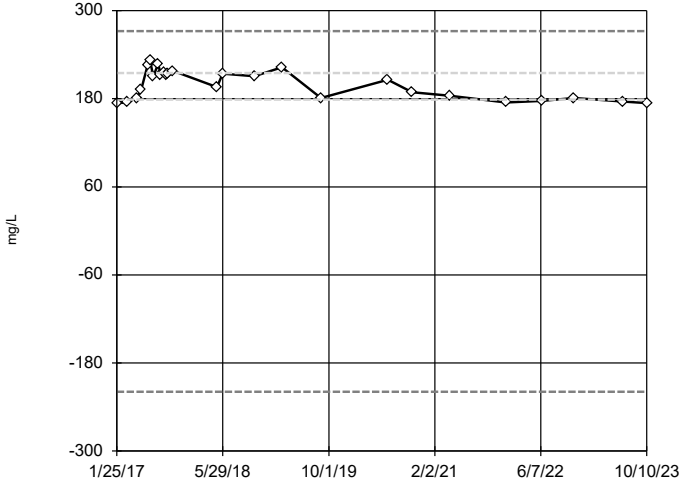
Tukey's Outlier Screening

MW-3D



n = 26

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 = 271.9, low cutoff = -219, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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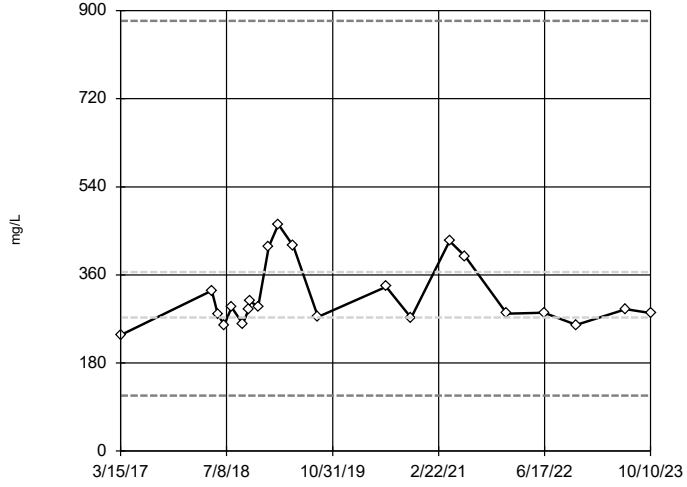
Tukey's Outlier Screening

MW-4D



n = 22

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

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

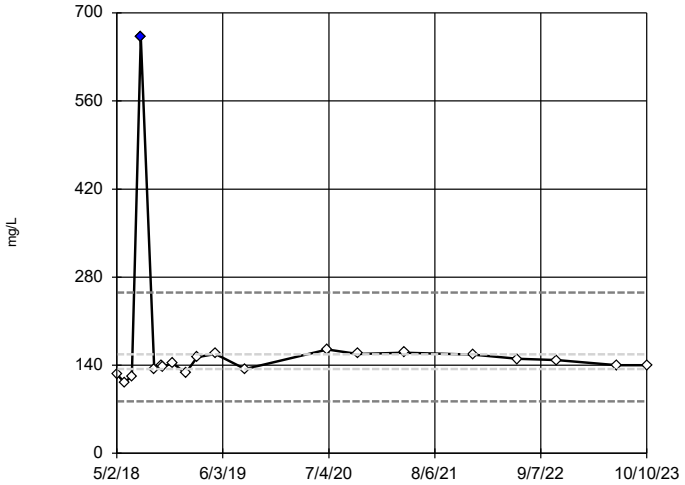
High cutoff = 879, low cutoff = 113.6, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-5D



n = 20

Outlier is drawn as solid. Tukey's method selected by user.

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

High cutoff = 255.7, low cutoff = 82.52, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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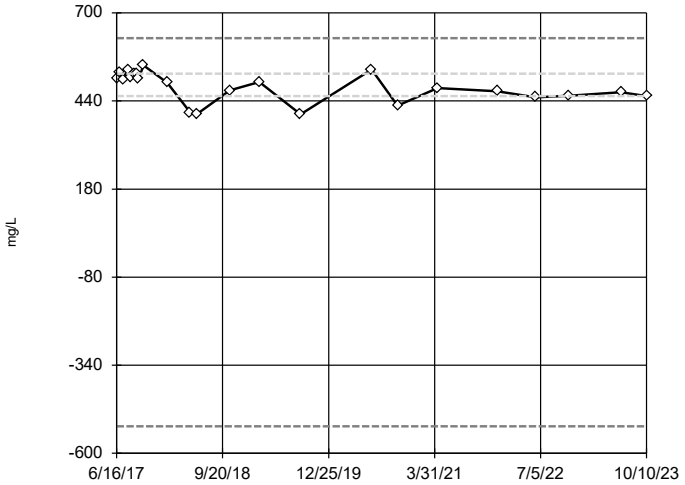
Tukey's Outlier Screening

MW-6D



n = 23

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

Data were x^5 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 625.4, low cutoff = -520, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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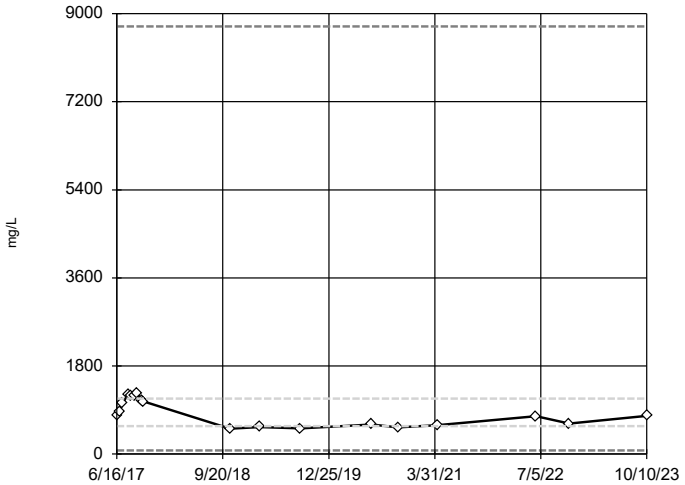
Tukey's Outlier Screening

MW-9D



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 = 8739, low cutoff = 74.51, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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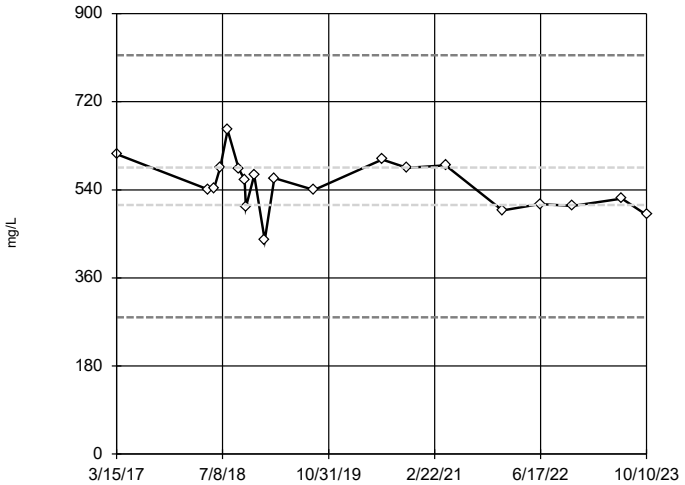
Tukey's Outlier Screening

MW-12D



n = 20

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

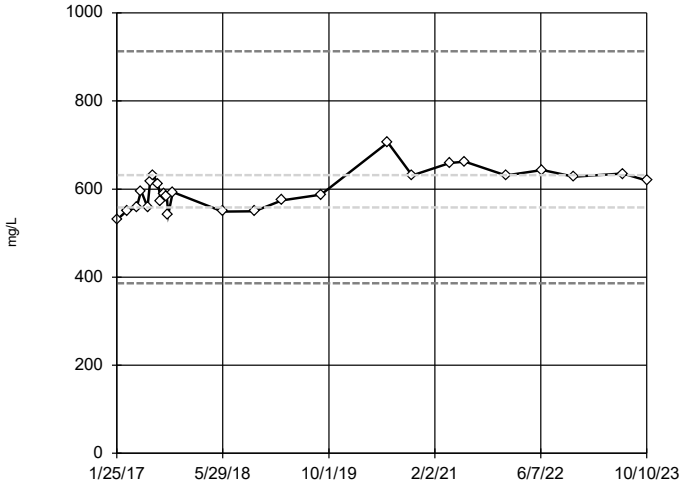
High cutoff = 815, low cutoff = 279.5, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-15



n = 26

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 = 912.9, low cutoff = 386.3, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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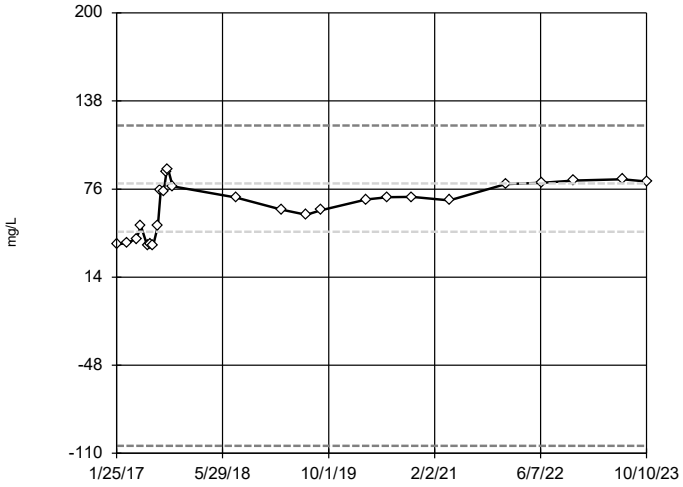
Tukey's Outlier Screening

SP-4 (bg)



n = 26

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

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

High cutoff = 120.7, low cutoff = -104.7, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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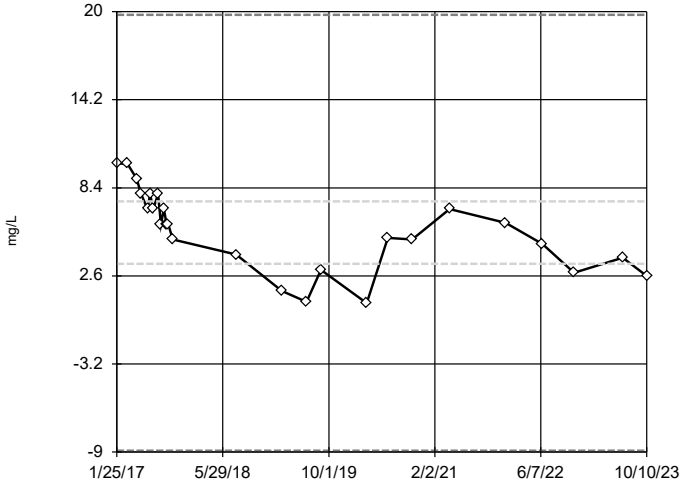
Tukey's Outlier Screening

SP-5R (bg)



n = 26

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

High cutoff = 19.8, low cutoff = -8.9, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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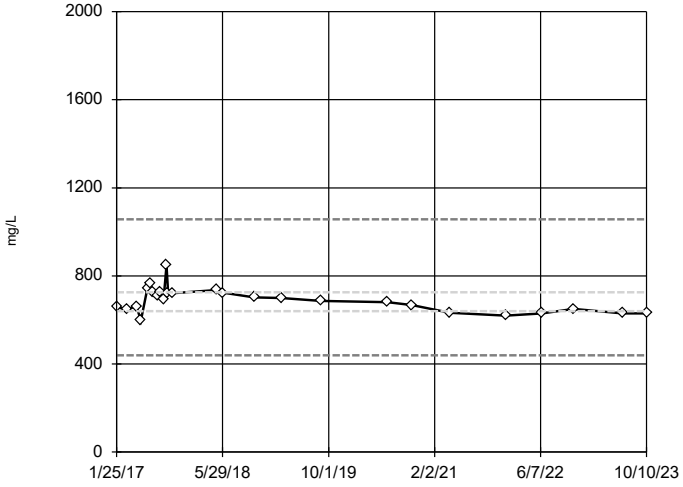
Tukey's Outlier Screening

MW-3D



n = 26

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

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

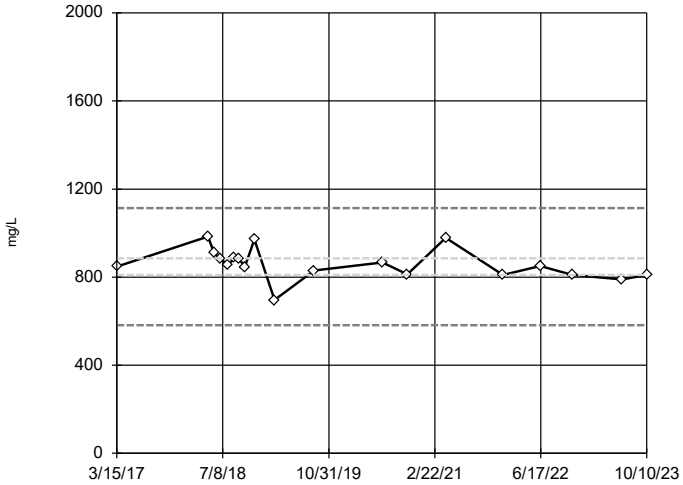
High cutoff = 1057, low cutoff = 439.7, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-4D



n = 19

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

Ladder of Powers transformations did not improve normality; analysis run on raw data.

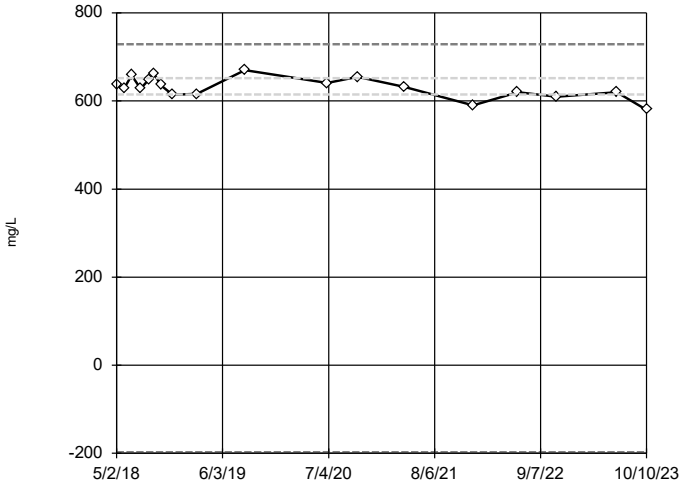
High cutoff = 1114, low cutoff = 582, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-5D



n = 18

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

Data were x^5 transformed to achieve best W statistic (graph shown in original units).

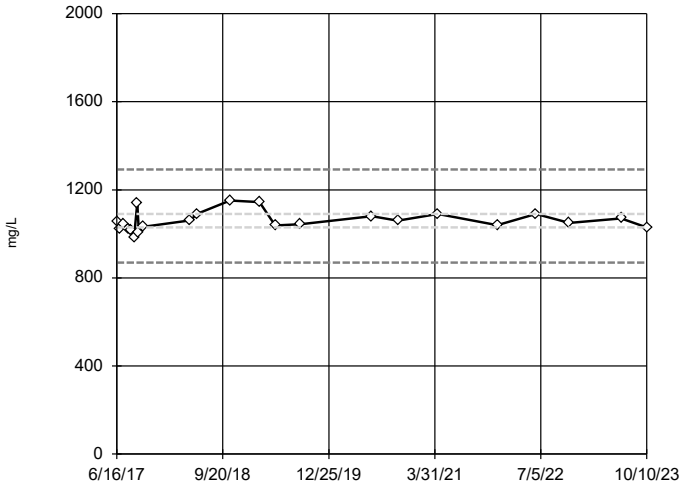
High cutoff = 728.9, low cutoff = -197.6, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-6D



n = 23

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

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

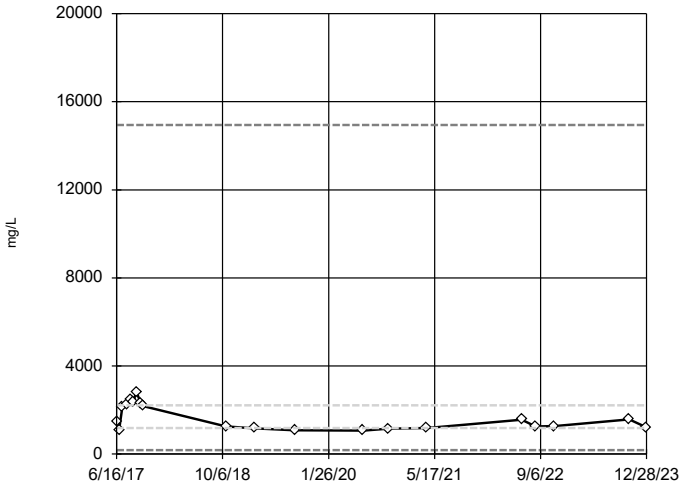
High cutoff = 1292, low cutoff = 869.1, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-9D



n = 20

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

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

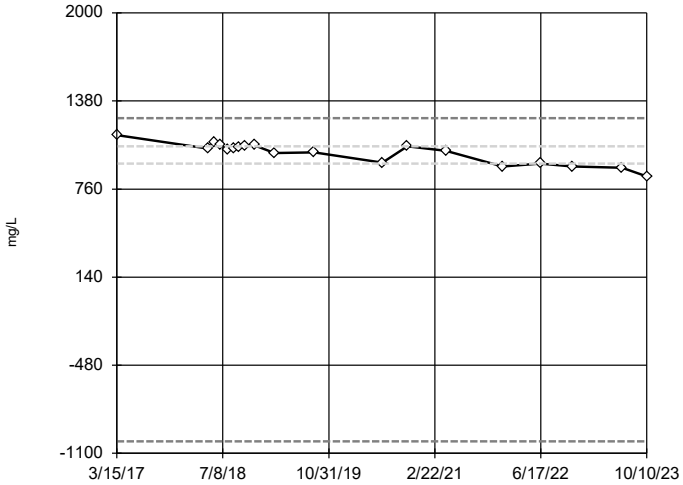
High cutoff = 14943, low cutoff = 175, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening

MW-12D



n = 19

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

Data were x^5 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1258, low cutoff = -1015, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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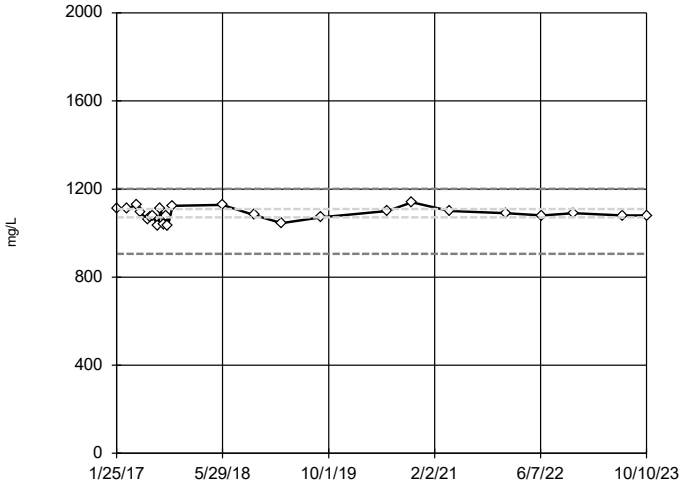
Tukey's Outlier Screening

MW-15



n = 25

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

Data were x^5 transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1200, low cutoff = 905.2, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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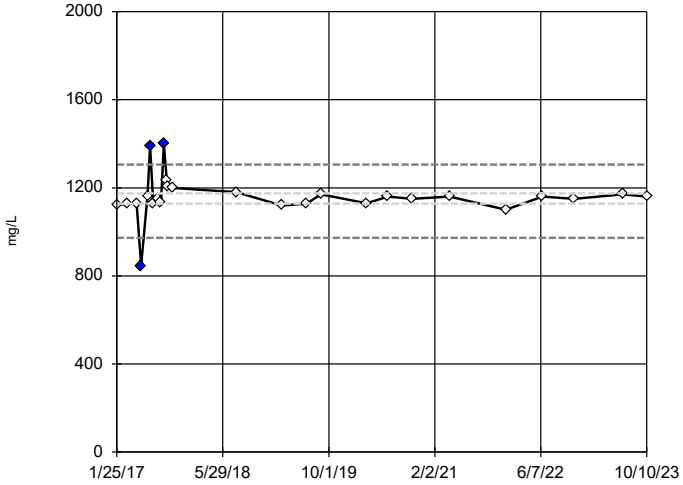
Tukey's Outlier Screening

SP-4 (bg)



n = 26

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

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

High cutoff = 1306, low cutoff = 973.4, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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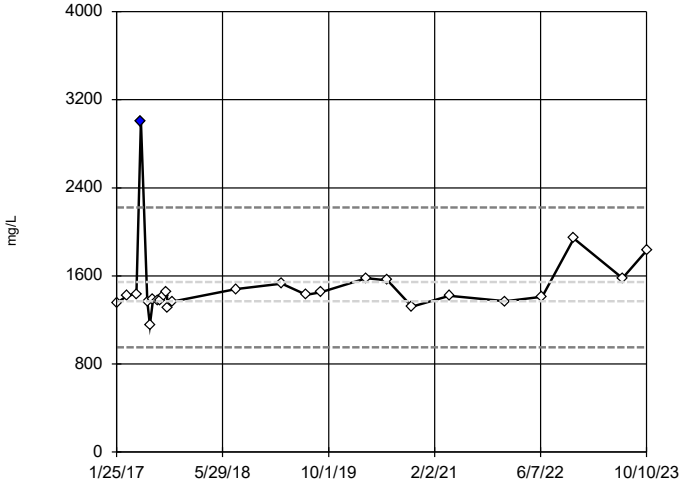
Tukey's Outlier Screening

SP-5R (bg)



n = 26

Outlier is drawn as solid.
Tukey's method selected by user.

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

High cutoff = 2220, low cutoff = 952.6, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/25/2024 5:37 PM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE D

Rank Von Neumann – 2017

Rank Von Neumann - 2017 - Significant Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 4:31 PM

Constituent	Well	N	R(V)	Alpha	Table	Sig.
Calcium (mg/L)	**SP-4 (bg)**	**12**	**0.8042**	**0.010**	**0.81**	**Yes**
Chloride (mg/L)	**MW-3D**	**12**	**0.7972**	**0.010**	**0.81**	**Yes**
Chloride (mg/L)	**MW-15**	**13**	**0.8269**	**0.010**	**0.84**	**Yes**
pH, field (SU)	**MW-3D**	**11**	**0.6**	**0.010**	**0.77**	**Yes**
Sulfate (mg/L)	**SP-4 (bg)**	**13**	**0.5865**	**0.010**	**0.84**	**Yes**
Sulfate (mg/L)	**SP-5R (bg)**	**13**	**0.5508**	**0.010**	**0.84**	**Yes**

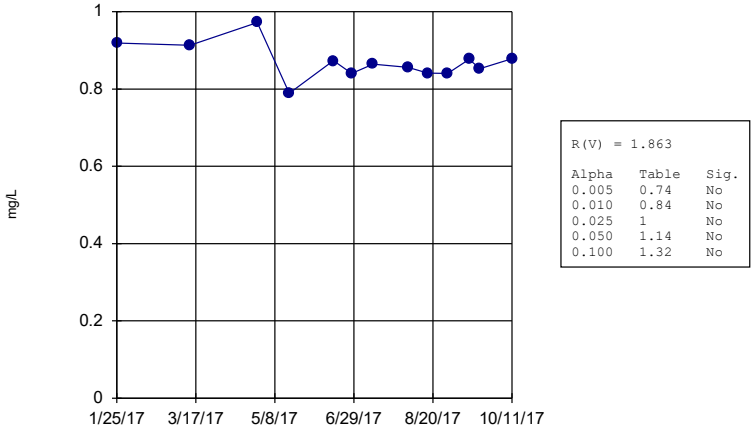
Rank Von Neumann - 2017 - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 4:31 PM

Constituent	Well	N	R(V)	Alpha	Table	Sig.
Boron (mg/L)	MW-3D	13	1.863	0.010	0.84	No
Boron (mg/L)	MW-6D	9	1.583	0.010	0.67	No
Boron (mg/L)	MW-9D	9	1.083	0.010	0.67	No
Boron (mg/L)	MW-15	13	1.115	0.010	0.84	No
Boron (mg/L)	SP-4 (bg)	13	2.033	0.010	0.84	No
Boron (mg/L)	SP-5R (bg)	13	1.742	0.010	0.84	No
Calcium (mg/L)	MW-3D	13	1.687	0.010	0.84	No
Calcium (mg/L)	MW-6D	9	1.733	0.010	0.67	No
Calcium (mg/L)	MW-15	13	2.143	0.010	0.84	No
Calcium (mg/L)	**SP-4 (bg)**	**12**	**0.8042**	**0.010**	**0.81**	**Yes**
Calcium (mg/L)	SP-5R (bg)	13	2.56	0.010	0.84	No
Chloride (mg/L)	**MW-3D**	**12**	**0.7972**	**0.010**	**0.81**	**Yes**
Chloride (mg/L)	MW-6D	9	1.079	0.010	0.67	No
Chloride (mg/L)	MW-9D	4	1.2	0.100	0.6	No
Chloride (mg/L)	**MW-15**	**13**	**0.8269**	**0.010**	**0.84**	**Yes**
Chloride (mg/L)	SP-4 (bg)	12	1.49	0.010	0.81	No
Chloride (mg/L)	SP-5R (bg)	11	2.291	0.010	0.77	No
Fluoride (mg/L)	MW-3D	13	2.11	0.010	0.84	No
Fluoride (mg/L)	MW-6D	9	1.683	0.010	0.67	No
Fluoride (mg/L)	MW-9D	9	2.433	0.010	0.67	No
Fluoride (mg/L)	MW-15	13	2.016	0.010	0.84	No
Fluoride (mg/L)	SP-4 (bg)	13	2.544	0.010	0.84	No
Fluoride (mg/L)	SP-5R (bg)	13	2.18	0.010	0.84	No
pH, field (SU)	**MW-3D**	**11**	**0.6**	**0.010**	**0.77**	**Yes**
pH, field (SU)	MW-6D	9	1.029	0.010	0.67	No
pH, field (SU)	MW-9D	9	1.933	0.010	0.67	No
pH, field (SU)	MW-15	11	2.598	0.010	0.77	No
pH, field (SU)	SP-4 (bg)	11	1.818	0.010	0.77	No
pH, field (SU)	SP-5R (bg)	11	2.2	0.010	0.77	No
Sulfate (mg/L)	MW-3D	13	1.181	0.010	0.84	No
Sulfate (mg/L)	MW-6D	9	3	0.010	0.67	No
Sulfate (mg/L)	MW-15	13	1.231	0.010	0.84	No
Sulfate (mg/L)	**SP-4 (bg)**	**13**	**0.5865**	**0.010**	**0.84**	**Yes**
Sulfate (mg/L)	**SP-5R (bg)**	**13**	**0.5508**	**0.010**	**0.84**	**Yes**
Total Dissolved Solids [TDS] (m...	MW-3D	13	1.407	0.010	0.84	No
Total Dissolved Solids [TDS] (m...	MW-6D	9	2.6	0.010	0.67	No
Total Dissolved Solids [TDS] (m...	MW-15	13	1.857	0.010	0.84	No
Total Dissolved Solids [TDS] (m...	SP-4 (bg)	13	1.137	0.010	0.84	No
Total Dissolved Solids [TDS] (m...	SP-5R (bg)	12	1.872	0.010	0.81	No

Rank Von Neumann

MW-3D



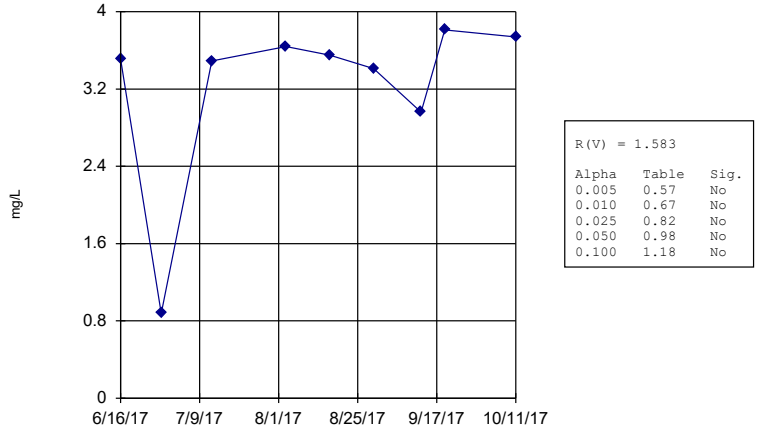
R(V) = 1.863

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Boron Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-6D



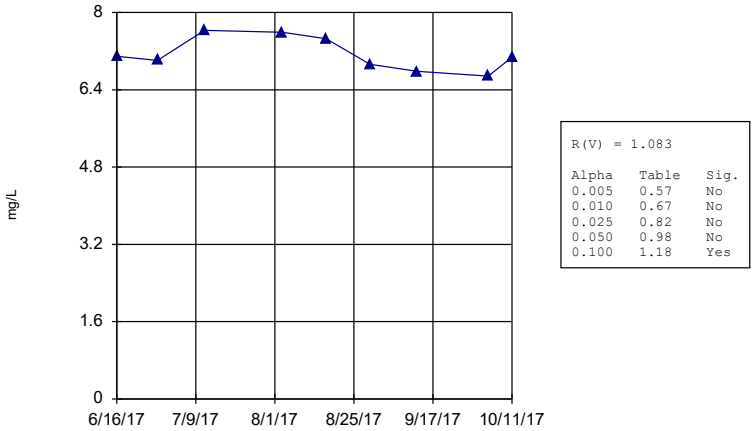
R(V) = 1.583

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: Boron Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-9D



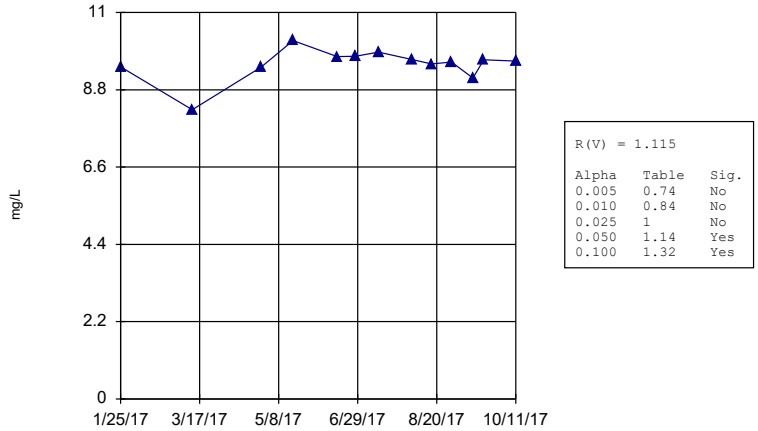
R(V) = 1.083

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	Yes

Constituent: Boron Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-15



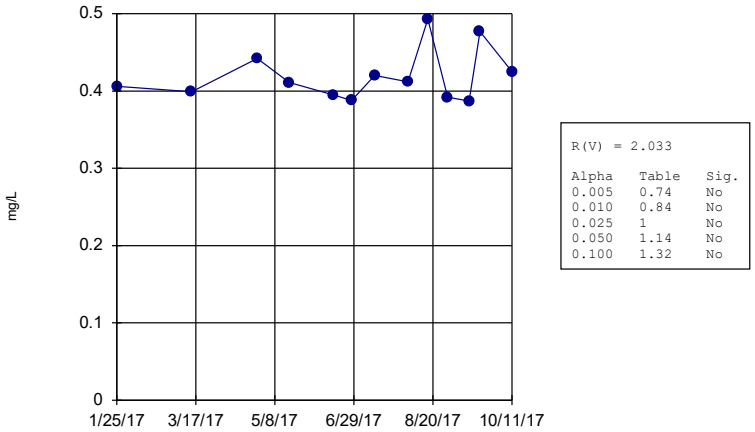
R(V) = 1.115

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	Yes
0.100	1.32	Yes

Constituent: Boron Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-4 (bg)



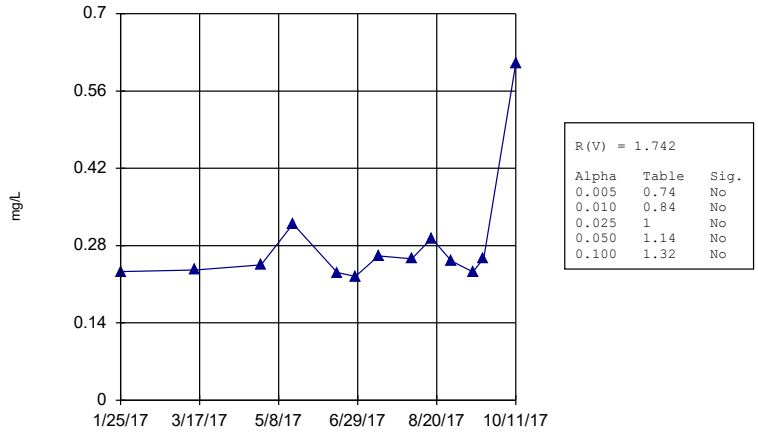
R(V) = 2.033

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Boron Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-5R (bg)



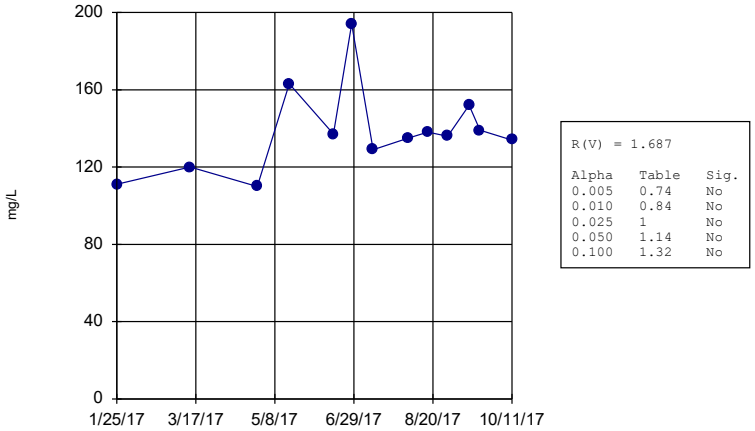
R(V) = 1.742

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Boron Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-3D



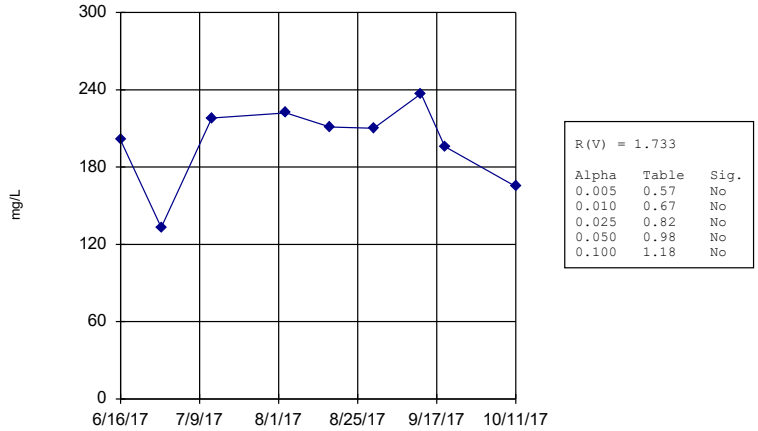
R(V) = 1.687

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Calcium Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-6D



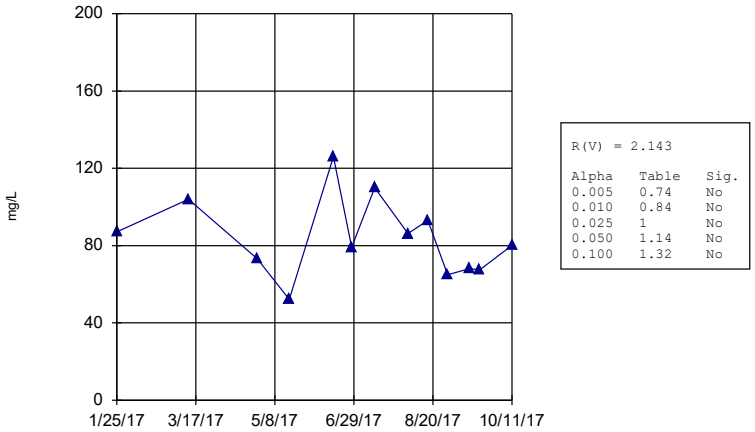
R(V) = 1.733

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: Calcium Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-15



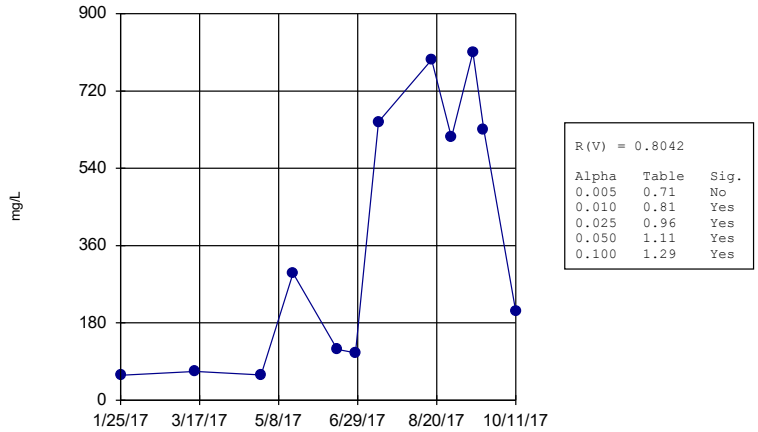
R(V) = 2.143

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Calcium Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-4 (bg)



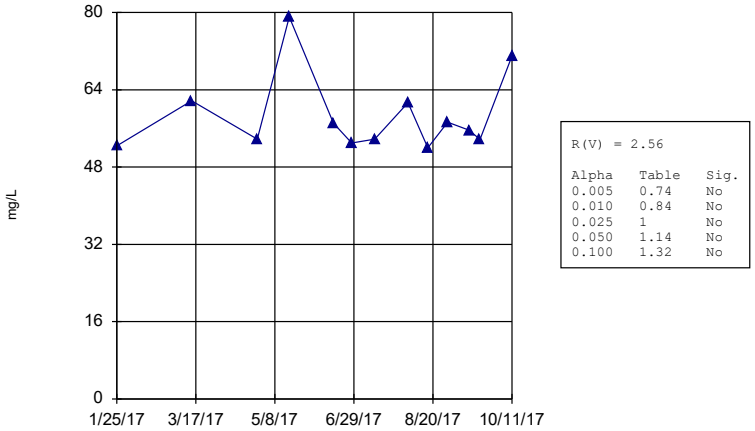
R(V) = 0.8042

Alpha	Table	Sig.
0.005	0.71	No
0.010	0.81	Yes
0.025	0.96	Yes
0.050	1.11	Yes
0.100	1.29	Yes

Constituent: Calcium Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-5R (bg)



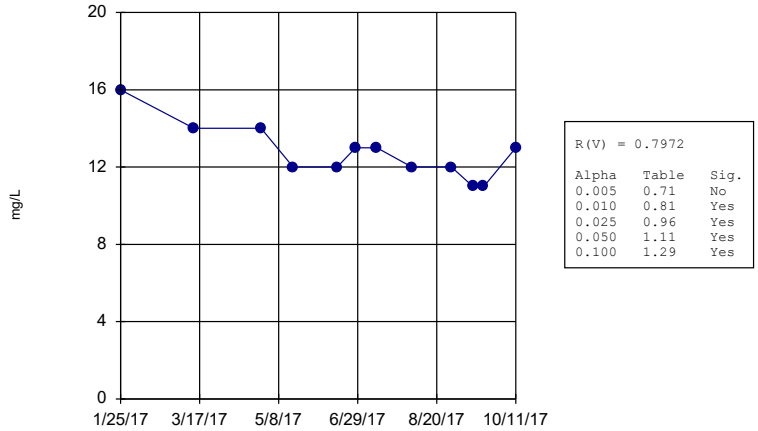
R(V) = 2.56

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Calcium Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-3D



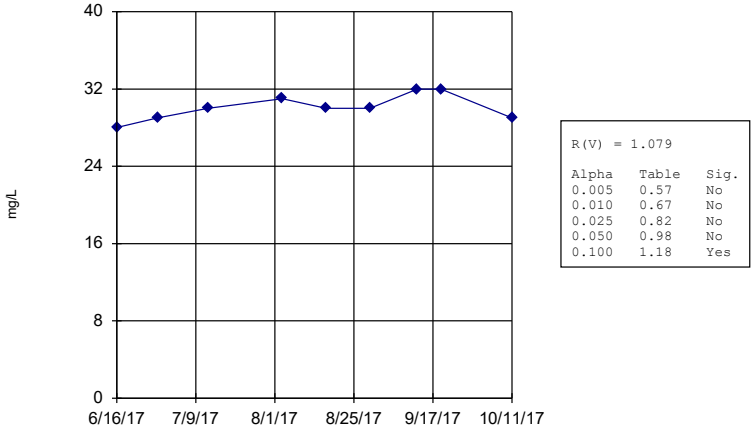
R(V) = 0.7972

Alpha	Table	Sig.
0.005	0.71	No
0.010	0.81	Yes
0.025	0.96	Yes
0.050	1.11	Yes
0.100	1.29	Yes

Constituent: Chloride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-6D



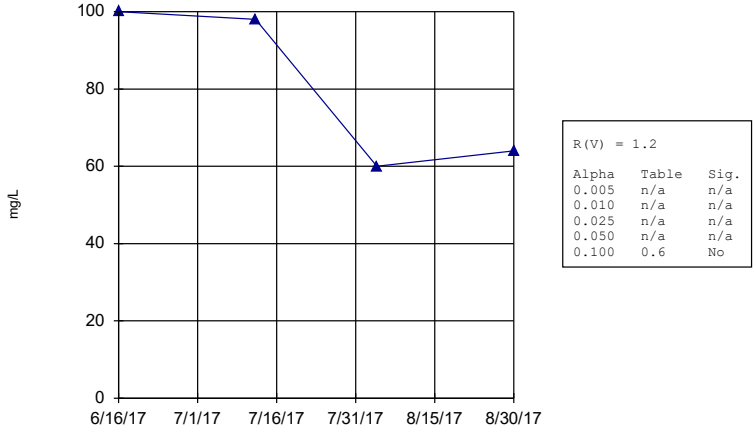
R(V) = 1.079

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	Yes

Constituent: Chloride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-9D



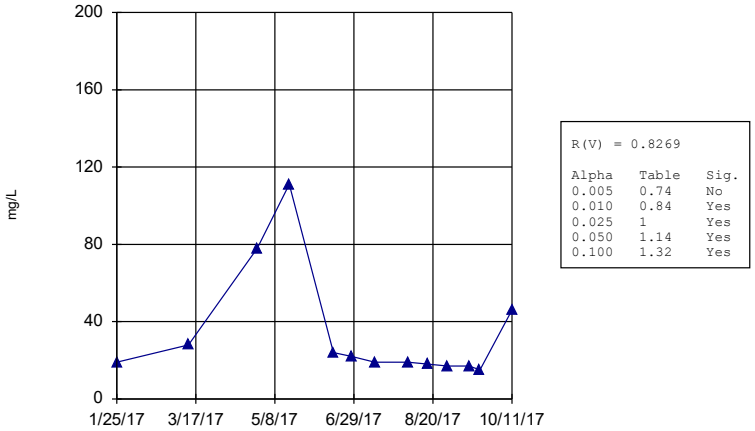
R(V) = 1.2

Alpha	Table	Sig.
0.005	n/a	n/a
0.010	n/a	n/a
0.025	n/a	n/a
0.050	n/a	n/a
0.100	0.6	No

Constituent: Chloride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-15



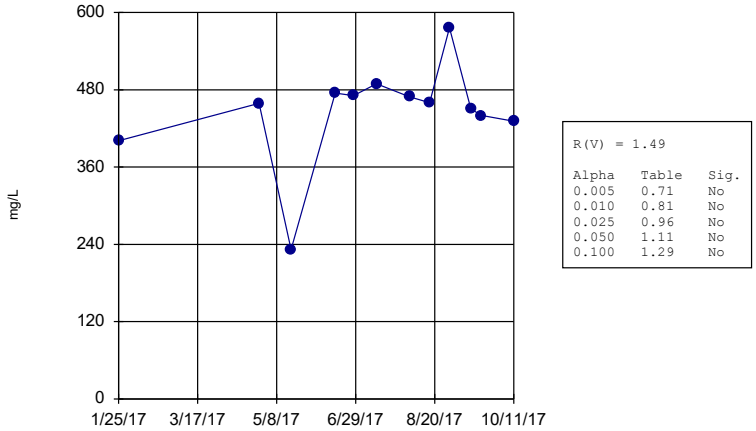
R(V) = 0.8269

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	Yes
0.025	1	Yes
0.050	1.14	Yes
0.100	1.32	Yes

Constituent: Chloride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-4 (bg)



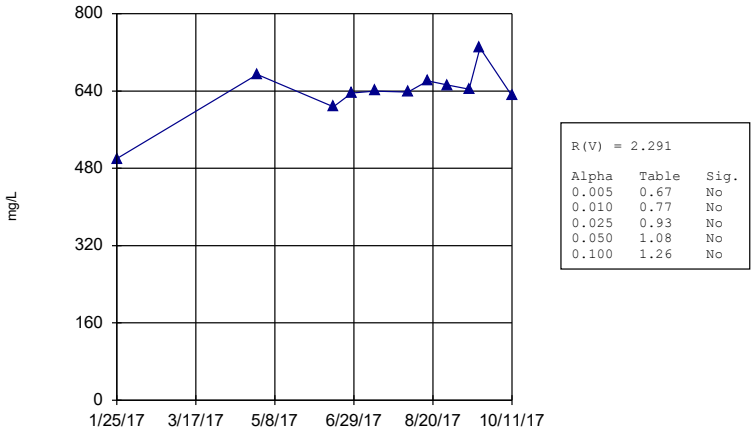
R(V) = 1.49

Alpha	Table	Sig.
0.005	0.71	No
0.010	0.81	No
0.025	0.96	No
0.050	1.11	No
0.100	1.29	No

Constituent: Chloride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-5R (bg)



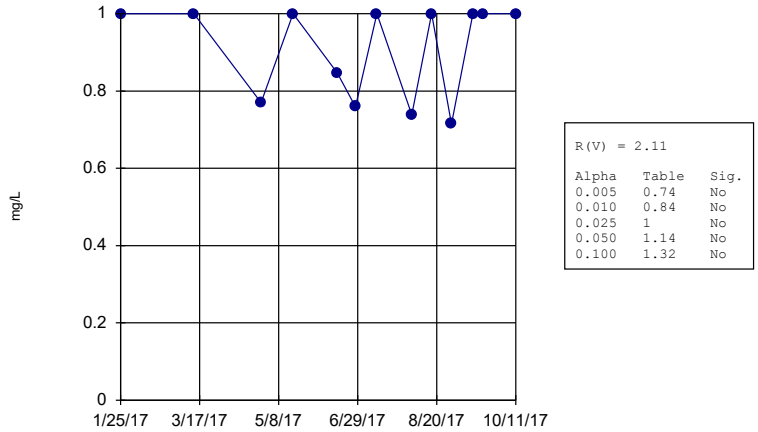
R(V) = 2.291

Alpha	Table	Sig.
0.005	0.67	No
0.010	0.77	No
0.025	0.93	No
0.050	1.08	No
0.100	1.26	No

Constituent: Chloride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-3D



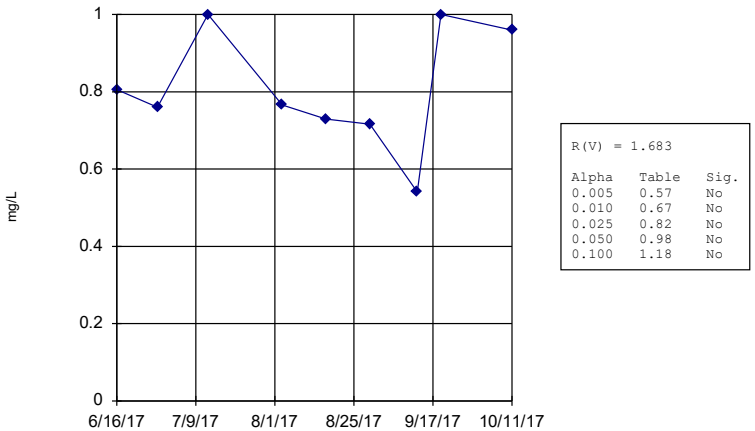
R(V) = 2.11

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Fluoride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-6D



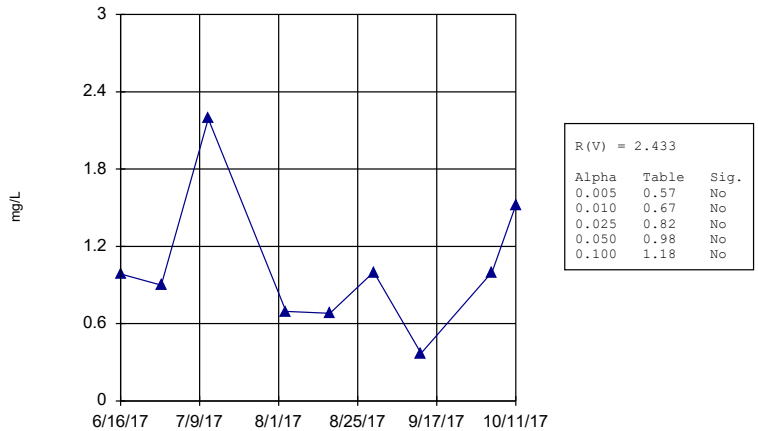
R(V) = 1.683

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: Fluoride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-9D



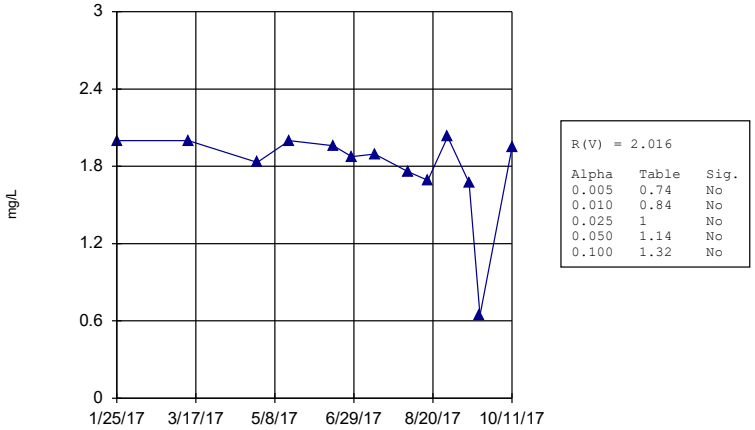
R(V) = 2.433

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: Fluoride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-15



R(V) = 2.016

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Fluoride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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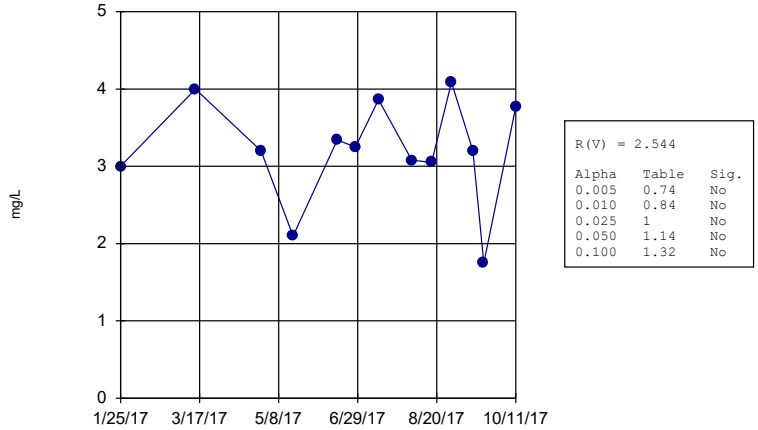
Rank Von Neumann

SP-4 (bg)



R(V) = 2.544

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Fluoride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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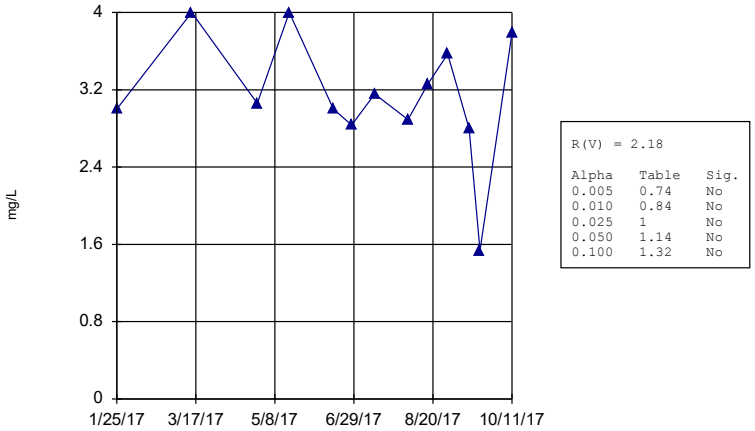
Rank Von Neumann

SP-5R (bg)



R(V) = 2.18

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Fluoride Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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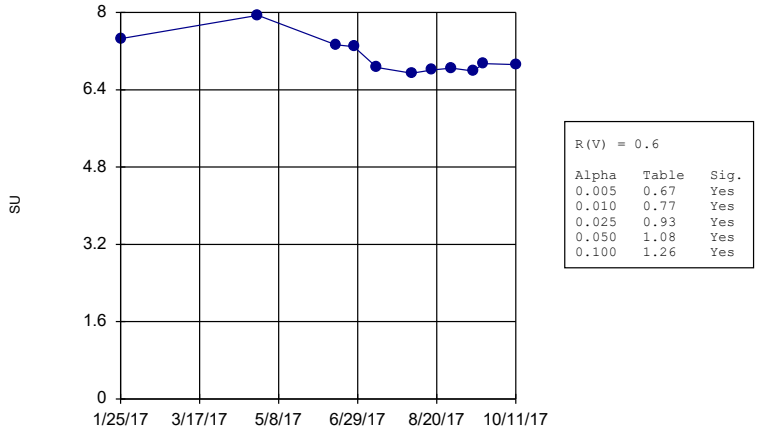
Rank Von Neumann

MW-3D



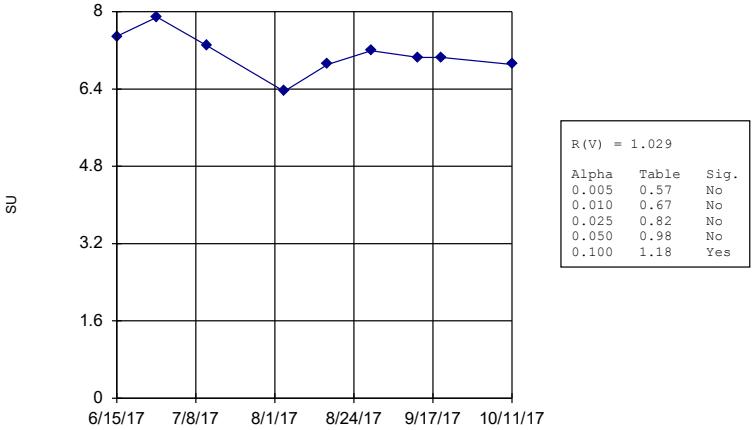
R(V) = 0.6

Alpha	Table	Sig.
0.005	0.67	Yes
0.010	0.77	Yes
0.025	0.93	Yes
0.050	1.08	Yes
0.100	1.26	Yes

Constituent: pH, field Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-6D



R(V) = 1.029

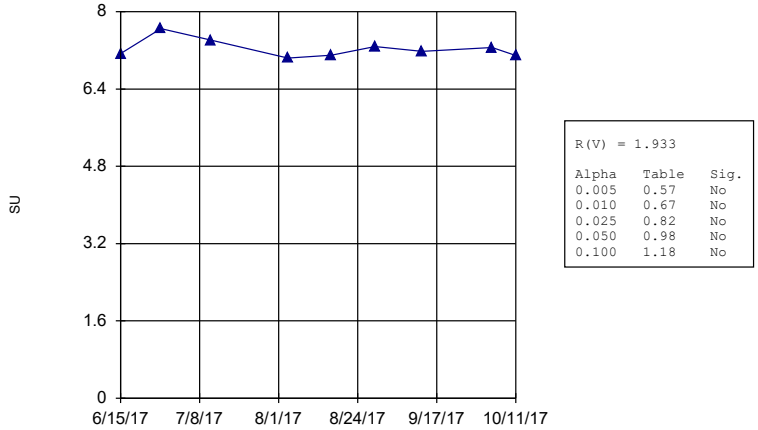
Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	Yes

Constituent: pH, field Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Rank Von Neumann

MW-9D



R(V) = 1.933

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: pH, field Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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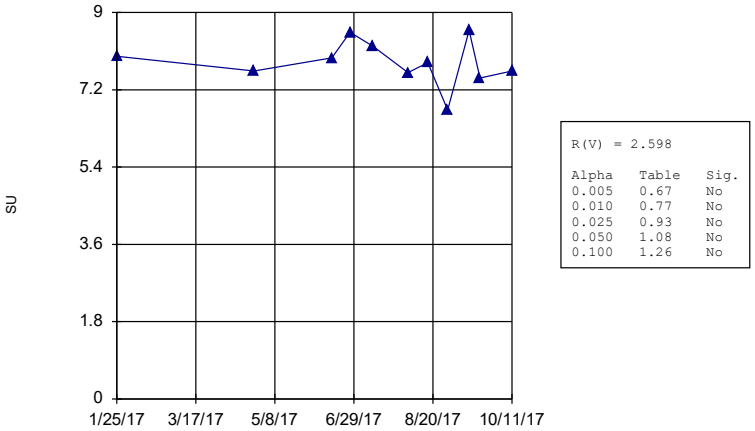
Rank Von Neumann

MW-15



R(V) = 2.598

Alpha	Table	Sig.
0.005	0.67	No
0.010	0.77	No
0.025	0.93	No
0.050	1.08	No
0.100	1.26	No

Constituent: pH, field Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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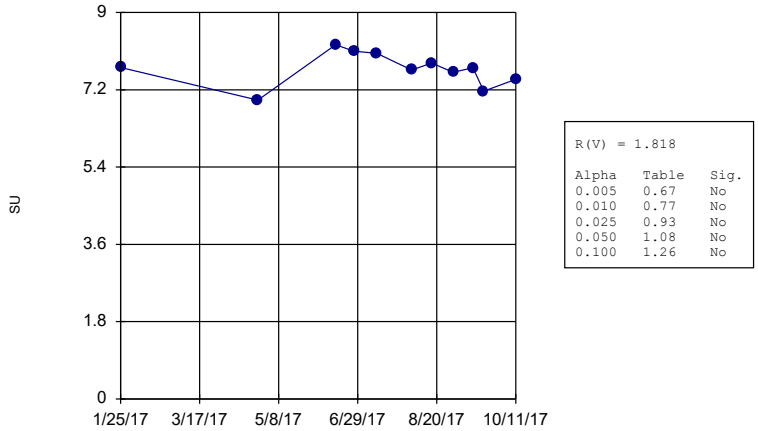
Rank Von Neumann

SP-4 (bg)



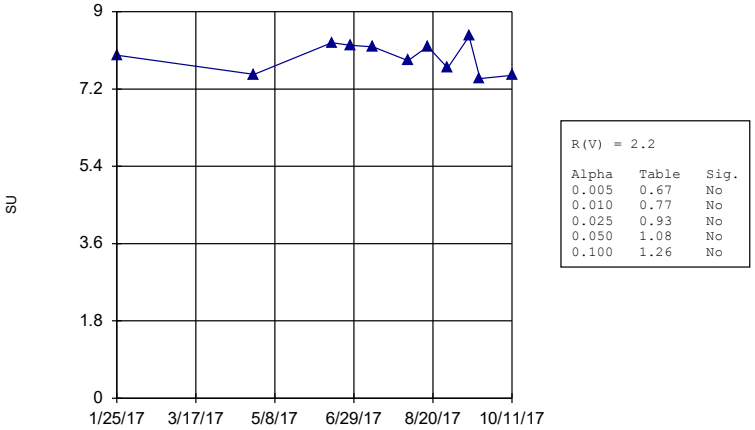
R(V) = 1.818

Alpha	Table	Sig.
0.005	0.67	No
0.010	0.77	No
0.025	0.93	No
0.050	1.08	No
0.100	1.26	No

Constituent: pH, field Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-5R (bg)



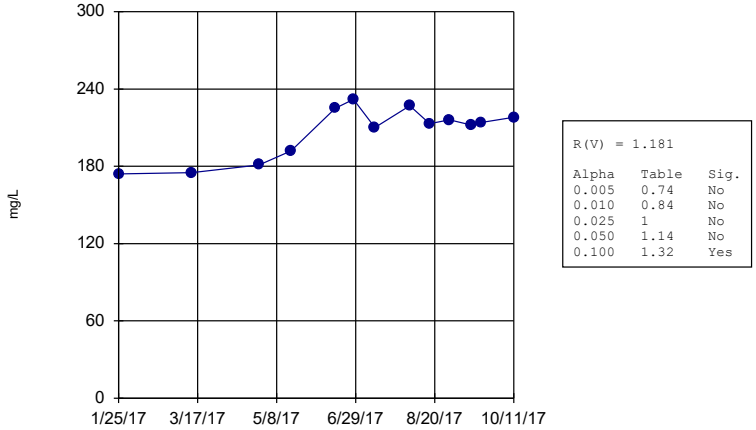
R(V) = 2.2

Alpha	Table	Sig.
0.005	0.67	No
0.010	0.77	No
0.025	0.93	No
0.050	1.08	No
0.100	1.26	No

Constituent: pH, field Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-3D



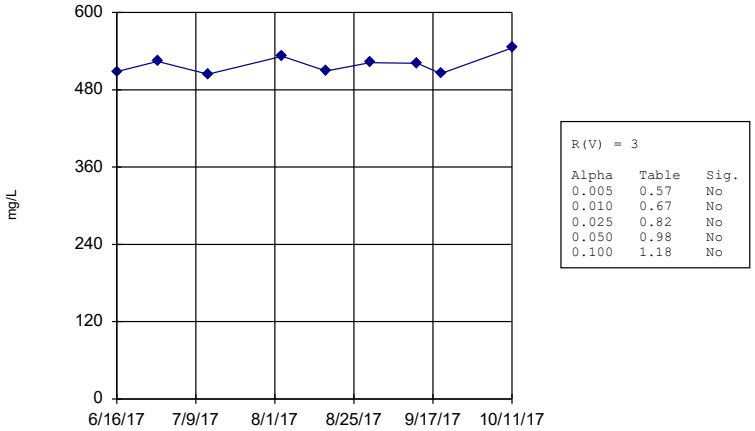
R(V) = 1.181

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	Yes

Constituent: Sulfate Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-6D



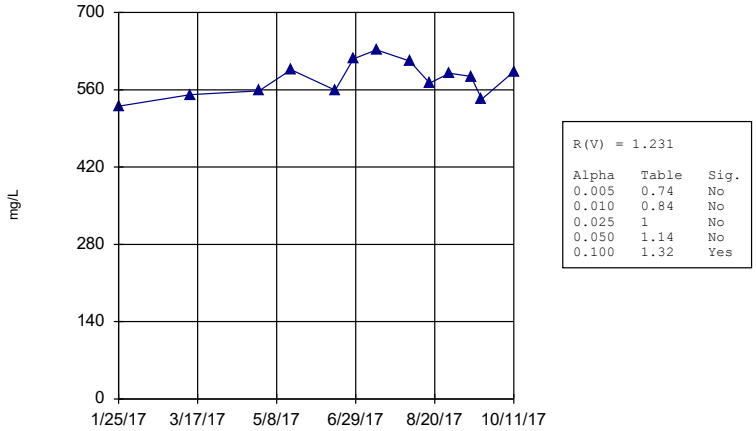
R(V) = 3

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: Sulfate Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-15



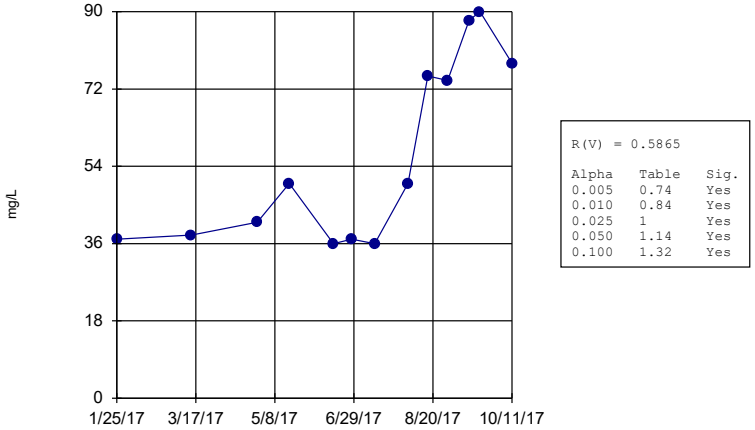
R(V) = 1.231

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	Yes

Constituent: Sulfate Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-4 (bg)



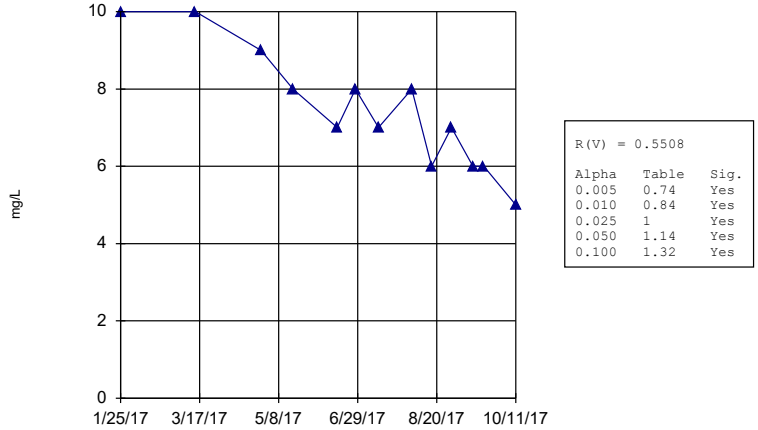
R(V) = 0.5865

Alpha	Table	Sig.
0.005	0.74	Yes
0.010	0.84	Yes
0.025	1	Yes
0.050	1.14	Yes
0.100	1.32	Yes

Constituent: Sulfate Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-5R (bg)



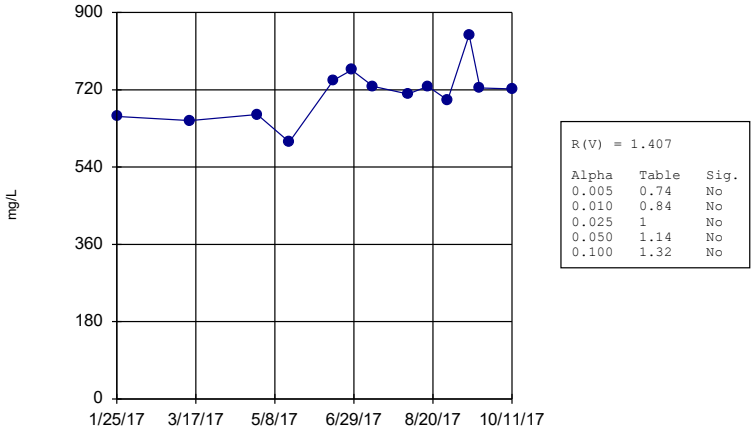
R(V) = 0.5508

Alpha	Table	Sig.
0.005	0.74	Yes
0.010	0.84	Yes
0.025	1	Yes
0.050	1.14	Yes
0.100	1.32	Yes

Constituent: Sulfate Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2017
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-3D



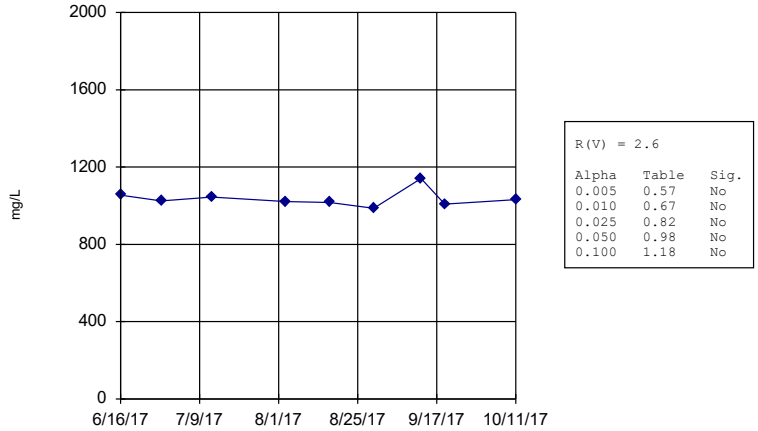
R(V) = 1.407

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-6D



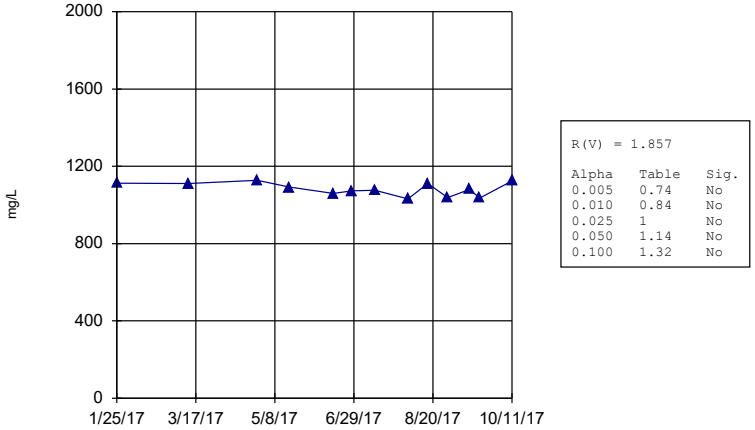
R(V) = 2.6

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-15



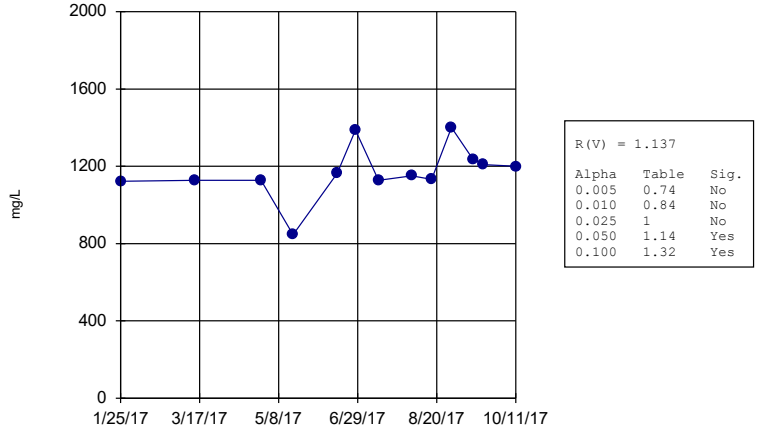
R(V) = 1.857

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	No
0.100	1.32	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-4 (bg)



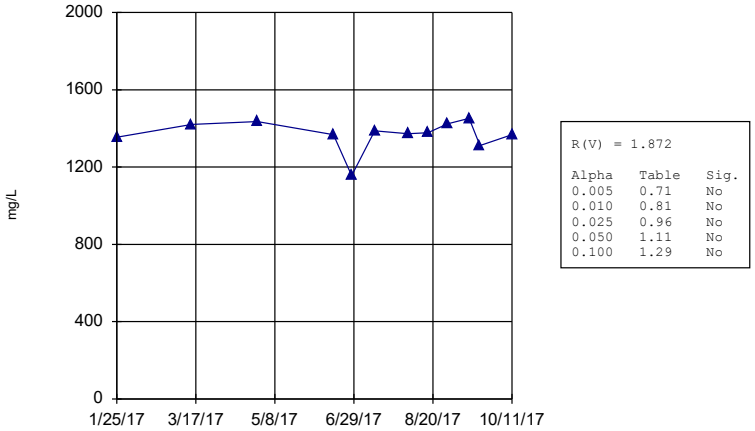
R(V) = 1.137

Alpha	Table	Sig.
0.005	0.74	No
0.010	0.84	No
0.025	1	No
0.050	1.14	Yes
0.100	1.32	Yes

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

SP-5R (bg)



R(V) = 1.872

Alpha	Table	Sig.
0.005	0.71	No
0.010	0.81	No
0.025	0.96	No
0.050	1.11	No
0.100	1.29	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:28 PM View: Rank Von Neumann - 2
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE E

Rank Von Neumann – 2018

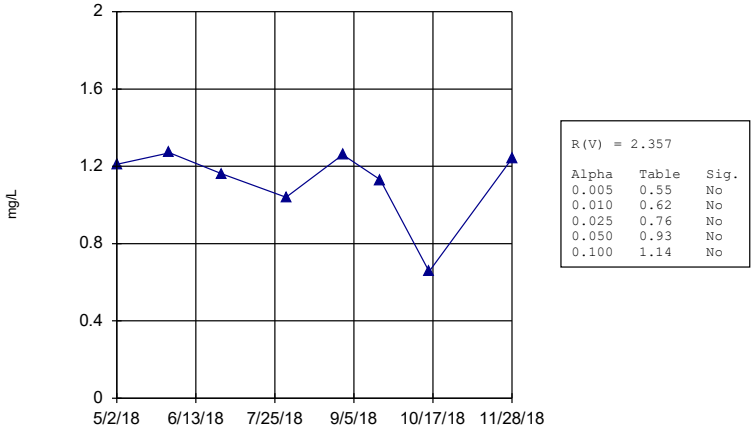
Rank Von Neumann - 2018 - All Results (No Significant)

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 4:37 PM

Constituent	Well	N	R(V)	Alpha	Table	Sig.
Boron (mg/L)	MW-4D	8	2.357	0.010	0.62	No
Boron (mg/L)	MW-5D	8	1.952	0.010	0.62	No
Boron (mg/L)	MW-12D	8	0.9524	0.010	0.62	No
Calcium (mg/L)	MW-4D	8	2.167	0.010	0.62	No
Calcium (mg/L)	MW-5D	8	0.881	0.010	0.62	No
Calcium (mg/L)	MW-12D	8	1.762	0.010	0.62	No
Chloride (mg/L)	MW-4D	8	0.8929	0.010	0.62	No
Chloride (mg/L)	MW-5D	8	1.339	0.010	0.62	No
Chloride (mg/L)	MW-12D	7	1.205	0.010	0.54	No
Fluoride (mg/L)	MW-4D	8	1.065	0.010	0.62	No
Fluoride (mg/L)	MW-5D	8	1.357	0.010	0.62	No
Fluoride (mg/L)	MW-12D	8	1.119	0.010	0.62	No
pH, field (SU)	MW-4D	9	2.133	0.010	0.67	No
pH, field (SU)	MW-5D	9	1.229	0.010	0.67	No
pH, field (SU)	MW-12D	9	1.35	0.010	0.67	No
Sulfate (mg/L)	MW-4D	8	1.619	0.010	0.62	No
Sulfate (mg/L)	MW-5D	7	0.6429	0.010	0.54	No
Sulfate (mg/L)	MW-12D	8	1.214	0.010	0.62	No
Total Dissolved Solids [TDS] (m...	MW-4D	8	1.643	0.010	0.62	No
Total Dissolved Solids [TDS] (m...	MW-5D	8	2.03	0.010	0.62	No
Total Dissolved Solids [TDS] (m...	MW-12D	8	1.905	0.010	0.62	No

Rank Von Neumann

MW-4D



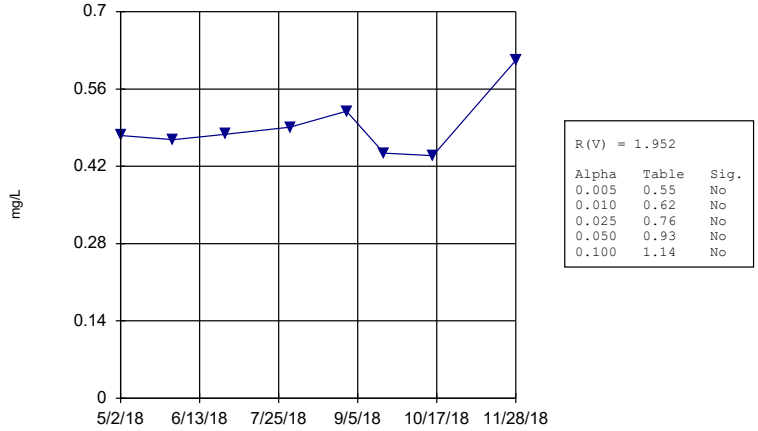
R(V) = 2.357

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Boron Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-5D



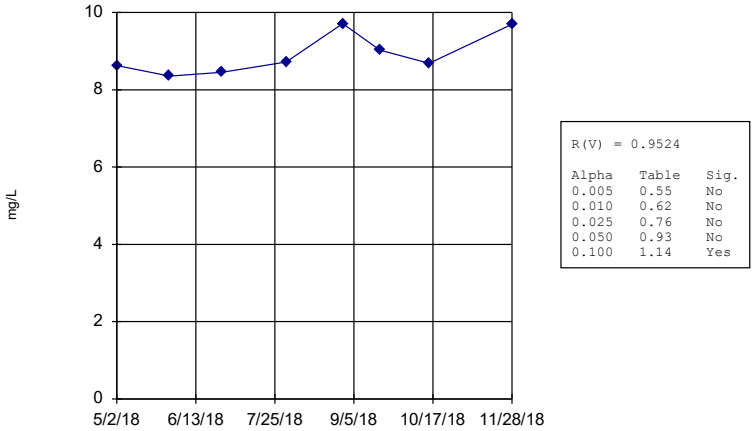
R(V) = 1.952

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Boron Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-12D



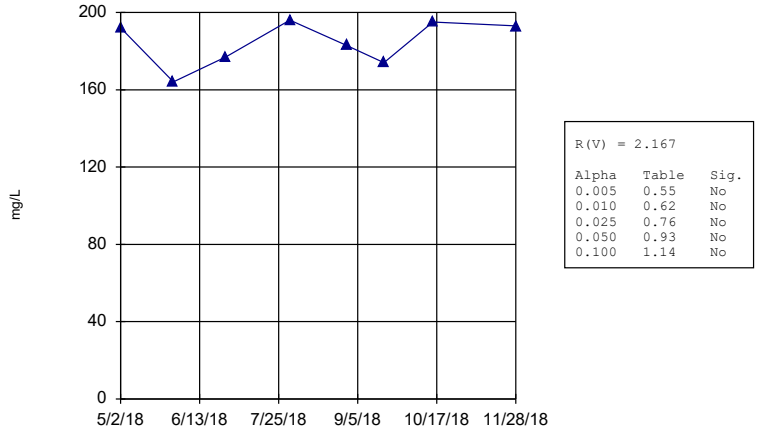
R(V) = 0.9524

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	Yes

Constituent: Boron Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-4D



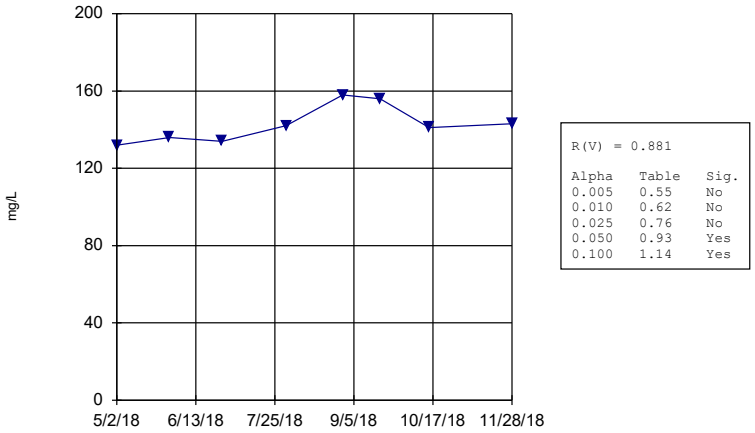
R(V) = 2.167

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Calcium Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-5D



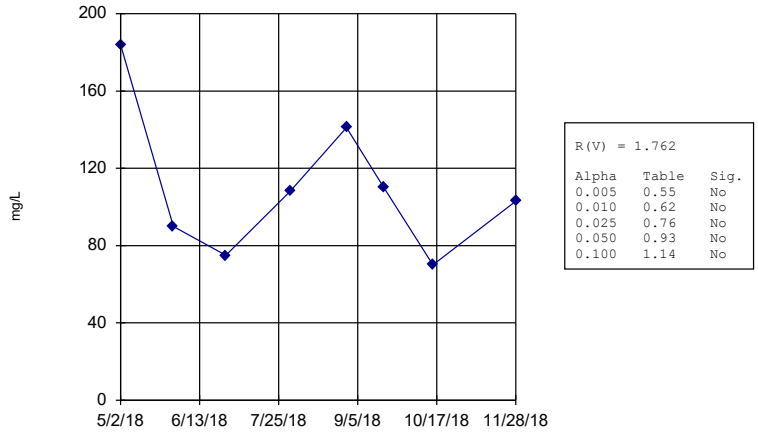
R(V) = 0.881

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	Yes
0.100	1.14	Yes

Constituent: Calcium Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-12D



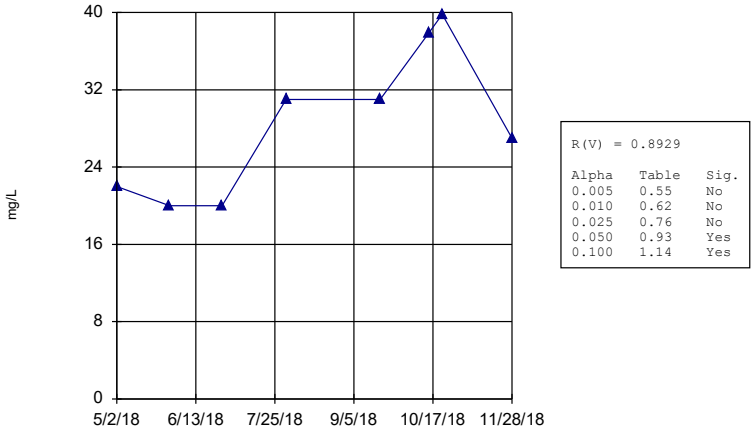
R(V) = 1.762

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Calcium Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-4D



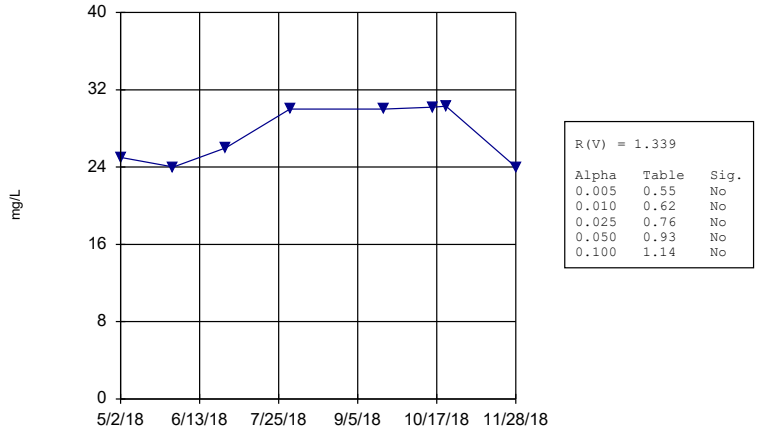
R(V) = 0.8929

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	Yes
0.100	1.14	Yes

Constituent: Chloride Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-5D



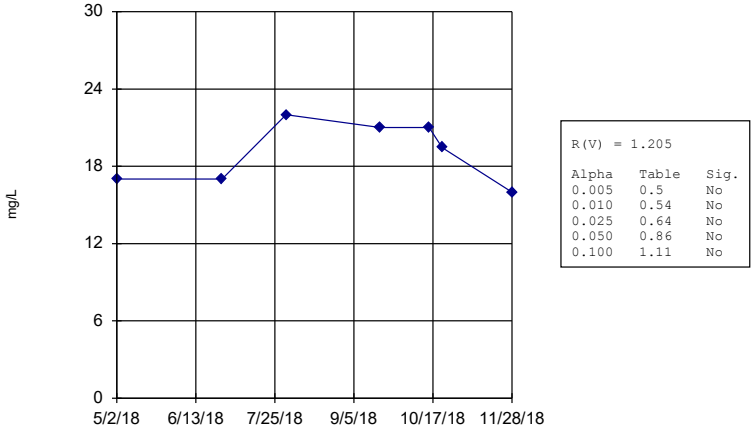
R(V) = 1.339

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Chloride Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-12D



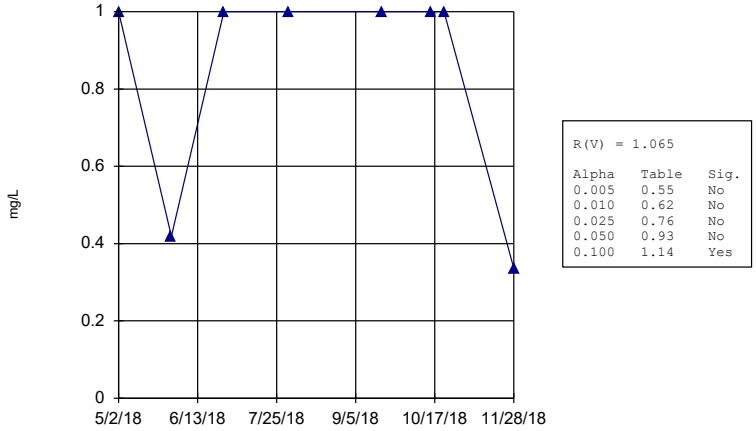
R(V) = 1.205

Alpha	Table	Sig.
0.005	0.5	No
0.010	0.54	No
0.025	0.64	No
0.050	0.86	No
0.100	1.11	No

Constituent: Chloride Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-4D



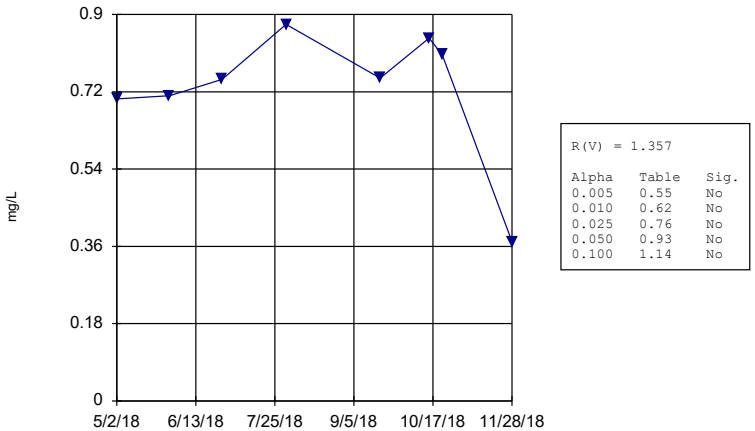
R(V) = 1.065

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	Yes

Constituent: Fluoride Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-5D



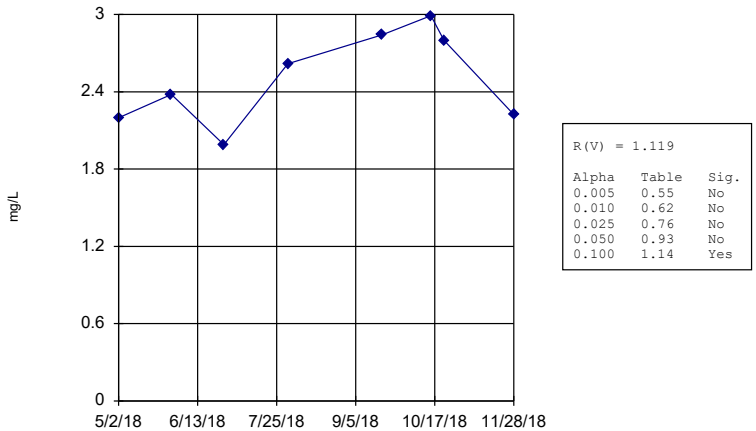
R(V) = 1.357

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Fluoride Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-12D



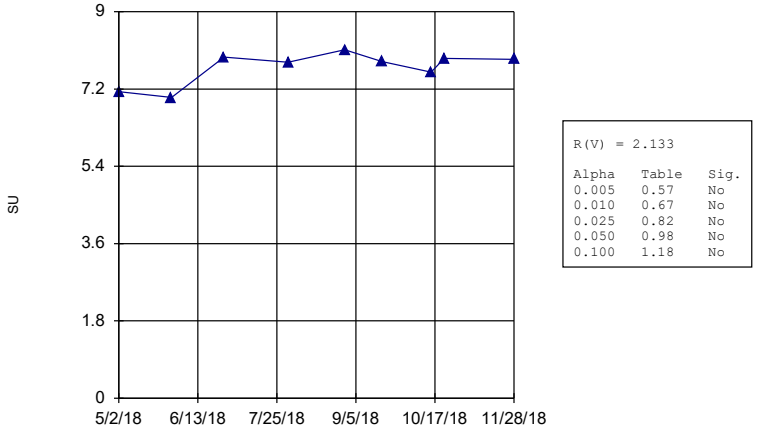
R(V) = 1.119

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	Yes

Constituent: Fluoride Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-4D



R(V) = 2.133

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: pH, field Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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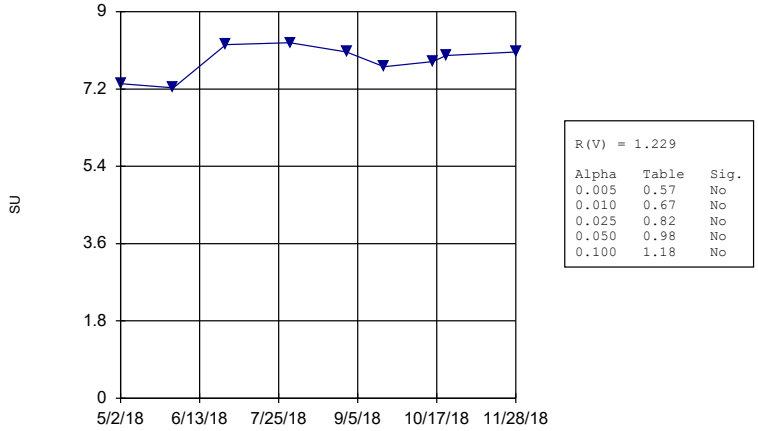
Rank Von Neumann

MW-5D



R(V) = 1.229

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: pH, field Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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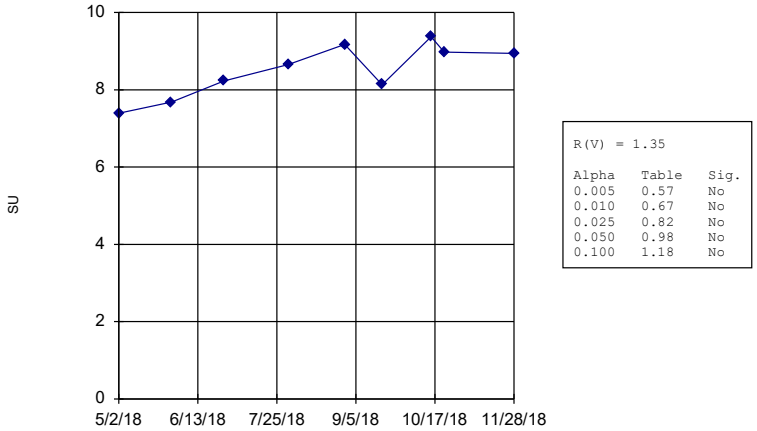
Rank Von Neumann

MW-12D



R(V) = 1.35

Alpha	Table	Sig.
0.005	0.57	No
0.010	0.67	No
0.025	0.82	No
0.050	0.98	No
0.100	1.18	No

Constituent: pH, field Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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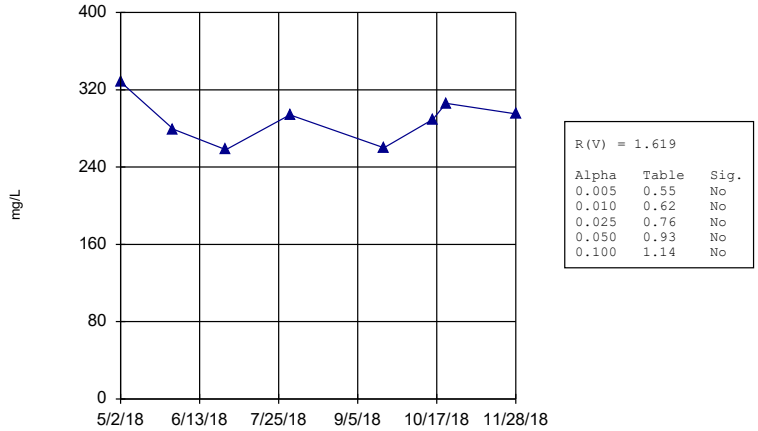
Rank Von Neumann

MW-4D



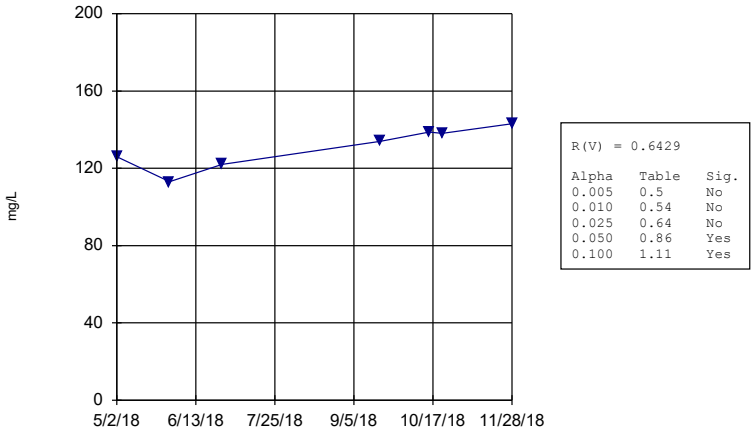
R(V) = 1.619

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Sulfate Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-5D



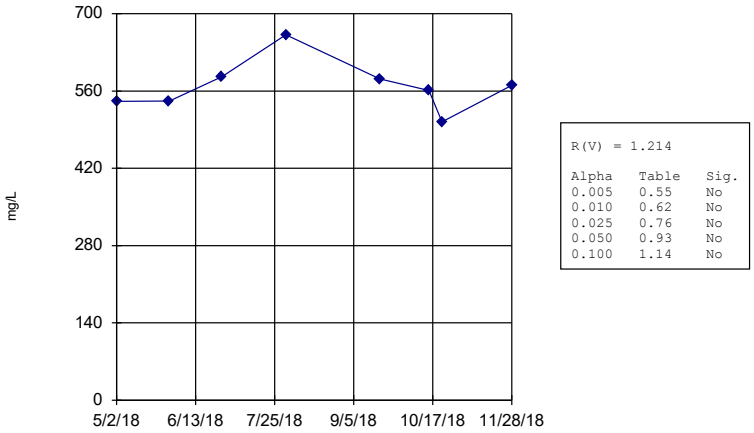
R(V) = 0.6429

Alpha	Table	Sig.
0.005	0.5	No
0.010	0.54	No
0.025	0.64	No
0.050	0.86	Yes
0.100	1.11	Yes

Constituent: Sulfate Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-12D



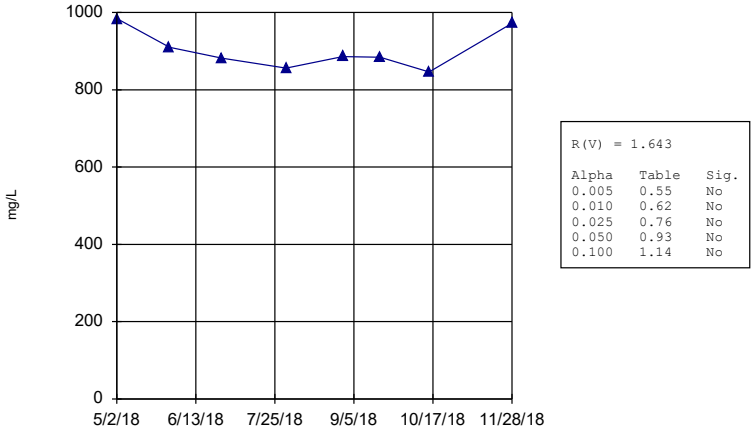
R(V) = 1.214

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Sulfate Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2018
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-4D



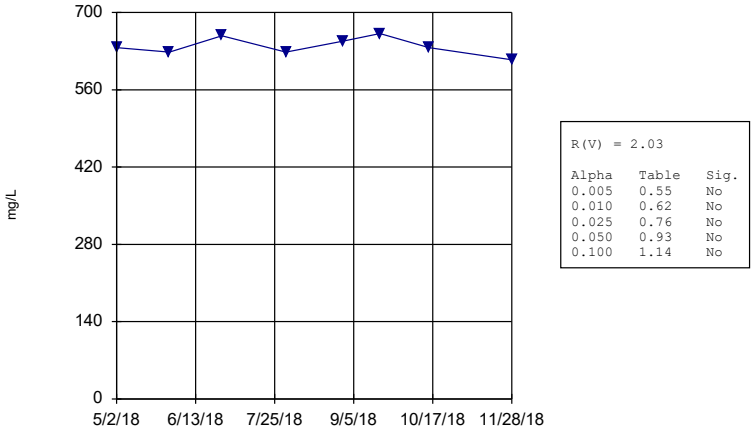
R(V) = 1.643

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-5D



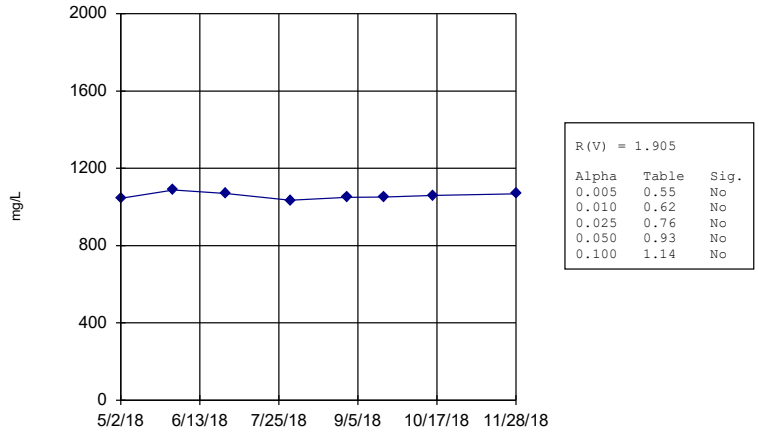
R(V) = 2.03

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Rank Von Neumann

MW-12D



R(V) = 1.905

Alpha	Table	Sig.
0.005	0.55	No
0.010	0.62	No
0.025	0.76	No
0.050	0.93	No
0.100	1.14	No

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:36 PM View: Rank Von Neumann - 2

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE F

ANOVA

Analysis of Variance - Significant Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 11/26/2024, 11:03 AM

Constituent	Well	Calc.	Crit.	Alpha	Transform	ANOVA Sig.	Calc.	Tab.	Alpha	Method
Boron (mg/L)	n/a	n/a	n/a	n/a	No	Yes	34.1	3.841	0.05	NP (normality)
Calcium (mg/L)	n/a	n/a	n/a	n/a	No	Yes	6.967	3.841	0.05	NP (normality)
Chloride (mg/L)	n/a	n/a	n/a	n/a	No	Yes	35.29	3.841	0.05	NP (normality)
Sulfate (mg/L)	n/a	n/a	n/a	n/a	sqrt(x)	Yes	1007	4.26	0.05	Param.
Total Dissolved Solids [TDS] (mg/L)	n/a	n/a	n/a	n/a	No	Yes	30.83	3.841	0.05	NP (normality)

Analysis of Variance - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 11/26/2024, 11:02 AM

Constituent	Well	Calc.	Crit.	Alpha	Transform	ANOVA Sig.	Calc.	Tab.	Alpha	Method
Boron (mg/L)	n/a	n/a	n/a	n/a	No	Yes	34.1	3.841	0.05	NP (normality)
Calcium (mg/L)	n/a	n/a	n/a	n/a	No	Yes	6.967	3.841	0.05	NP (normality)
Chloride (mg/L)	n/a	n/a	n/a	n/a	No	Yes	35.29	3.841	0.05	NP (normality)
Fluoride (mg/L)	n/a	n/a	n/a	n/a	No	No	2.177	3.841	0.05	NP (normality)
pH, field (SU)	n/a	n/a	n/a	n/a	No	No	0.9234	3.841	0.05	NP (normality)
Sulfate (mg/L)	n/a	n/a	n/a	n/a	sqrt(x)	Yes	1007	4.26	0.05	Param.
Total Dissolved Solids [TDS] (mg/L)	n/a	n/a	n/a	n/a	No	Yes	30.83	3.841	0.05	NP (normality)

Non-Parametric ANOVA

Constituent: Boron Analysis Run 11/26/2024 11:02 AM View: ANOVA
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

For observations made between 1/25/2017 and 10/10/2023, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 34.1

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 4 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 34.09
Adjusted Kruskal-Wallis statistic (H') = 34.1

Non-Parametric ANOVA

Constituent: Calcium Analysis Run 11/26/2024 11:02 AM View: ANOVA
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

For observations made between 1/25/2017 and 10/10/2023, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 6.967

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 2 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 6.966
Adjusted Kruskal-Wallis statistic (H') = 6.967

Non-Parametric ANOVA

Constituent: Chloride Analysis Run 11/26/2024 11:02 AM View: ANOVA
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

For observations made between 1/25/2017 and 10/10/2023, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 35.29

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 3 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 35.28
Adjusted Kruskal-Wallis statistic (H') = 35.29

Non-Parametric ANOVA

Constituent: Fluoride Analysis Run 11/26/2024 11:02 AM View: ANOVA
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

For observations made between 1/25/2017 and 10/10/2023, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 2.177

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 8 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 2.175
Adjusted Kruskal-Wallis statistic (H') = 2.177

Non-Parametric ANOVA

Constituent: pH, field Analysis Run 11/26/2024 11:02 AM View: ANOVA
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

For observations made between 1/25/2017 and 10/10/2023, the non-parametric analysis of variance test indicates NO DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is less than or equal to the Chi-squared value, we conclude that no group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 0.9234

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 6 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 0.9232
Adjusted Kruskal-Wallis statistic (H') = 0.9234

Parametric ANOVA

Constituent: Sulfate Analysis Run 11/26/2024 11:02 AM View: ANOVA
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

For observations made between 7/30/2018 and 10/10/2023 the parametric analysis of variance test (after square root transformation) indicates VARIATION at the 5% significance level. Because the calculated F statistic is greater than the tabulated F statistic, the hypothesis of a single homogeneous population is rejected.

Calculated F statistic = 1007

Tabulated F statistic = 4.26 with 1 and 24 degrees of freedom at the 5% significance level.

ONE-WAY PARAMETRIC ANOVA TABLE

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	F
Between Groups	285.5	1	285.5	1007
Error Within Groups	6.801	24	0.2834	
Total	292.3	25		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.01, calculated = 0.9388, critical = 0.891. Levene's Equality of Variance test passed. Calculated = 0.02972, tabulated = 4.26.

Non-Parametric ANOVA

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/26/2024 11:02 AM View: ANOVA
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

For observations made between 1/25/2017 and 10/10/2023, the non-parametric analysis of variance test indicates a DIFFERENCE between the medians of the groups tested at the 5% significance level. Because the calculated Kruskal-Wallis statistic is greater than the Chi-squared value, we conclude that at least one group has a significantly different median concentration of this constituent when compared to another group.

Calculated Kruskal-Wallis statistic = 30.83

Tabulated Chi-Squared value = 3.841 with 1 degree of freedom at the 5% significance level.

There were 8 groups of ties in the data, consequently the Kruskal-Wallis statistic (H) was adjusted. The adjusted statistic (H') was utilized to determine if the medians were equal.
Kruskal-Wallis statistic (H) = 30.79
Adjusted Kruskal-Wallis statistic (H') = 30.83

FIGURE G

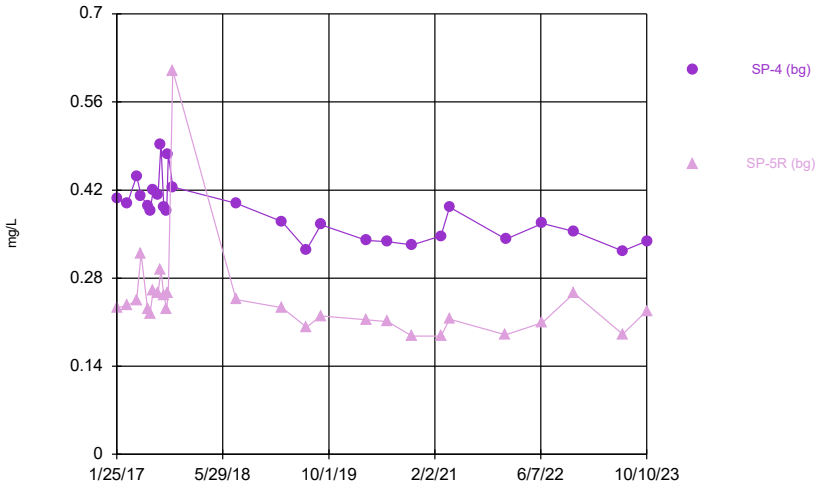
UTLs

Upper Tolerance Limits

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 11/26/2024, 11:05 AM

Constituent	Upper Lim.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	0.61	54	n/a	n/a	0	n/a	n/a	0.06267	NP Inter(n>table)
Calcium (mg/L)	182	41	n/a	n/a	0	n/a	n/a	0.1221	NP Inter(normality)
Chloride (mg/L)	968.3	49	23.88	3.148	0	None	sqrt(x)	0.01	Inter
Sulfate (mg/L)	83	26	n/a	n/a	0	n/a	n/a	0.2635	NP Inter(normality)
Total Dissolved Solids [TDS] (mg/L)	1940	51	n/a	n/a	0	n/a	n/a	0.0731	NP Inter(normality)

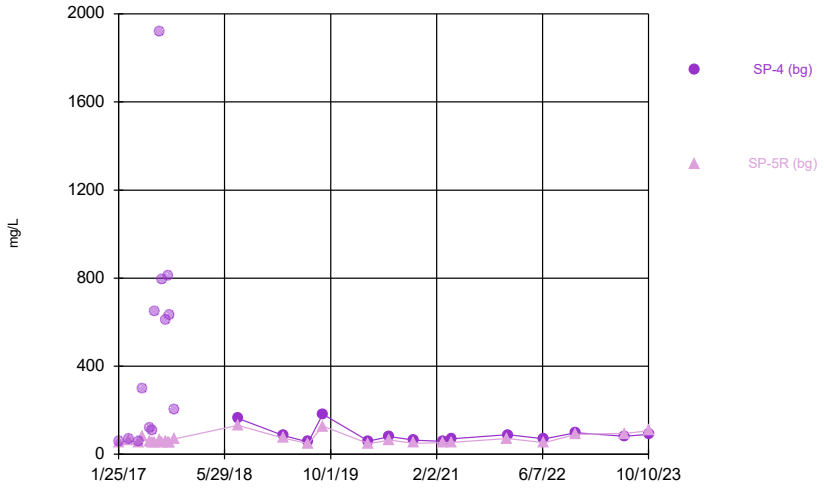
Time Series



Constituent: Boron Analysis Run 11/26/2024 11:04 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

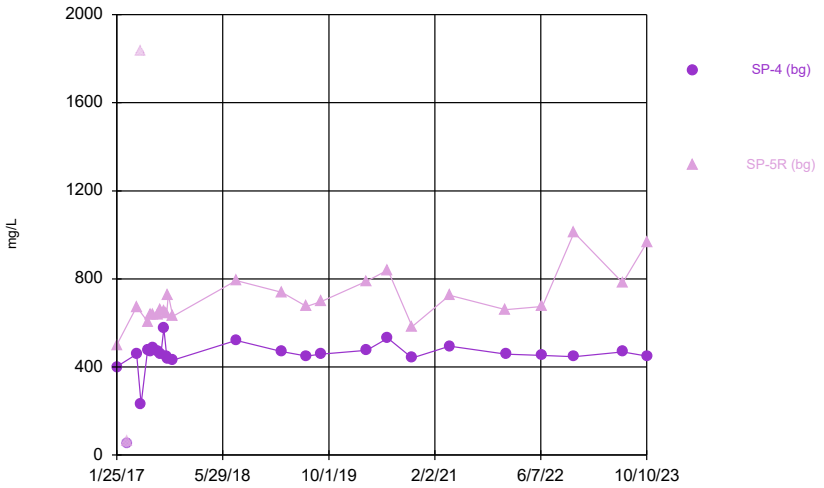
Time Series



Constituent: Calcium Analysis Run 11/26/2024 11:04 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

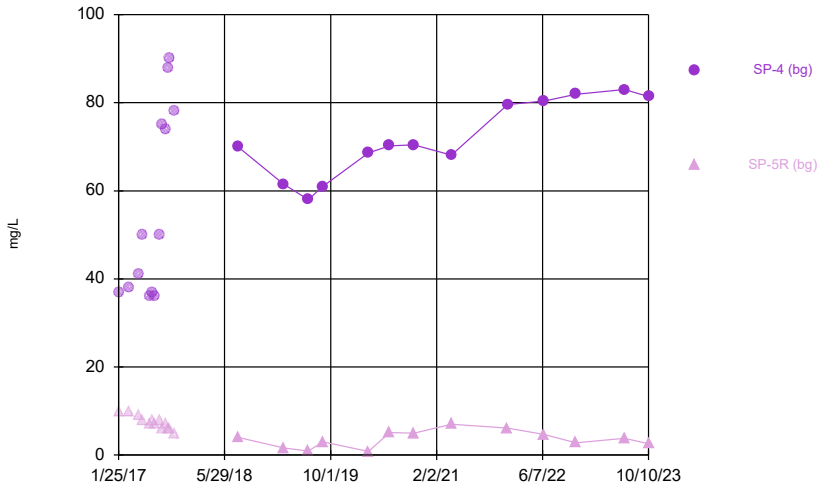
Time Series



Constituent: Chloride Analysis Run 11/26/2024 11:04 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

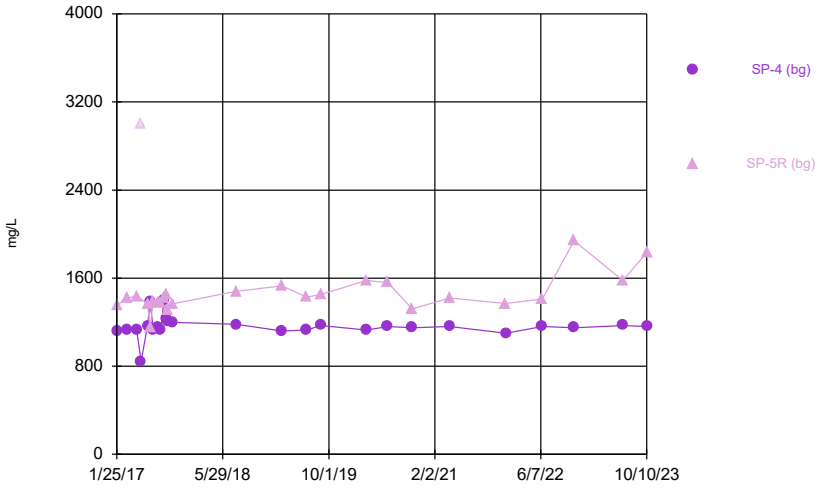
Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Time Series



Constituent: Sulfate Analysis Run 11/26/2024 11:04 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Time Series



Constituent: Total Dissolved Solids [TDS] Analysis Run 11/26/2024 11:04 AM View: Upper Tolerance Limi
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Tolerance Limit

Interwell Non-parametric

Non-parametric test used in lieu of parametric tolerance limit because no value exists in the tolerance factor table for n = 54, alpha = 0.01, one-tailed. 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: Boron Analysis Run 11/26/2024 11:05 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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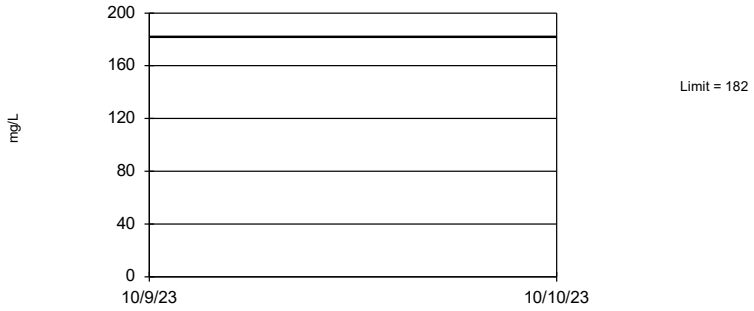
Tolerance Limit

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 41 background values. 89.26% coverage at alpha=0.01; 92.77% coverage at alpha=0.05; 98.24% coverage at alpha=0.5. Report alpha = 0.1221.

Constituent: Calcium Analysis Run 11/26/2024 11:05 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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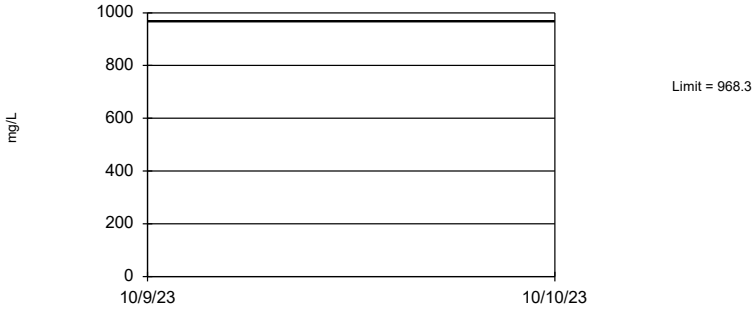
Tolerance Limit

Interwell Parametric



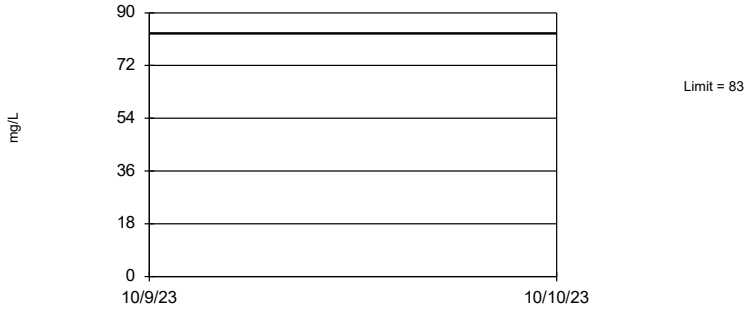
95% coverage. Background Data Summary (based on square root transformation): Mean=23.88, Std. Dev.=3.148, n=49. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9416, critical = 0.929. Report alpha = 0.01.

Constituent: Chloride Analysis Run 11/26/2024 11:05 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Tolerance Limit

Interwell Non-parametric

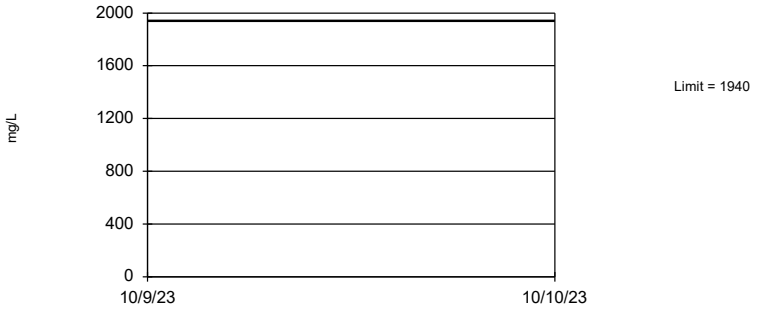


Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 26 background values. 83.79% coverage at alpha=0.01; 89.26% coverage at alpha=0.05; 97.46% coverage at alpha=0.5. Report alpha = 0.2635.

Constituent: Sulfate Analysis Run 11/26/2024 11:05 AM View: Upper Tolerance Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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 51 background values. 91.21% coverage at alpha=0.01; 94.34% coverage at alpha=0.05; 98.63% coverage at alpha=0.5. Report alpha = 0.0731.

Constituent: Total Dissolved Solids [TDS] Analysis Run 11/26/2024 11:05 AM View: Upper Tolerance Limi

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE H
Confidence Intervals

Confidence Interval Summary Table - Significant Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 4:46 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-2D	10.63	8.73	0.61	Yes	9	9.679	0.9824	0	None	No	0.01	Param.
Boron (mg/L)	MW-3D	0.9311	0.8656	0.61	Yes	27	0.8983	0.06872	0	None	No	0.01	Param.
Boron (mg/L)	MW-4D	1.157	0.8954	0.61	Yes	19	1.026	0.2237	0	None	No	0.01	Param.
Boron (mg/L)	MW-6D	3.602	3.002	0.61	Yes	23	3.248	0.6811	0	None	x^2	0.01	Param.
Boron (mg/L)	MW-9D	7.098	6.494	0.61	Yes	20	6.796	0.5322	0	None	No	0.01	Param.
Boron (mg/L)	MW-12D	8.769	7.505	0.61	Yes	19	8.137	1.079	0	None	No	0.01	Param.
Boron (mg/L)	MW-13D	1.494	0.7258	0.61	Yes	8	1.11	0.3625	0	None	No	0.01	Param.
Boron (mg/L)	MW-14	1.506	1.214	0.61	Yes	10	1.36	0.1631	0	None	No	0.01	Param.
Boron (mg/L)	MW-15	9.265	8.284	0.61	Yes	26	8.774	1.007	0	None	No	0.01	Param.
Sulfate (mg/L)	MW-3D	209.3	190.2	83	Yes	26	199.1	19.66	0	None	x^2	0.01	Param.
Sulfate (mg/L)	MW-4D	336	274	83	Yes	22	315.9	65.33	0	None	No	0.01	NP (normality)
Sulfate (mg/L)	MW-5D	150.8	134	83	Yes	19	142.4	14.29	0	None	No	0.01	Param.
Sulfate (mg/L)	MW-6D	504.2	458.6	83	Yes	23	481.4	43.57	0	None	No	0.01	Param.
Sulfate (mg/L)	MW-9D	758.2	547.7	83	Yes	11	652.9	126.3	0	None	No	0.01	Param.
Sulfate (mg/L)	MW-12D	579.7	521	83	Yes	20	550.3	51.64	0	None	No	0.01	Param.
Sulfate (mg/L)	MW-15	621.6	579.2	83	Yes	26	600.4	43.51	0	None	No	0.01	Param.

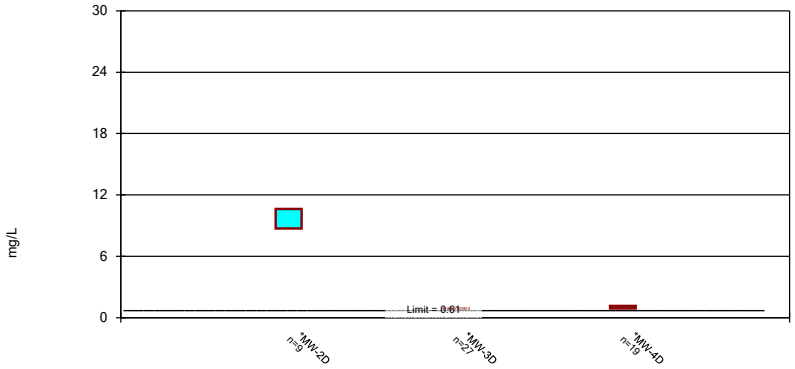
Confidence Interval Summary Table - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 4:46 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	**MW-2D**	**10.63**	**8.73**	**0.61**	**Yes**	**9**	**9.679**	**0.9824**	**0**	**None**	**No**	**0.01**	**Param.**
Boron (mg/L)	**MW-3D**	**0.9311**	**0.8656**	**0.61**	**Yes**	**27**	**0.8983**	**0.06872**	**0**	**None**	**No**	**0.01**	**Param.**
Boron (mg/L)	**MW-4D**	**1.157**	**0.8954**	**0.61**	**Yes**	**19**	**1.026**	**0.2237**	**0**	**None**	**No**	**0.01**	**Param.**
Boron (mg/L)	MW-5D	0.5202	0.4616	0.61	No	19	0.4909	0.05004	0	None	No	0.01	Param.
Boron (mg/L)	**MW-6D**	**3.602**	**3.002**	**0.61**	**Yes**	**23**	**3.248**	**0.6811**	**0**	**None**	**x^2**	**0.01**	**Param.**
Boron (mg/L)	**MW-9D**	**7.098**	**6.494**	**0.61**	**Yes**	**20**	**6.796**	**0.5322**	**0**	**None**	**No**	**0.01**	**Param.**
Boron (mg/L)	**MW-12D**	**8.769**	**7.505**	**0.61**	**Yes**	**19**	**8.137**	**1.079**	**0**	**None**	**No**	**0.01**	**Param.**
Boron (mg/L)	**MW-13D**	**1.494**	**0.7258**	**0.61**	**Yes**	**8**	**1.11**	**0.3625**	**0**	**None**	**No**	**0.01**	**Param.**
Boron (mg/L)	**MW-14**	**1.506**	**1.214**	**0.61**	**Yes**	**10**	**1.36**	**0.1631**	**0**	**None**	**No**	**0.01**	**Param.**
Boron (mg/L)	**MW-15**	**9.265**	**8.284**	**0.61**	**Yes**	**26**	**8.774**	**1.007**	**0**	**None**	**No**	**0.01**	**Param.**
Calcium (mg/L)	MW-2D	75.5	8.48	182	No	9	19.54	21.21	0	None	No	0.002	NP (normality)
Calcium (mg/L)	MW-3D	138.3	120.7	182	No	26	129.9	18.88	0	None	sqrt(x)	0.01	Param.
Calcium (mg/L)	MW-4D	188.2	171.8	182	No	20	180	14.42	0	None	No	0.01	Param.
Calcium (mg/L)	MW-5D	141.8	127.2	182	No	20	134.5	12.79	0	None	No	0.01	Param.
Calcium (mg/L)	MW-6D	209	175	182	No	22	192	31.72	0	None	No	0.01	Param.
Calcium (mg/L)	MW-9D	205.7	150.5	182	No	13	178.1	37.14	0	None	No	0.01	Param.
Calcium (mg/L)	MW-12D	104.5	72.51	182	No	20	89.94	31.04	0	None	sqrt(x)	0.01	Param.
Calcium (mg/L)	MW-13D	217.8	170.8	182	No	8	194.1	22.91	0	None	sqrt(x)	0.01	Param.
Calcium (mg/L)	MW-14	113.4	61.78	182	No	10	87.61	28.95	0	None	No	0.01	Param.
Calcium (mg/L)	MW-15	108.2	86.09	182	No	25	97.14	22.17	0	None	No	0.01	Param.
Chloride (mg/L)	MW-3D	13.58	12.39	968.3	No	12	12.98	0.7567	0	None	No	0.01	Param.
Chloride (mg/L)	MW-4D	31.85	24.86	968.3	No	20	28.36	6.157	0	None	No	0.01	Param.
Chloride (mg/L)	MW-5D	27.3	25	968.3	No	19	26.59	2.147	0	None	No	0.01	NP (normality)
Chloride (mg/L)	MW-6D	30.47	27.83	968.3	No	22	28.64	3.974	0	None	x^4	0.01	Param.
Chloride (mg/L)	MW-9D	100	25.3	968.3	No	13	48.93	32.71	0	None	No	0.01	NP (normality)
Chloride (mg/L)	MW-12D	17.86	14.41	968.3	No	19	16.13	2.949	0	None	No	0.01	Param.
Chloride (mg/L)	MW-15	33	15.5	968.3	No	12	21.12	9.604	0	None	No	0.01	NP (normality)
Sulfate (mg/L)	**MW-3D**	**209.3**	**190.2**	**83**	**Yes**	**26**	**199.1**	**19.66**	**0**	**None**	**x^2**	**0.01**	**Param.**
Sulfate (mg/L)	**MW-4D**	**336**	**274**	**83**	**Yes**	**22**	**315.9**	**65.33**	**0**	**None**	**No**	**0.01**	**NP (normality)**
Sulfate (mg/L)	**MW-5D**	**150.8**	**134**	**83**	**Yes**	**19**	**142.4**	**14.29**	**0**	**None**	**No**	**0.01**	**Param.**
Sulfate (mg/L)	**MW-6D**	**504.2**	**458.6**	**83**	**Yes**	**23**	**481.4**	**43.57**	**0**	**None**	**No**	**0.01**	**Param.**
Sulfate (mg/L)	**MW-9D**	**758.2**	**547.7**	**83**	**Yes**	**11**	**652.9**	**126.3**	**0**	**None**	**No**	**0.01**	**Param.**
Sulfate (mg/L)	**MW-12D**	**579.7**	**521**	**83**	**Yes**	**20**	**550.3**	**51.64**	**0**	**None**	**No**	**0.01**	**Param.**
Sulfate (mg/L)	**MW-15**	**621.6**	**579.2**	**83**	**Yes**	**26**	**600.4**	**43.51**	**0**	**None**	**No**	**0.01**	**Param.**
Total Dissolved Solids [TDS] (mg/L)	MW-3D	716	662.3	1940	No	26	689.2	55.02	0	None	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-4D	900.3	817.9	1940	No	19	859.1	70.4	0	None	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-5D	644.7	615.8	1940	No	18	630.2	23.9	0	None	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-6D	1082	1037	1940	No	23	1059	43.27	0	None	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-9D	1378	1134	1940	No	13	1258	168.4	0	None	sqrt(x)	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-12D	1055	967.3	1940	No	19	1011	75.06	0	None	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-15	1101	1072	1940	No	25	1086	29.45	0	None	No	0.01	Param.

Parametric Confidence Interval

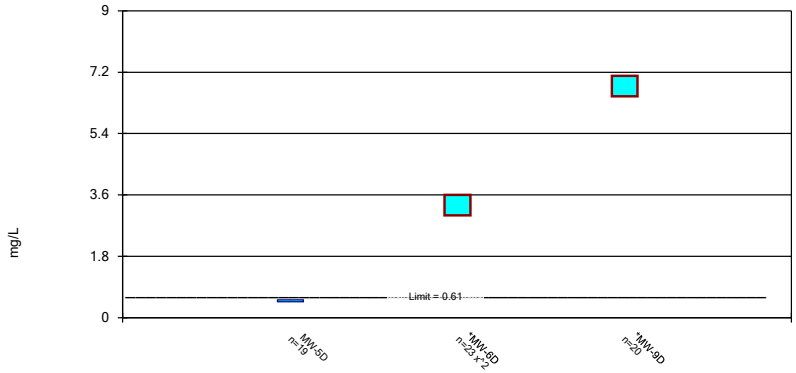
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

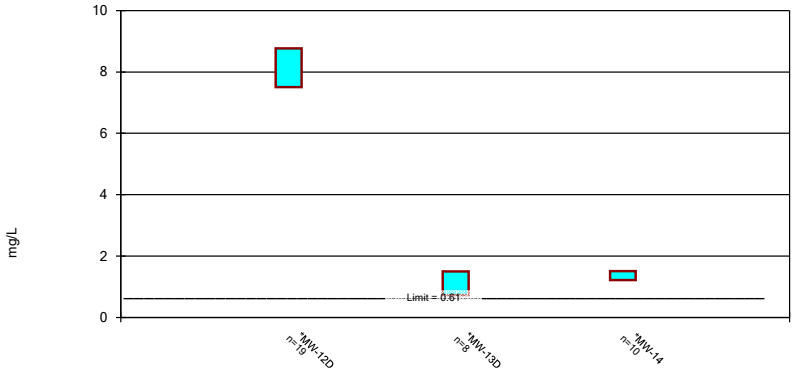
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

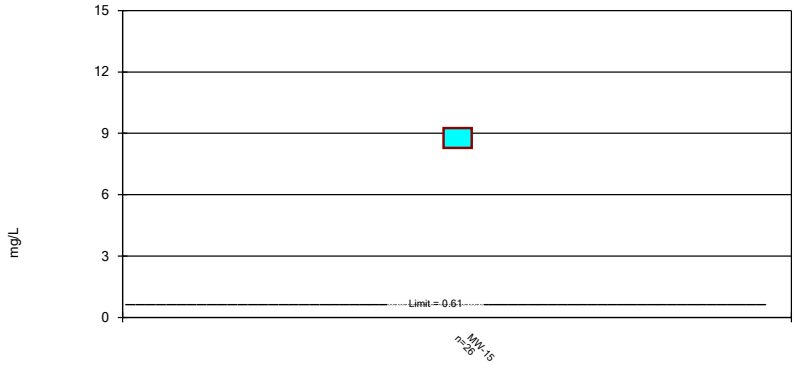
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

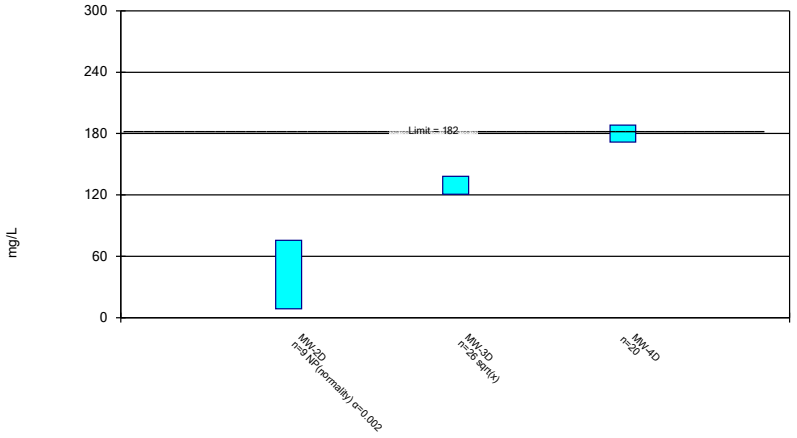
Compliance limit is exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric and Non-Parametric (NP) Confidence Interval

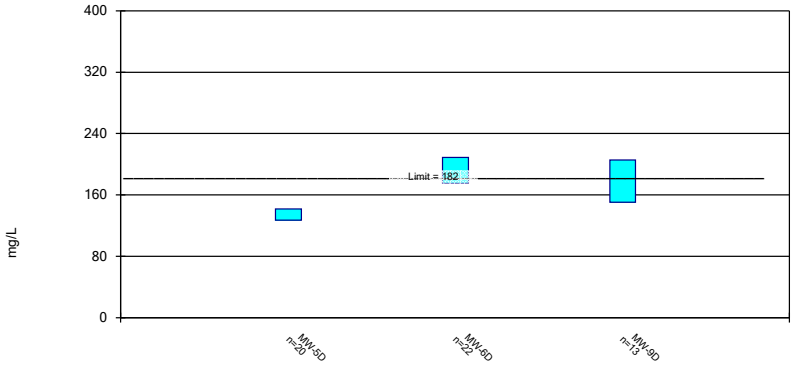
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Calcium Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

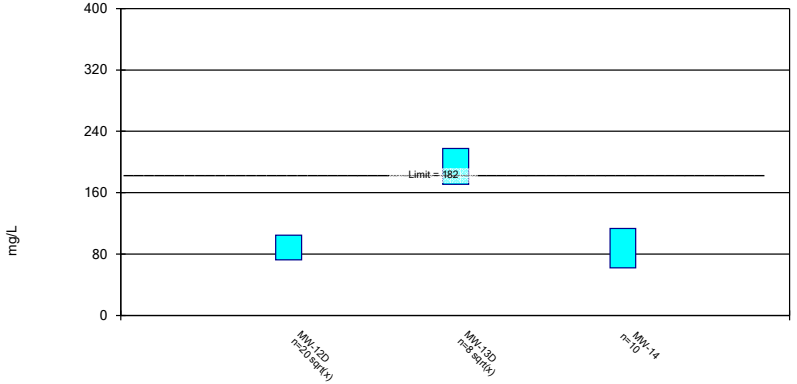
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Calcium Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

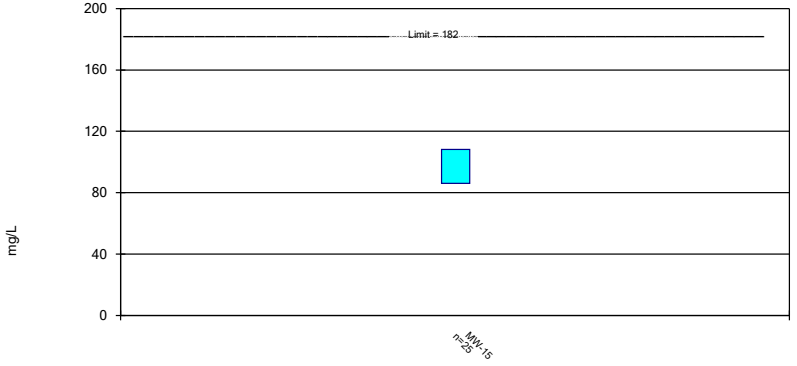
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Calcium Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

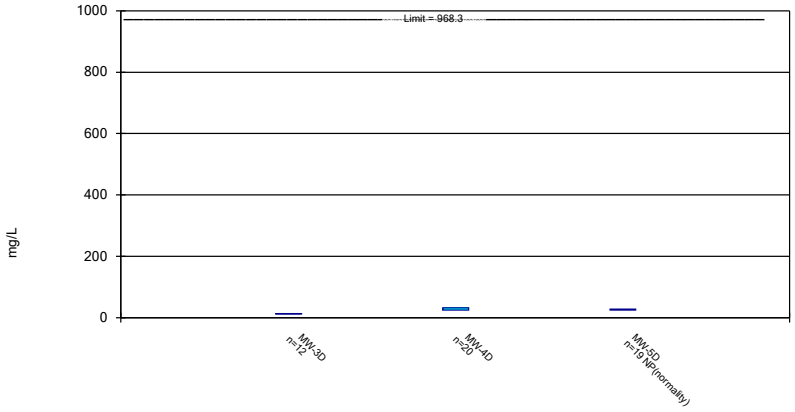
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Calcium Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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: Chloride Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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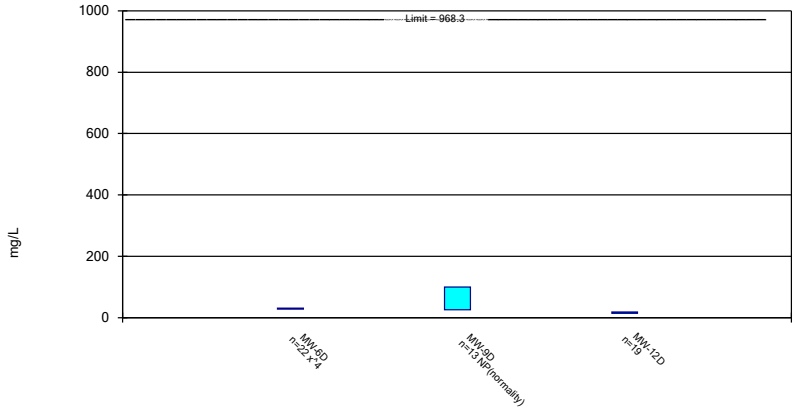
Parametric and Non-Parametric (NP) Confidence Interval

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



Constituent: Chloride Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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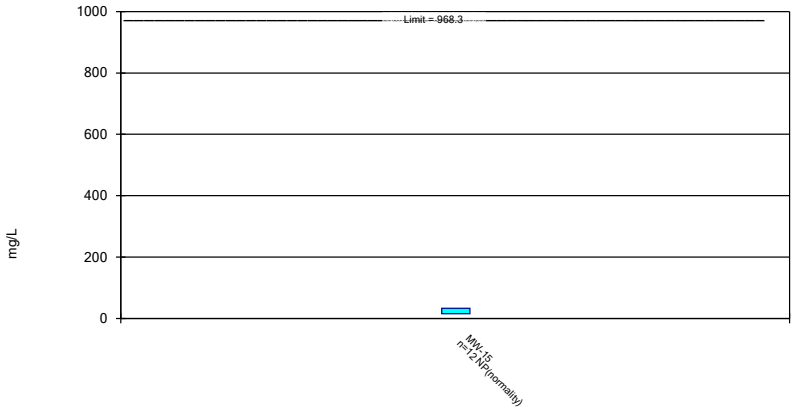
Non-Parametric Confidence Interval

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



Constituent: Chloride Analysis Run 12/2/2024 4:44 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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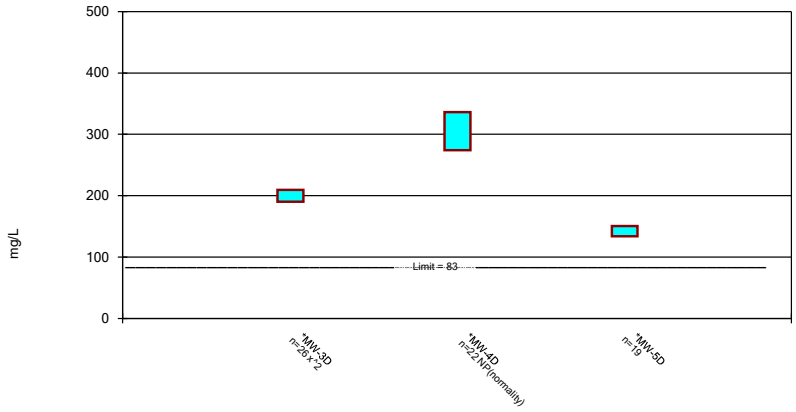
Parametric and Non-Parametric (NP) Confidence Interval

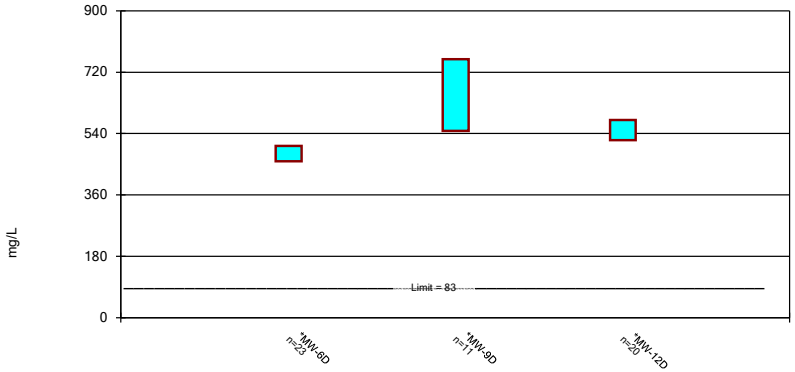
Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Sulfate Analysis Run 12/2/2024 4:45 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

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



Constituent: Sulfate Analysis Run 12/2/2024 4:45 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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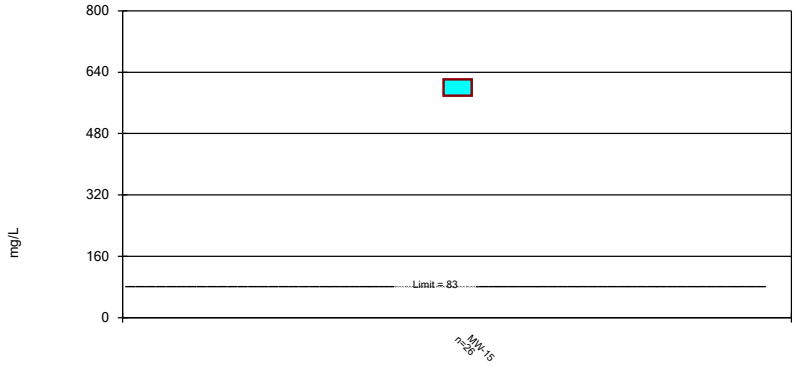
Parametric Confidence Interval

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

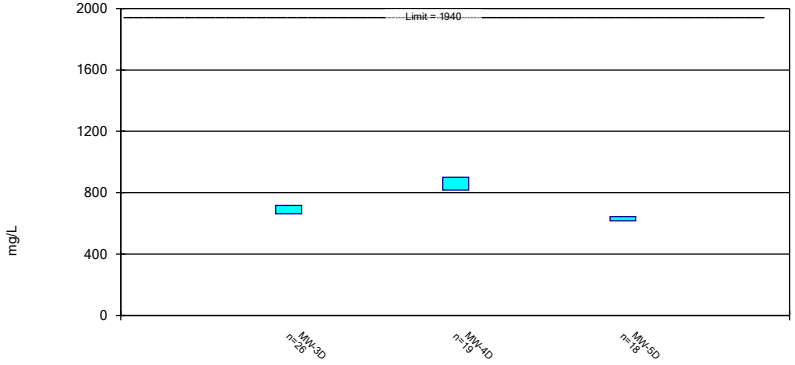


Constituent: Sulfate Analysis Run 12/2/2024 4:45 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Parametric Confidence Interval

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



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:45 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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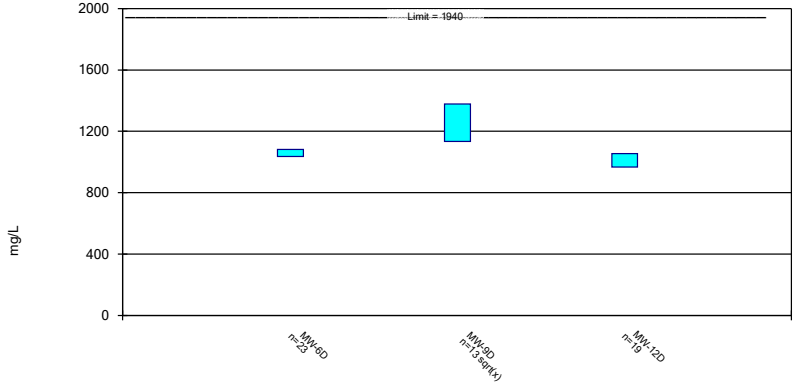
Parametric Confidence Interval

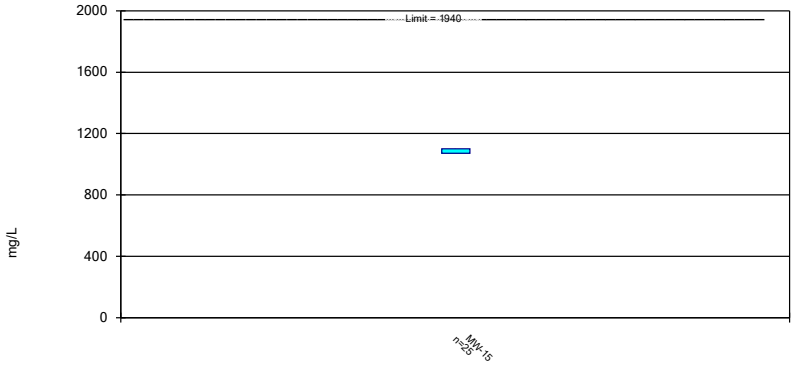
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:45 PM View: Confidence Intervals
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Parametric Confidence Interval

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



Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:45 PM View: Confidence Intervals

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE I

Trend Tests

Trend Tests - Significant Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 4:58 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Boron (mg/L)	**SP-4 (bg)**	**-0.01357**	**-180**	**-124**	**Yes**	**27**	**0**	**n/a**	**0.01**	**NP**
Boron (mg/L)	**SP-5R (bg)**	**-0.00878**	**-138**	**-124**	**Yes**	**27**	**0**	**n/a**	**0.01**	**NP**
Calcium (mg/L)	**MW-12D**	**-7.993**	**-84**	**-81**	**Yes**	**20**	**0**	**n/a**	**0.01**	**NP**
Calcium (mg/L)	**MW-15**	**5.908**	**113**	**111**	**Yes**	**25**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	**MW-12D**	**-0.9075**	**-98**	**-74**	**Yes**	**19**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	**MW-15**	**-1.909**	**-39**	**-38**	**Yes**	**12**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	**SP-5R (bg)**	**34.59**	**135**	**105**	**Yes**	**24**	**0**	**n/a**	**0.01**	**NP**
Sulfate (mg/L)	**SP-4 (bg)**	**4.952**	**54**	**43**	**Yes**	**13**	**0**	**n/a**	**0.01**	**NP**
Total Dissolved Solids [TDS] (mg/L)	**MW-12D**	**-35.18**	**-113**	**-74**	**Yes**	**19**	**0**	**n/a**	**0.01**	**NP**
Total Dissolved Solids [TDS] (mg/L)	**SP-5R (bg)**	**37.61**	**115**	**111**	**Yes**	**25**	**0**	**n/a**	**0.01**	**NP**

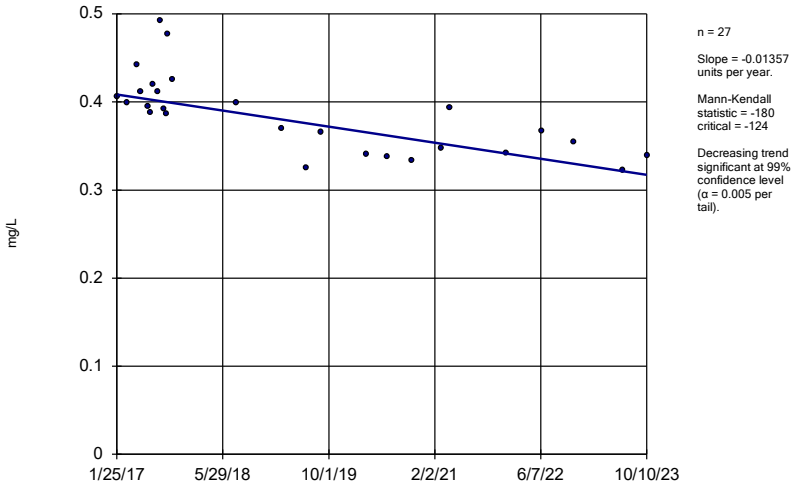
Trend Tests - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 4:58 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Alpha	Method
Boron (mg/L)	**SP-4 (bg)**	**-0.01357**	**-180**	**-124**	**Yes**	**27**	**0**	**n/a**	**0.01**	**NP**
Boron (mg/L)	**SP-5R (bg)**	**-0.00878**	**-138**	**-124**	**Yes**	**27**	**0**	**n/a**	**0.01**	**NP**
Calcium (mg/L)	MW-2D	-0.1195	0	25	No	9	0	n/a	0.01	NP
Calcium (mg/L)	MW-3D	-3.761	-111	-118	No	26	0	n/a	0.01	NP
Calcium (mg/L)	MW-4D	-5.34	-76	-81	No	20	0	n/a	0.01	NP
Calcium (mg/L)	MW-5D	-3.506	-72	-81	No	20	0	n/a	0.01	NP
Calcium (mg/L)	MW-6D	-6.905	-83	-92	No	22	0	n/a	0.01	NP
Calcium (mg/L)	MW-9D	-5.917	-10	-43	No	13	0	n/a	0.01	NP
Calcium (mg/L)	**MW-12D**	**-7.993**	**-84**	**-81**	**Yes**	**20**	**0**	**n/a**	**0.01**	**NP**
Calcium (mg/L)	MW-13D	4.775	8	21	No	8	0	n/a	0.01	NP
Calcium (mg/L)	MW-14	11.31	9	30	No	10	0	n/a	0.01	NP
Calcium (mg/L)	**MW-15**	**5.908**	**113**	**111**	**Yes**	**25**	**0**	**n/a**	**0.01**	**NP**
Calcium (mg/L)	SP-4 (bg)	1.35	9	48	No	14	0	n/a	0.01	NP
Calcium (mg/L)	SP-5R (bg)	2.527	57	124	No	27	0	n/a	0.01	NP
Chloride (mg/L)	MW-3D	-0.08333	-9	-38	No	12	0	n/a	0.01	NP
Chloride (mg/L)	MW-4D	1.135	45	81	No	20	0	n/a	0.01	NP
Chloride (mg/L)	MW-5D	0	-8	-74	No	19	0	n/a	0.01	NP
Chloride (mg/L)	MW-6D	-0.2713	-48	-92	No	22	0	n/a	0.01	NP
Chloride (mg/L)	MW-9D	-9.558	-43	-43	No	13	0	n/a	0.01	NP
Chloride (mg/L)	**MW-12D**	**-0.9075**	**-98**	**-74**	**Yes**	**19**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	**MW-15**	**-1.909**	**-39**	**-38**	**Yes**	**12**	**0**	**n/a**	**0.01**	**NP**
Chloride (mg/L)	SP-4 (bg)	0	0	111	No	25	0	n/a	0.01	NP
Chloride (mg/L)	**SP-5R (bg)**	**34.59**	**135**	**105**	**Yes**	**24**	**0**	**n/a**	**0.01**	**NP**
Fluoride (mg/L)	SP-4 (bg)	0.005715	10	131	No	28	3.571	n/a	0.01	NP
Fluoride (mg/L)	SP-5R (bg)	0.007758	26	131	No	28	0	n/a	0.01	NP
pH, field (SU)	SP-4 (bg)	-0.0149	-20	-118	No	26	0	n/a	0.01	NP
pH, field (SU)	SP-5R (bg)	-0.06293	-67	-118	No	26	0	n/a	0.01	NP
Sulfate (mg/L)	**SP-4 (bg)**	**4.952**	**54**	**43**	**Yes**	**13**	**0**	**n/a**	**0.01**	**NP**
Sulfate (mg/L)	SP-5R (bg)	0.2705	6	43	No	13	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-3D	-14.93	-116	-118	No	26	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-4D	-14.7	-74	-74	No	19	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-5D	-7.384	-54	-68	No	18	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-6D	5.32	49	98	No	23	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-9D	19.07	20	43	No	13	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	**MW-12D**	**-35.18**	**-113**	**-74**	**Yes**	**19**	**0**	**n/a**	**0.01**	**NP**
Total Dissolved Solids [TDS] (mg/L)	MW-15	0	-9	-111	No	25	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	SP-4 (bg)	2.056	27	118	No	26	0	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	**SP-5R (bg)**	**37.61**	**115**	**111**	**Yes**	**25**	**0**	**n/a**	**0.01**	**NP**

Sen's Slope Estimator

SP-4 (bg)



n = 27

Slope = -0.01357 units per year.

Mann-Kendall statistic = -180 critical = -124

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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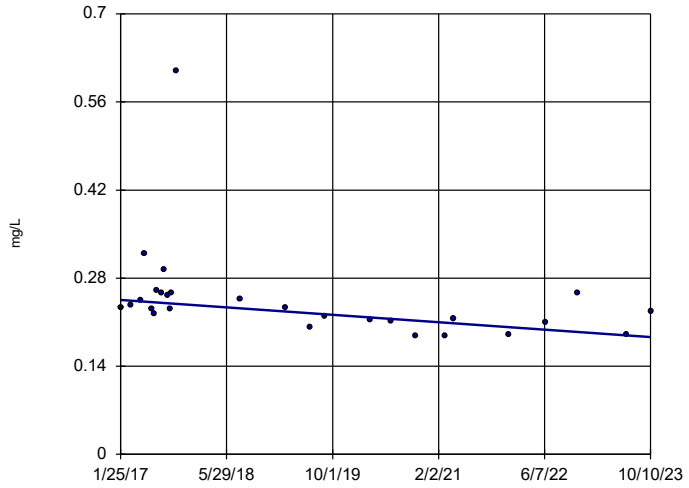
Sen's Slope Estimator

SP-5R (bg)



n = 27

Slope = -0.00878 units per year.

Mann-Kendall statistic = -138 critical = -124

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Boron Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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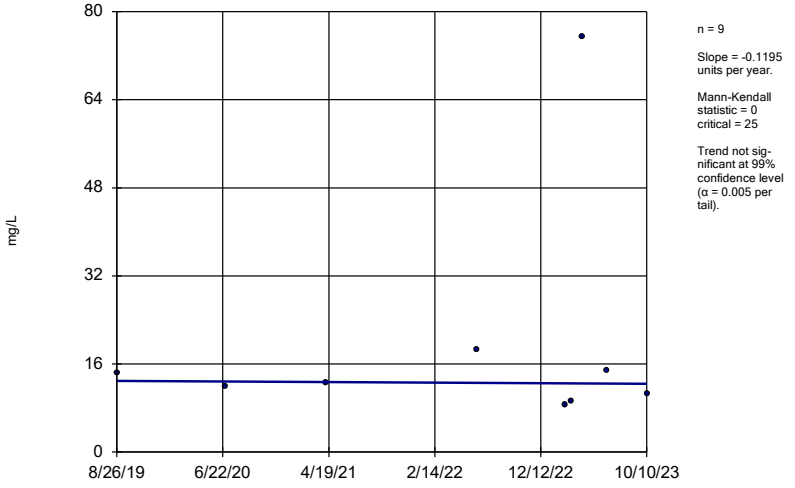
Sen's Slope Estimator

MW-2D



n = 9

Slope = -0.1195 units per year.

Mann-Kendall statistic = 0 critical = 25

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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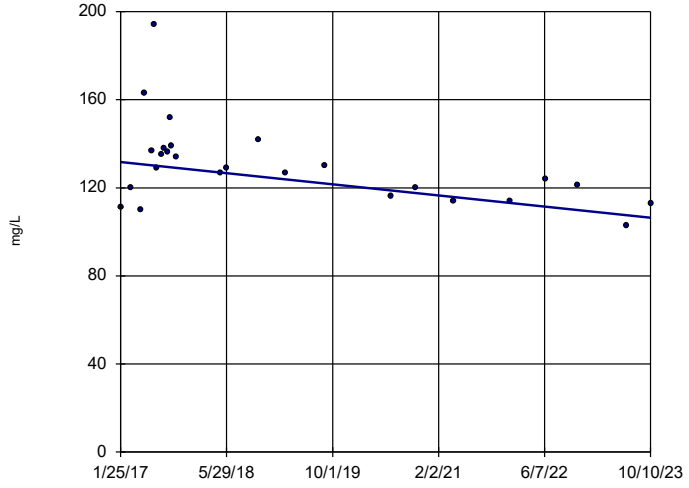
Sen's Slope Estimator

MW-3D



n = 26

Slope = -3.761 units per year.

Mann-Kendall statistic = -111 critical = -118

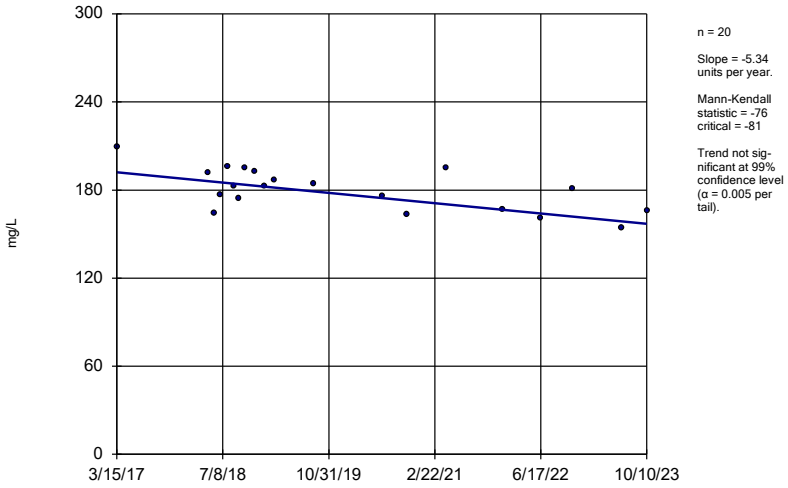
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-4D



n = 20

Slope = -5.34 units per year.

Mann-Kendall statistic = -76 critical = -81

Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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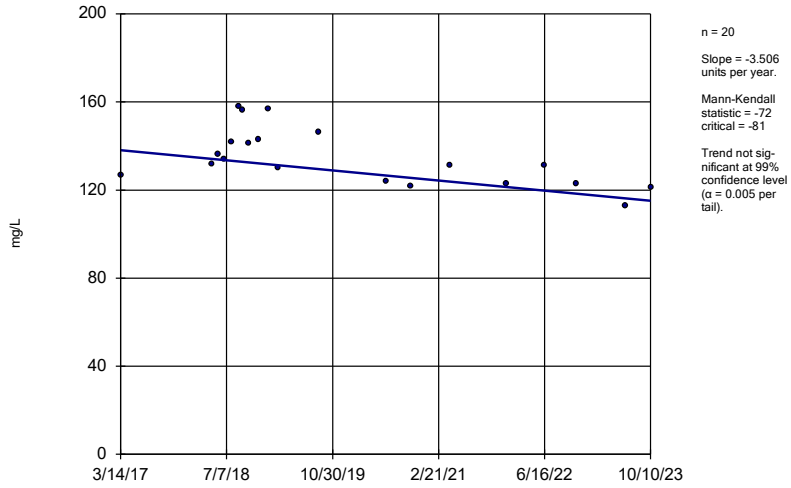
Sen's Slope Estimator

MW-5D



n = 20

Slope = -3.506 units per year.

Mann-Kendall statistic = -72 critical = -81

Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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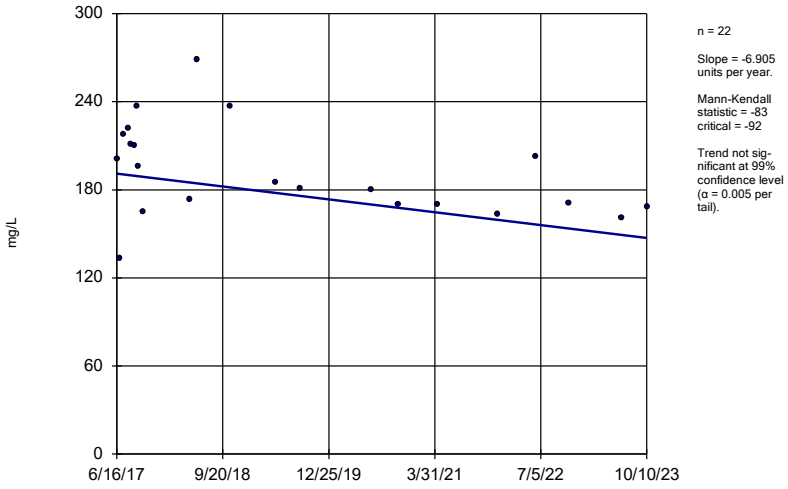
Sen's Slope Estimator

MW-6D



n = 22

Slope = -6.905 units per year.

Mann-Kendall statistic = -83 critical = -92

Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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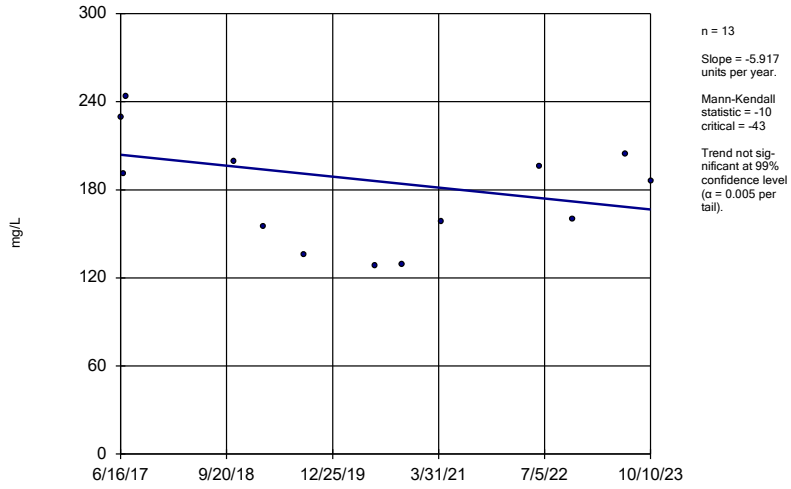
Sen's Slope Estimator

MW-9D



n = 13

Slope = -5.917 units per year.

Mann-Kendall statistic = -10 critical = -43

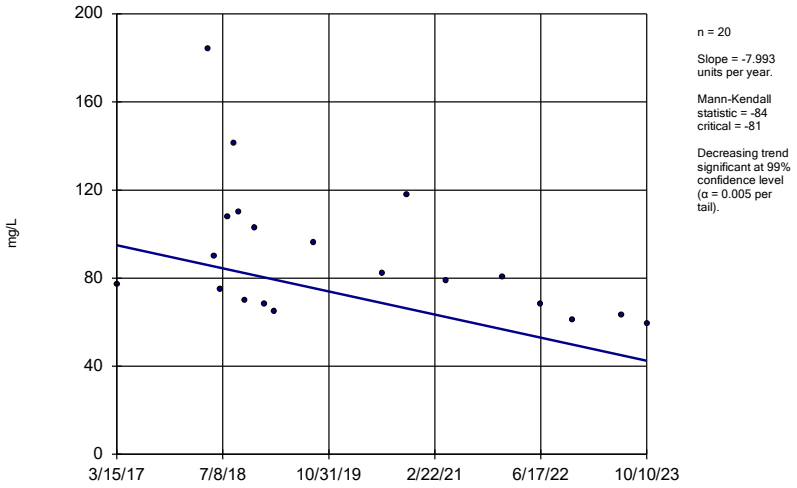
Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-12D



n = 20

Slope = -7.993 units per year.

Mann-Kendall statistic = -84 critical = -81

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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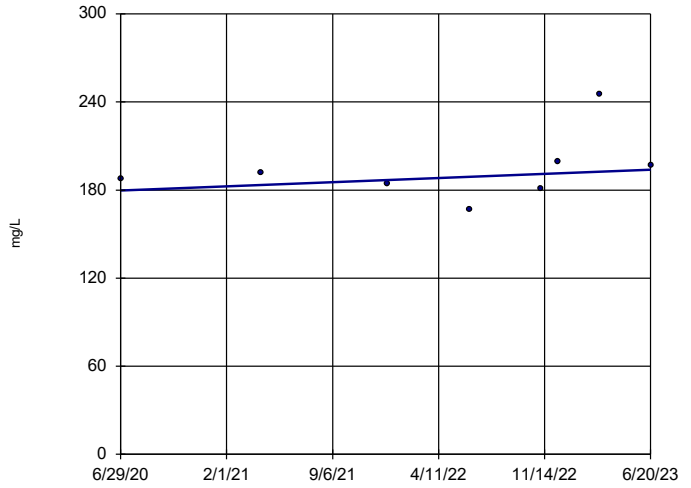
Sen's Slope Estimator

MW-13D



n = 8

Slope = 4.775 units per year.

Mann-Kendall statistic = 8 critical = 21

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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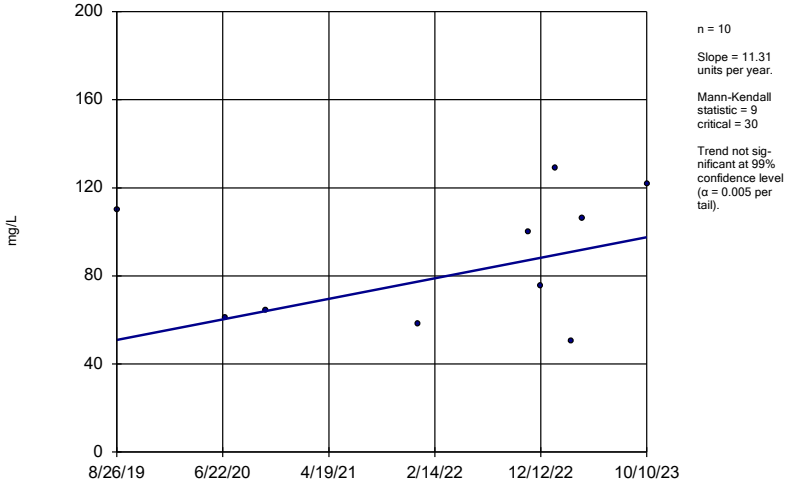
Sen's Slope Estimator

MW-14



n = 10

Slope = 11.31 units per year.

Mann-Kendall statistic = 9 critical = 30

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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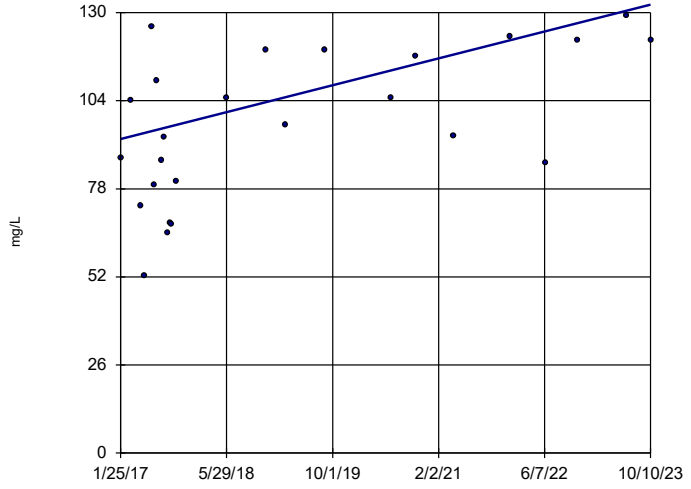
Sen's Slope Estimator

MW-15



n = 25

Slope = 5.908 units per year.

Mann-Kendall statistic = 113 critical = 111

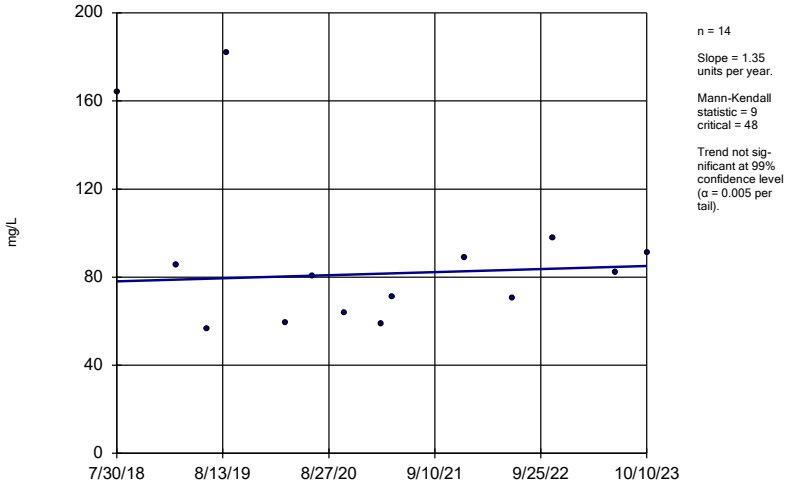
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-4 (bg)



n = 14

Slope = 1.35 units per year.

Mann-Kendall statistic = 9 critical = 48

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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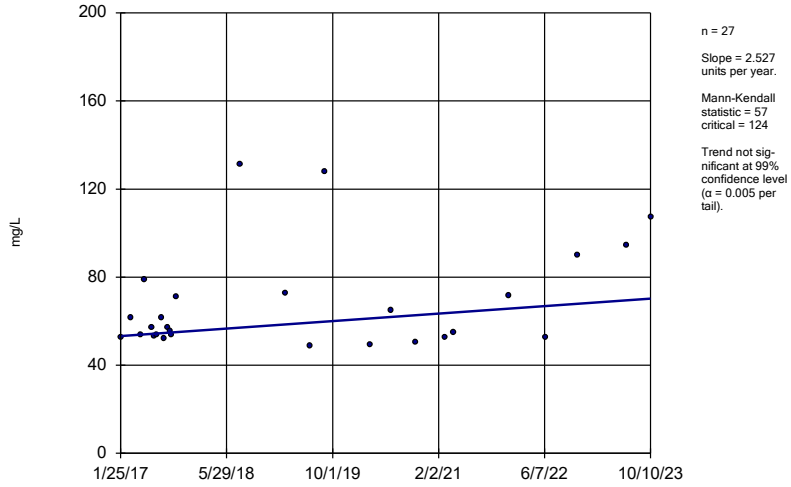
Sen's Slope Estimator

SP-5R (bg)



n = 27

Slope = 2.527 units per year.

Mann-Kendall statistic = 57 critical = 124

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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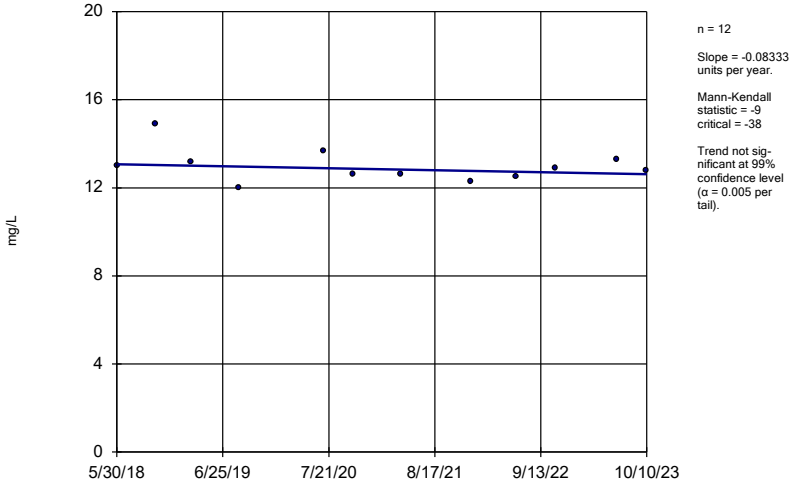
Sen's Slope Estimator

MW-3D



n = 12

Slope = -0.08333 units per year.

Mann-Kendall statistic = -9 critical = -38

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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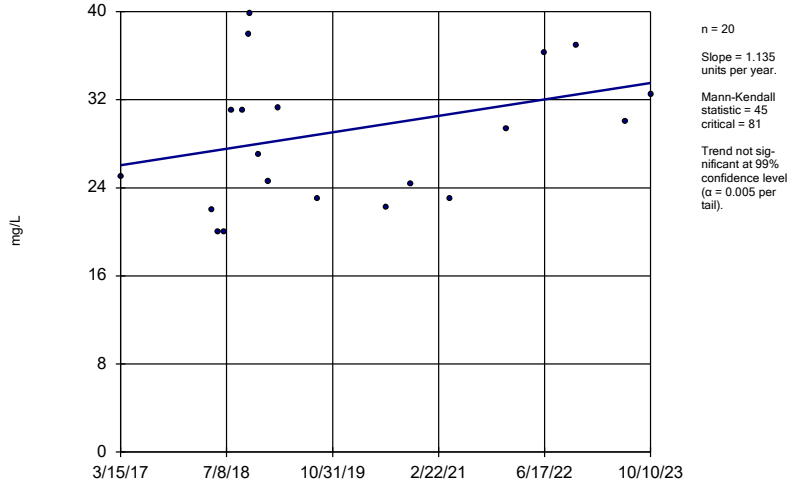
Sen's Slope Estimator

MW-4D



n = 20

Slope = 1.135 units per year.

Mann-Kendall statistic = 45 critical = 81

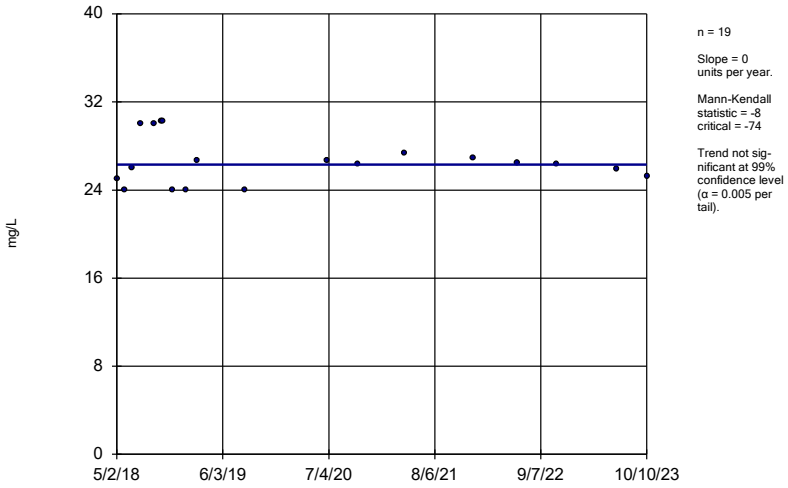
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-5D



n = 19

Slope = 0 units per year.

Mann-Kendall statistic = -8
critical = -74

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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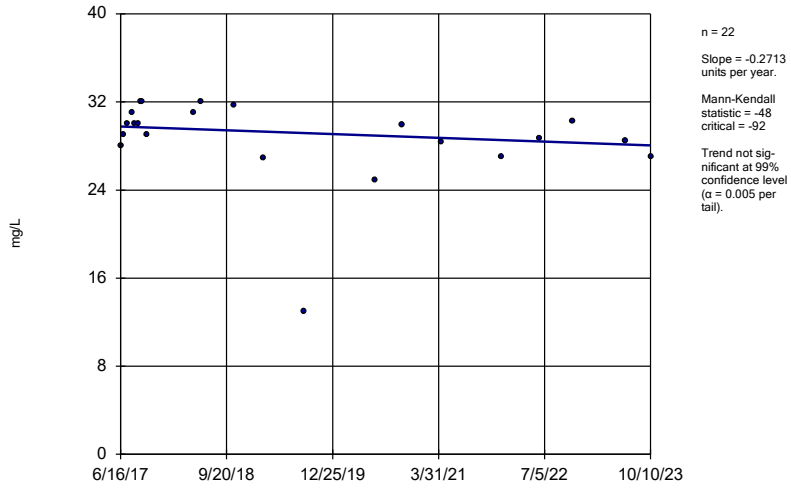
Sen's Slope Estimator

MW-6D



n = 22

Slope = -0.2713 units per year.

Mann-Kendall statistic = -48
critical = -92

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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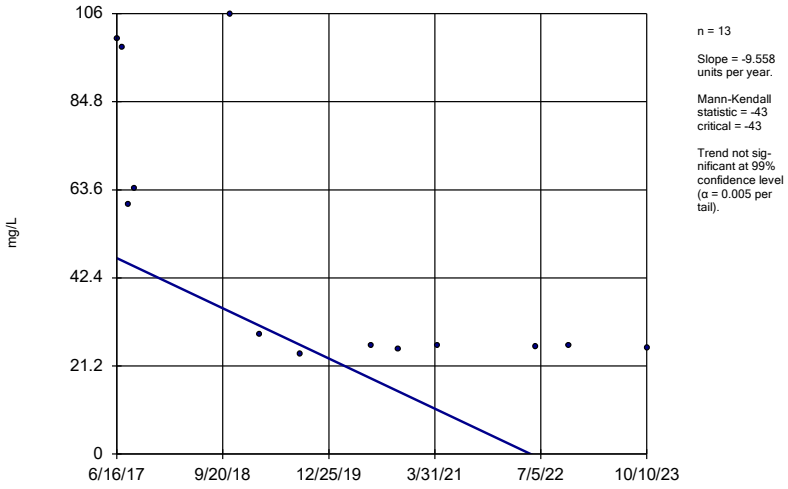
Sen's Slope Estimator

MW-9D



n = 13

Slope = -9.558 units per year.

Mann-Kendall statistic = -43
critical = -43

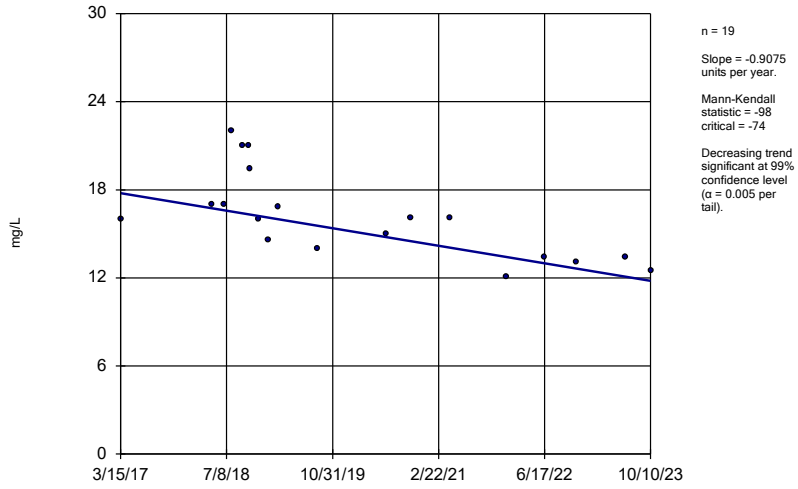
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-12D



n = 19

Slope = -0.9075 units per year.

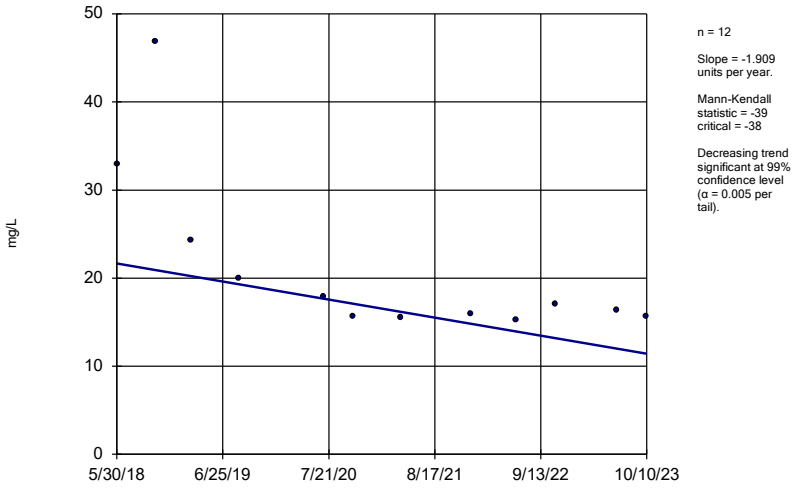
Mann-Kendall statistic = -98
critical = -74

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-15



n = 12

Slope = -1.909 units per year.

Mann-Kendall statistic = -39 critical = -38

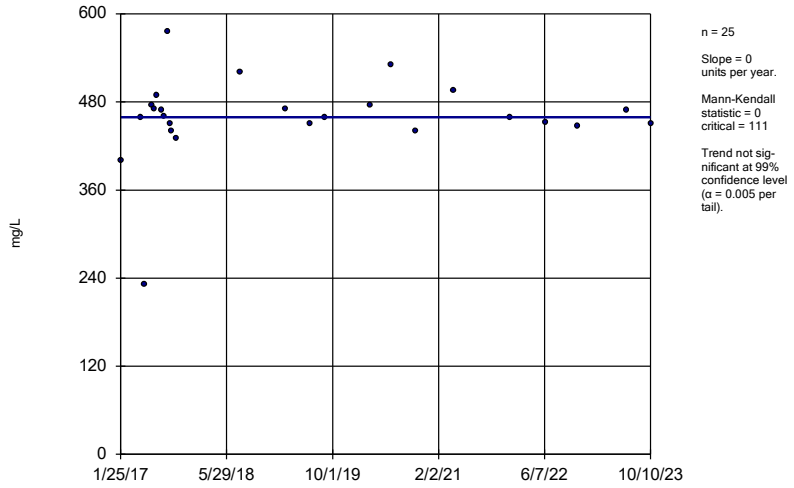
Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-4 (bg)



n = 25

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 111

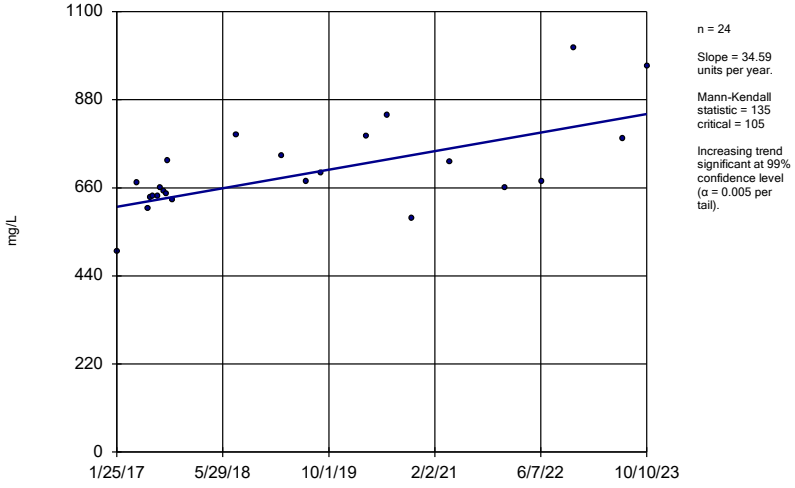
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-5R (bg)



n = 24

Slope = 34.59 units per year.

Mann-Kendall statistic = 135 critical = 105

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

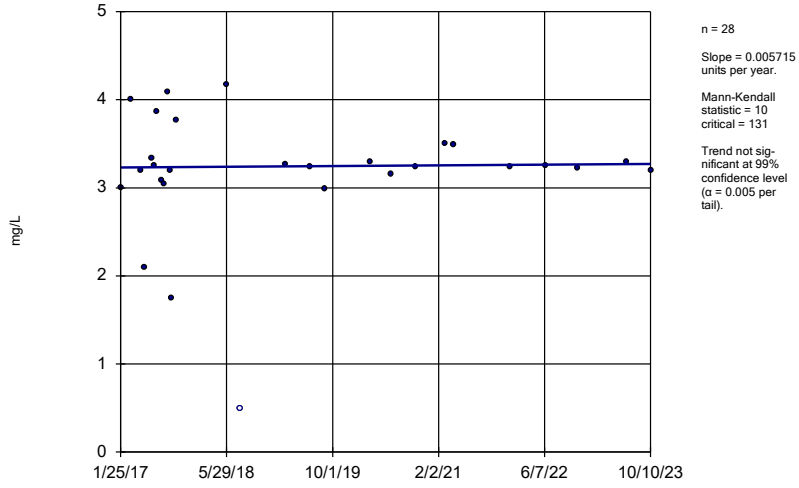
Constituent: Chloride Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

Sen's Slope Estimator

SP-4 (bg)



n = 28

Slope = 0.005715 units per year.

Mann-Kendall statistic = 10 critical = 131

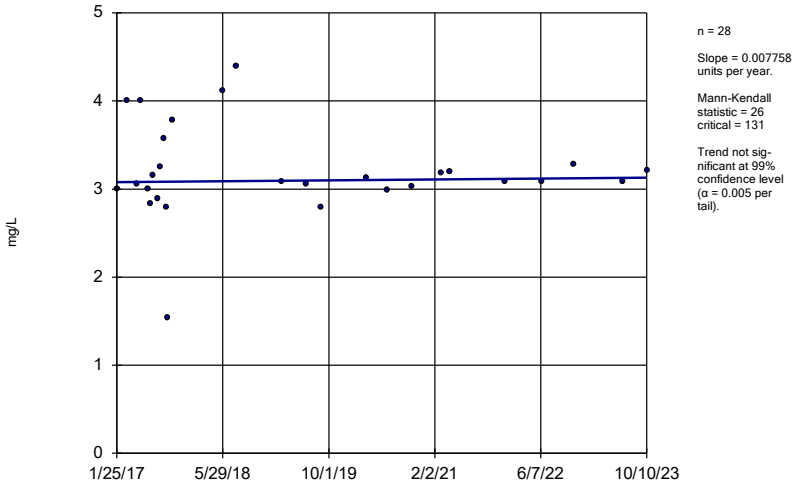
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-5R (bg)



n = 28

Slope = 0.007758 units per year.

Mann-Kendall statistic = 26 critical = 131

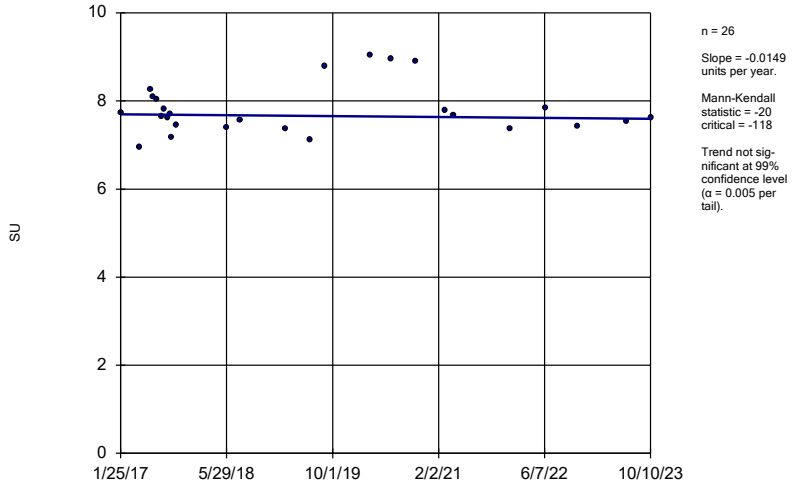
Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: Fluoride Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-4 (bg)



n = 26

Slope = -0.0149 units per year.

Mann-Kendall statistic = -20 critical = -118

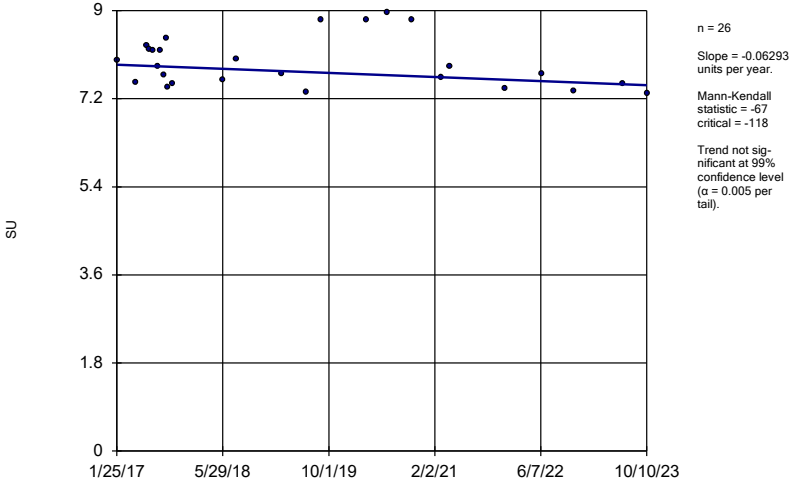
Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: pH, field Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-5R (bg)



n = 26

Slope = -0.06293 units per year.

Mann-Kendall statistic = -67 critical = -118

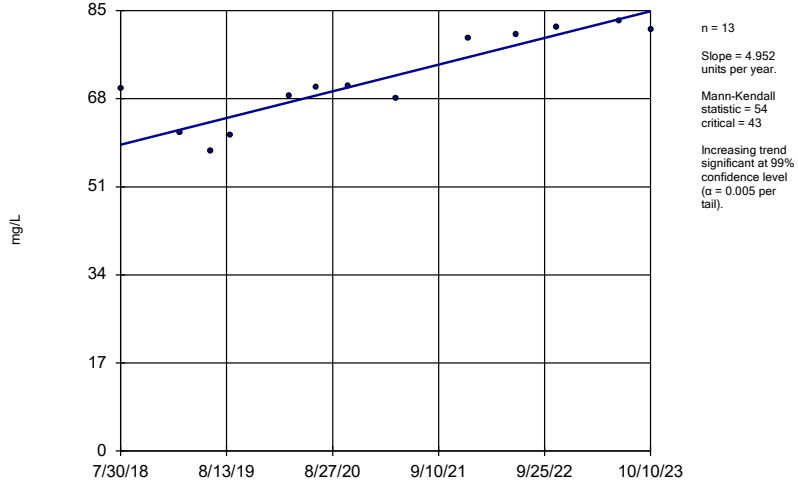
Trend not sig-nificant at 99% confidence level (α = 0.005 per tail).

Constituent: pH, field Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-4 (bg)



n = 13

Slope = 4.952 units per year.

Mann-Kendall statistic = 54 critical = 43

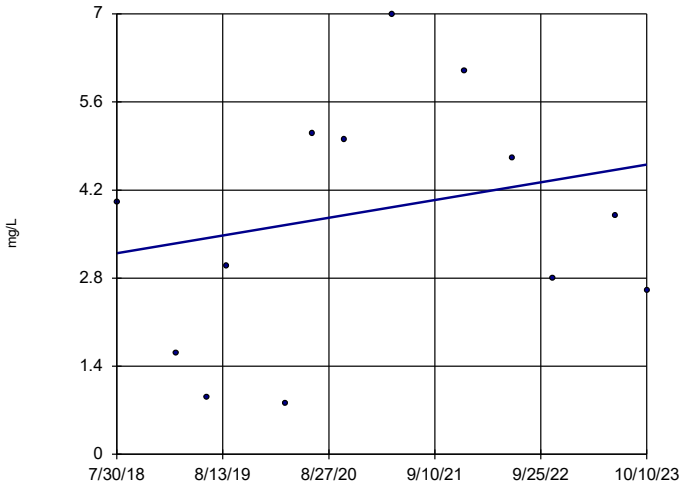
Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-5R (bg)



n = 13

Slope = 0.2705 units per year.

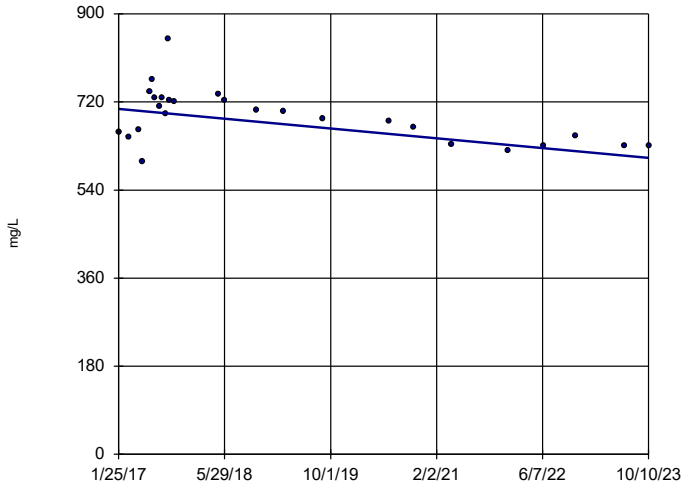
Mann-Kendall statistic = 6
critical = 43

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Sulfate Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-3D



n = 26

Slope = -14.93 units per year.

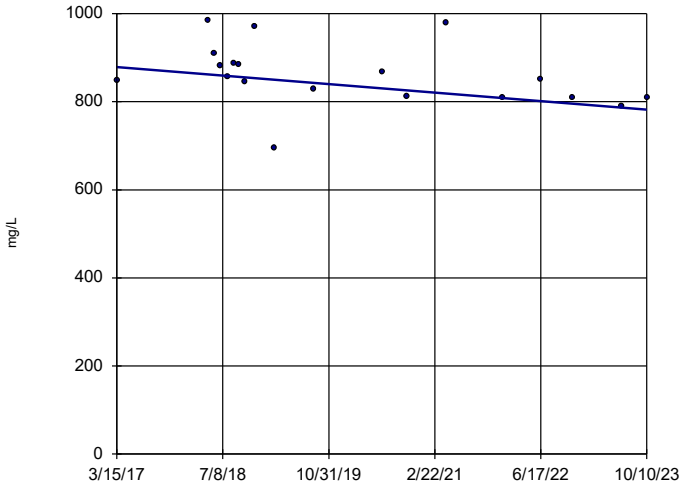
Mann-Kendall statistic = -116
critical = -118

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-4D



n = 19

Slope = -14.7 units per year.

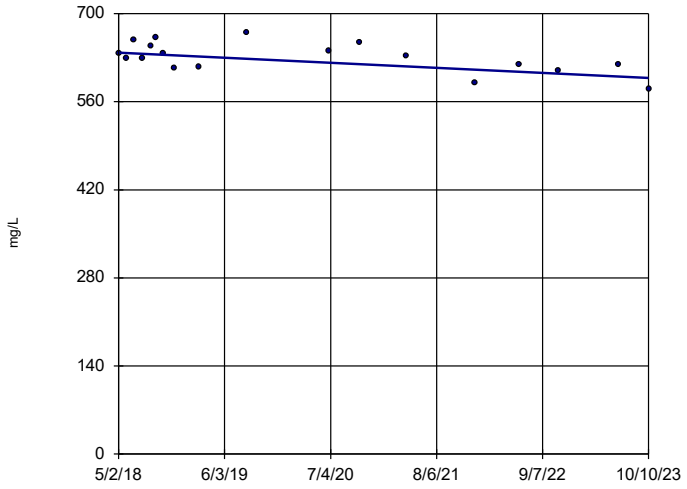
Mann-Kendall statistic = -74
critical = -74

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-5D



n = 18

Slope = -7.384 units per year.

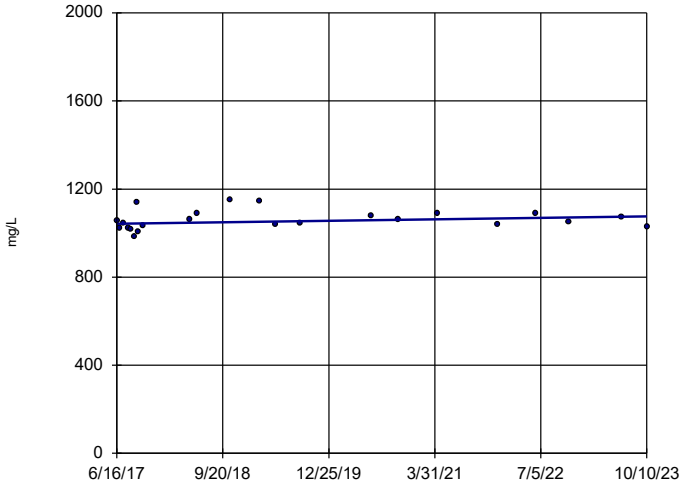
Mann-Kendall statistic = -54
critical = -68

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

MW-6D



n = 23

Slope = 5.32 units per year.

Mann-Kendall statistic = 49 critical = 98

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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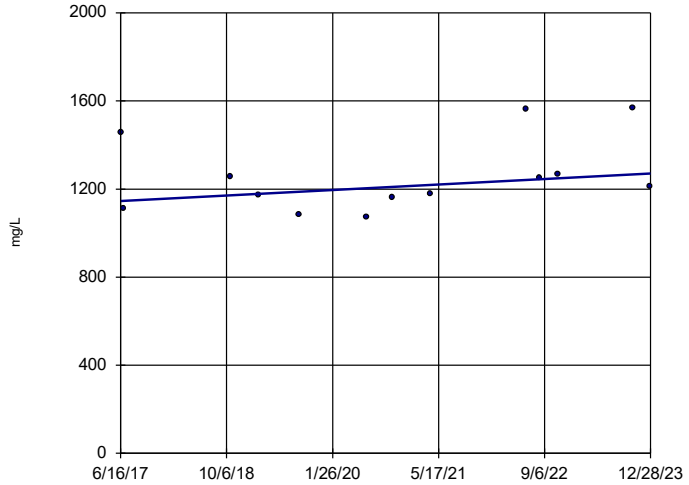
Sen's Slope Estimator

MW-9D



n = 13

Slope = 19.07 units per year.

Mann-Kendall statistic = 20 critical = 43

Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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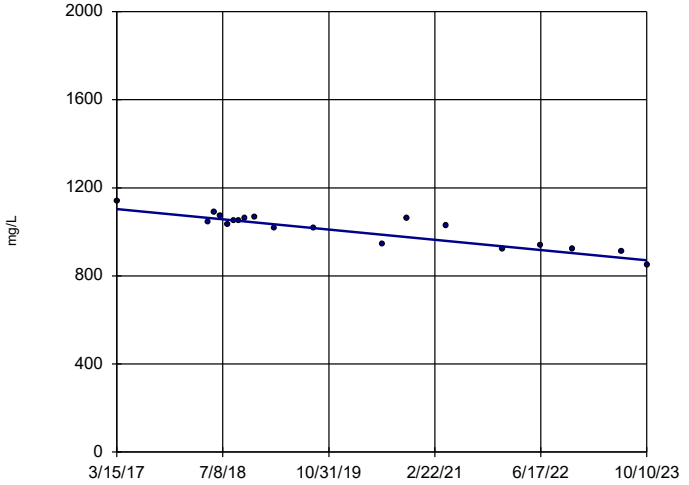
Sen's Slope Estimator

MW-12D



n = 19

Slope = -35.18 units per year.

Mann-Kendall statistic = -113 critical = -74

Decreasing trend significant at 99% confidence level (α = 0.005 per tail).

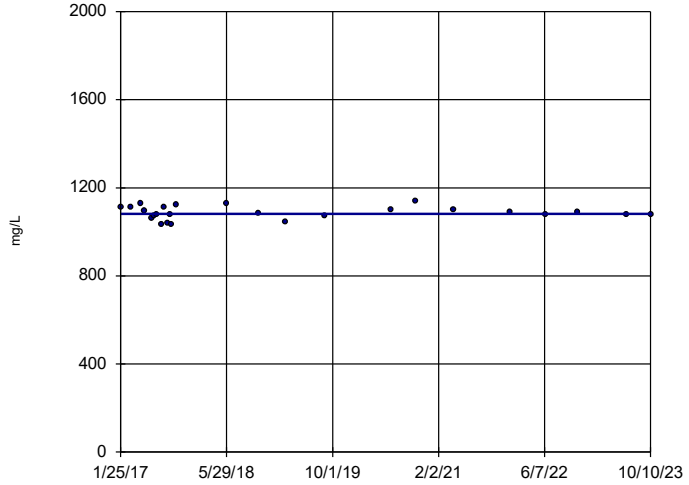
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

MW-15



n = 25

Slope = 0 units per year.

Mann-Kendall statistic = -9 critical = -111

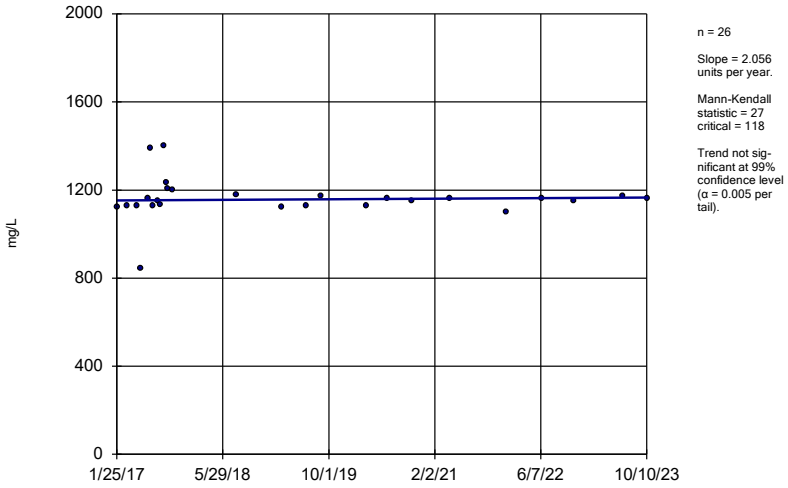
Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator

SP-4 (bg)



n = 26

Slope = 2.056 units per year.

Mann-Kendall statistic = 27
critical = 118

Trend not significant at 99% confidence level (α = 0.005 per tail).

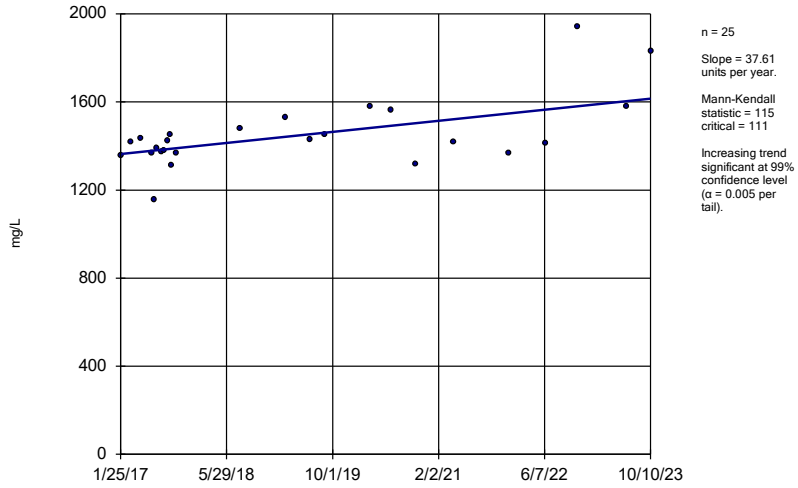
Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Sen's Slope Estimator

SP-5R (bg)



n = 25

Slope = 37.61 units per year.

Mann-Kendall statistic = 115
critical = 111

Increasing trend significant at 99% confidence level (α = 0.005 per tail).

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:53 PM View: Trend Tests

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE J

Intrawell PLs

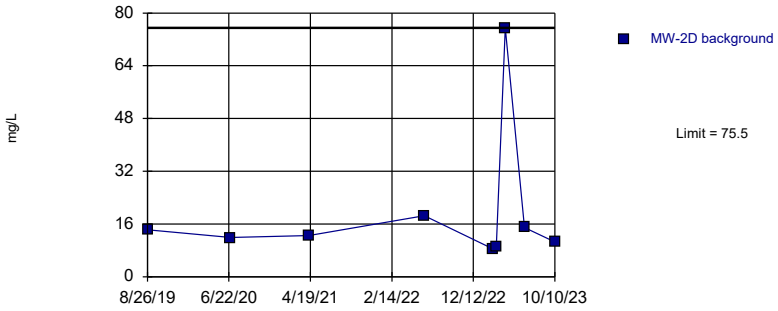
Intrawell Prediction Limits - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 12/2/2024, 5:01 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Calcium (mg/L)	MW-2D	75.5	n/a	n/a	1 future	n/a	9	n/a	n/a	0	n/a	n/a	0.01809	NP Intra (normality) 1 of 2
Calcium (mg/L)	MW-3D	171.6	n/a	n/a	1 future	n/a	26	11.37	0.7931	0	None	sqrt(x)	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-4D	212.8	n/a	n/a	1 future	n/a	20	180	14.42	0	None	No	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-5D	163.6	n/a	n/a	1 future	n/a	20	134.5	12.79	0	None	No	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-6D	263	n/a	n/a	1 future	n/a	22	192	31.72	0	None	No	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-9D	272.6	n/a	n/a	1 future	n/a	13	178.1	37.14	0	None	No	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-12D	163.5	n/a	n/a	1 future	n/a	20	9.369	1.504	0	None	sqrt(x)	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-13D	269.2	n/a	n/a	1 future	n/a	8	13.91	0.796	0	None	sqrt(x)	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-14	168.4	n/a	n/a	1 future	n/a	10	87.61	28.95	0	None	No	0.0007523	Param Intra 1 of 2
Calcium (mg/L)	MW-15	145.7	n/a	n/a	1 future	n/a	25	97.14	22.17	0	None	No	0.0007523	Param Intra 1 of 2
Chloride (mg/L)	MW-3D	14.95	n/a	n/a	1 future	n/a	12	12.98	0.7567	0	None	No	0.0007523	Param Intra 1 of 2
Chloride (mg/L)	MW-4D	42.35	n/a	n/a	1 future	n/a	20	28.36	6.157	0	None	No	0.0007523	Param Intra 1 of 2
Chloride (mg/L)	MW-5D	30.3	n/a	n/a	1 future	n/a	19	n/a	n/a	0	n/a	n/a	0.004832	NP Intra (normality) 1 of 2
Chloride (mg/L)	MW-6D	33.62	n/a	n/a	1 future	n/a	22	730843	244144	0	None	x^4	0.0007523	Param Intra 1 of 2
Chloride (mg/L)	MW-9D	106	n/a	n/a	1 future	n/a	13	n/a	n/a	0	n/a	n/a	0.009692	NP Intra (normality) 1 of 2
Chloride (mg/L)	MW-12D	22.92	n/a	n/a	1 future	n/a	19	16.13	2.949	0	None	No	0.0007523	Param Intra 1 of 2
Chloride (mg/L)	MW-15	46.81	n/a	n/a	1 future	n/a	12	n/a	n/a	0	n/a	n/a	0.01077	NP Intra (normality) 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-3D	809.1	n/a	n/a	1 future	n/a	26	689.2	55.02	0	None	No	0.0007523	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-4D	1021	n/a	n/a	1 future	n/a	19	859.1	70.4	0	None	No	0.0007523	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-5D	685.9	n/a	n/a	1 future	n/a	18	630.2	23.9	0	None	No	0.0007523	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-6D	1156	n/a	n/a	1 future	n/a	23	1059	43.27	0	None	No	0.0007523	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-9D	1706	n/a	n/a	1 future	n/a	13	35.4	2.318	0	None	sqrt(x)	0.0007523	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-12D	1184	n/a	n/a	1 future	n/a	19	1011	75.06	0	None	No	0.0007523	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-15	1151	n/a	n/a	1 future	n/a	25	1086	29.45	0	None	No	0.0007523	Param Intra 1 of 2

Prediction Limit

Intrawell Non-parametric, MW-2D

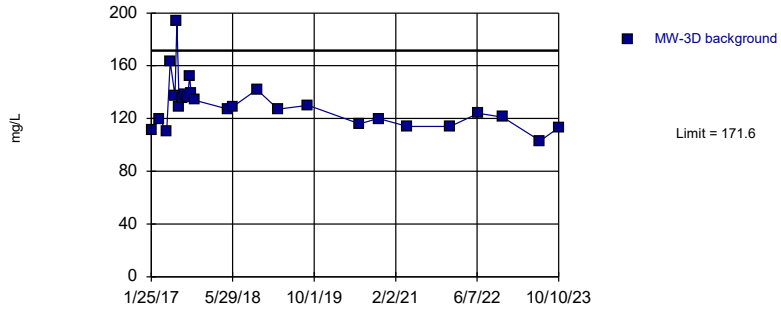


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.1 alpha level. Limit is highest of 9 background values. Well-constituent pair annual alpha = 0.03586. Individual comparison alpha = 0.01809 (1 of 2). Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-3D

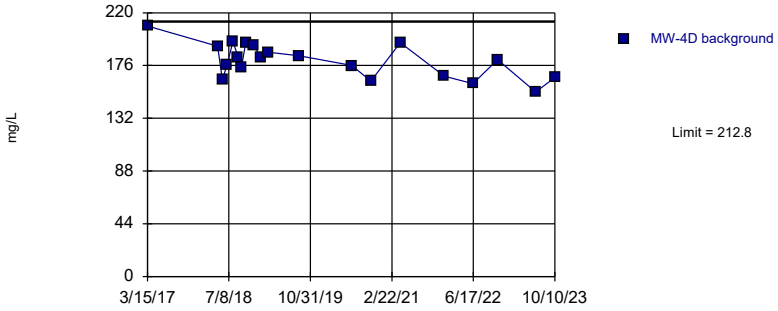


Background Data Summary (based on square root transformation): Mean=11.37, Std. Dev.=0.7931, n=26. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9059, critical = 0.891. Kappa = 2.18 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-4D

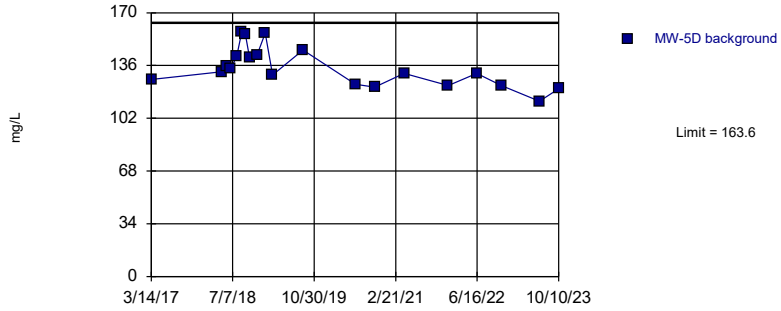


Background Data Summary: Mean=180, Std. Dev.=14.42, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9727, critical = 0.868. Kappa = 2.273 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-5D

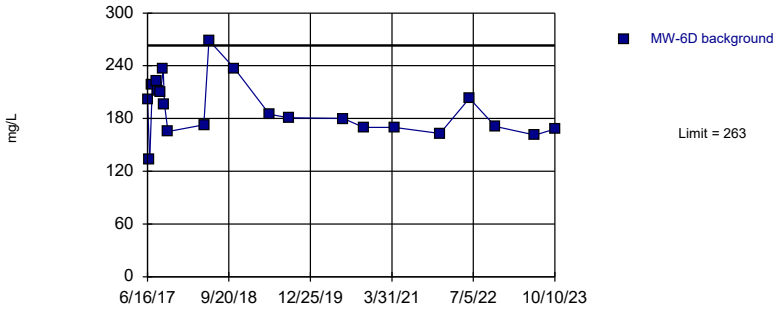


Background Data Summary: Mean=134.5, Std. Dev.=12.79, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9427, critical = 0.868. Kappa = 2.273 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-6D



Background Data Summary: Mean=192, Std. Dev.=31.72, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9556, critical = 0.878. Kappa = 2.24 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

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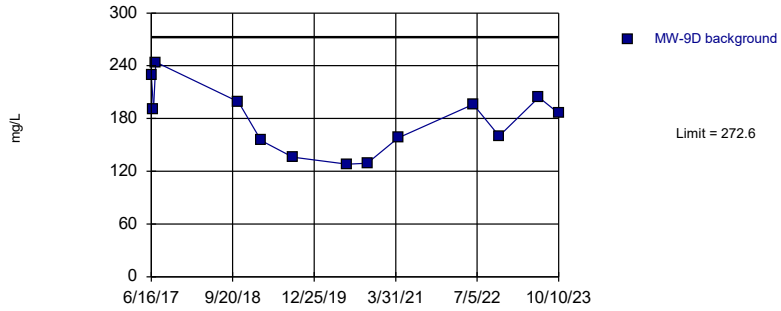
Prediction Limit

Intrawell Parametric, MW-9D



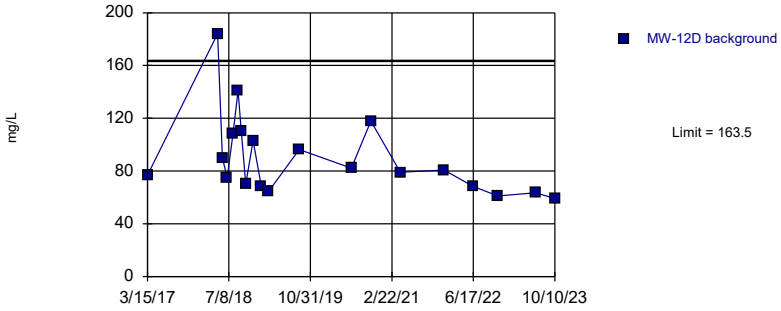
Background Data Summary: Mean=178.1, Std. Dev.=37.14, n=13. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9468, critical = 0.866. Kappa = 2.546 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Prediction Limit

Intrawell Parametric, MW-12D



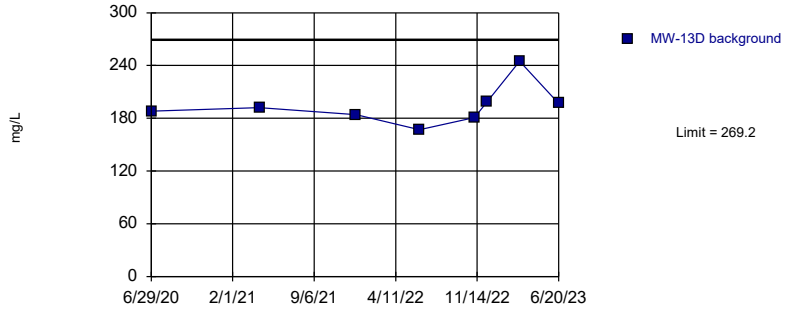
Background Data Summary (based on square root transformation): Mean=9.369, Std. Dev.=1.504, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8848, critical = 0.868. Kappa = 2.273 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Sanitas™ v.10.0.23a Software licensed to Groundwater Stats Consulting. UG

Prediction Limit

Intrawell Parametric, MW-13D

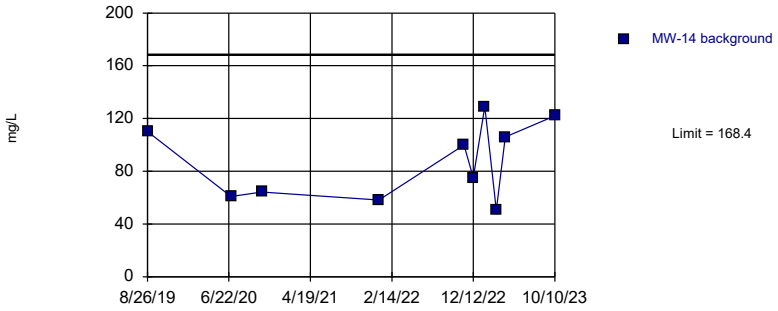


Background Data Summary (based on square root transformation): Mean=13.91, Std. Dev.=0.796, n=8. Normality test: Shapiro Wilk @alpha = 0.1, calculated = 0.8564, critical = 0.851. Kappa = 3.133 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-14

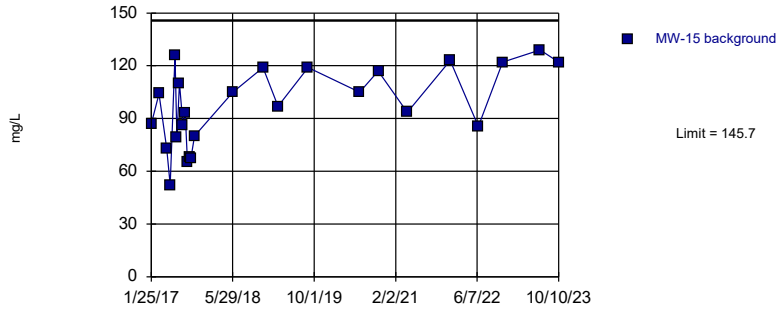


Background Data Summary: Mean=87.61, Std. Dev.=28.95, n=10. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9059, critical = 0.842. Kappa = 2.789 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-15

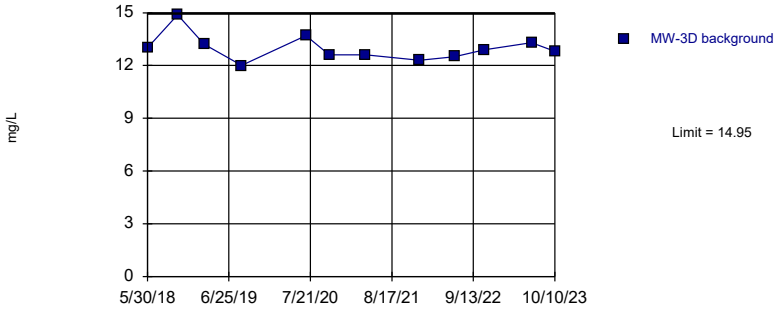


Background Data Summary: Mean=97.14, Std. Dev.=22.17, n=25. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9467, critical = 0.888. Kappa = 2.19 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Calcium Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-3D

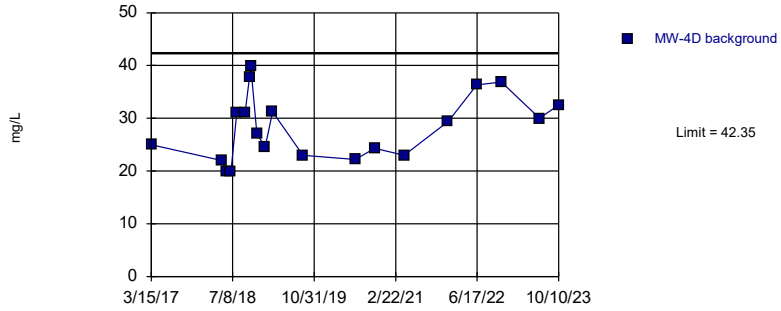


Background Data Summary: Mean=12.98, Std. Dev.=0.7567, n=12. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8922, critical = 0.859. Kappa = 2.599 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-4D

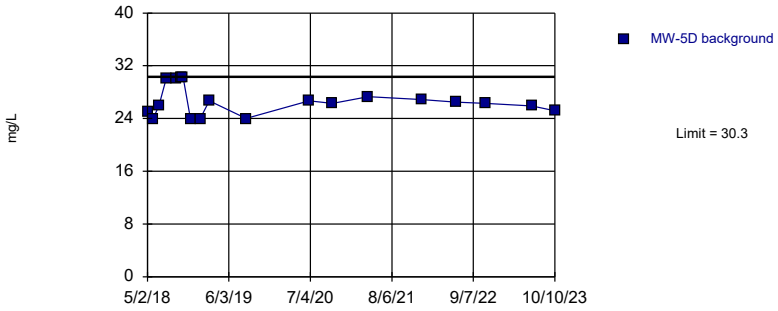


Background Data Summary: Mean=28.36, Std. Dev.=6.157, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9355, critical = 0.868. Kappa = 2.273 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Non-parametric, MW-5D

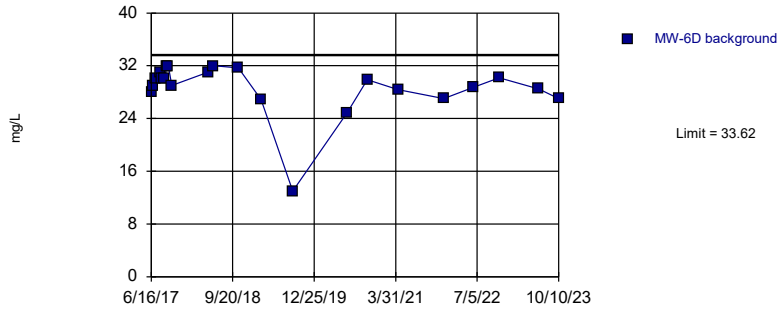


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 19 background values. Well-constituent pair annual alpha = 0.009641. Individual comparison alpha = 0.004832 (1 of 2). Assumes 1 future value.

Constituent: Chloride Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-6D

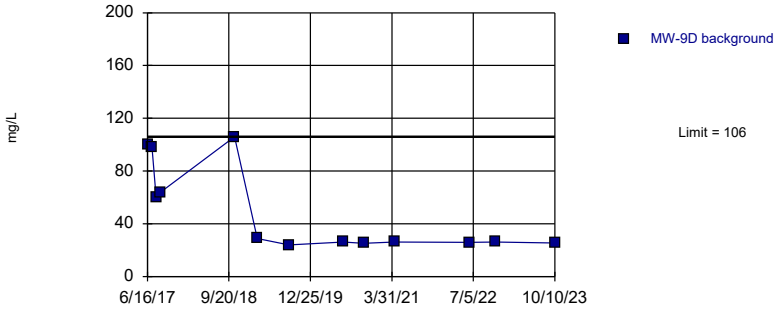


Background Data Summary (based on x^4 transformation): Mean=730843, Std. Dev.=244144, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9232, critical = 0.878. Kappa = 2.24 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Non-parametric, MW-9D

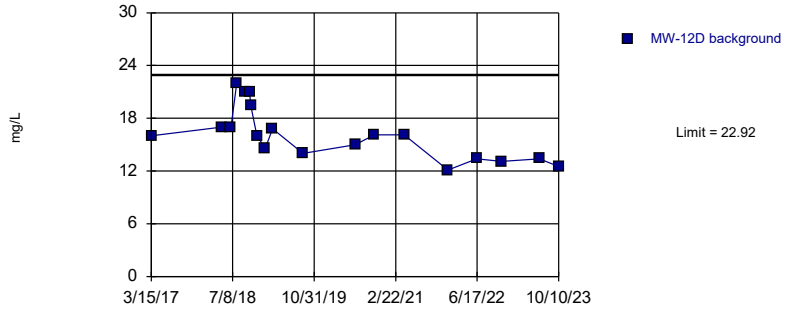


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 13 background values. Well-constituent pair annual alpha = 0.01929. Individual comparison alpha = 0.009692 (1 of 2). Assumes 1 future value.

Constituent: Chloride Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-12D

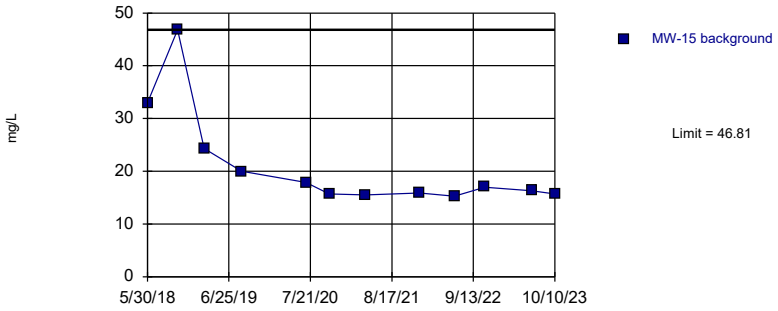


Background Data Summary: Mean=16.13, Std. Dev.=2.949, n=19. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9234, critical = 0.901. Kappa = 2.301 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Chloride Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Non-parametric, MW-15

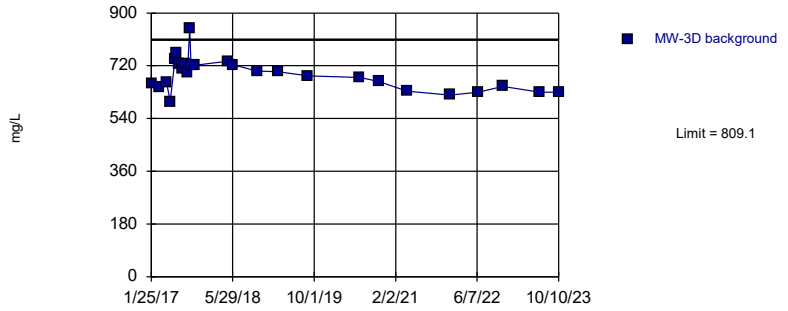


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 12 background values. Well-constituent pair annual alpha = 0.02143. Individual comparison alpha = 0.01077 (1 of 2). Assumes 1 future value.

Constituent: Chloride Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-3D

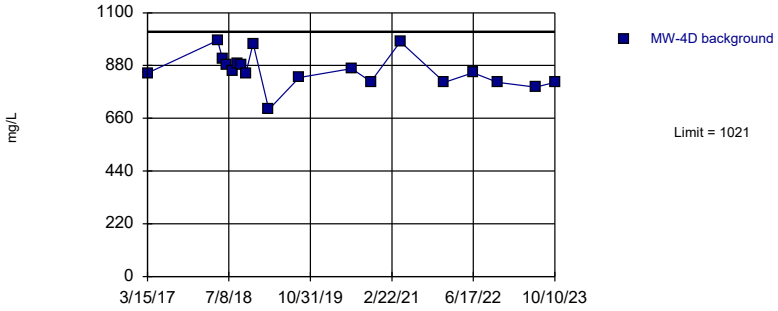


Background Data Summary: Mean=689.2, Std. Dev.=55.02, n=26. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9479, critical = 0.891. Kappa = 2.18 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limit
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-4D

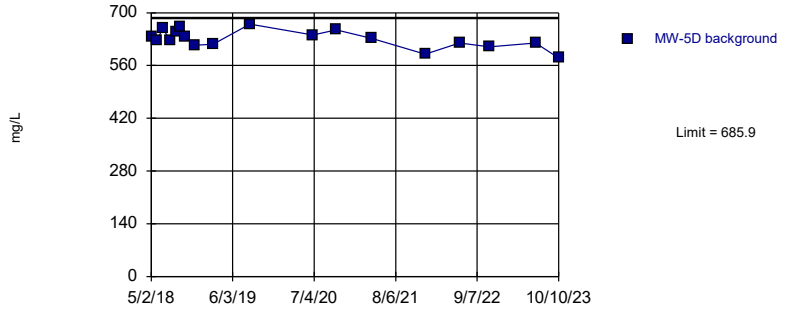


Background Data Summary: Mean=859.1, Std. Dev.=70.4, n=19. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9395, critical = 0.901. Kappa = 2.301 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limit
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-5D

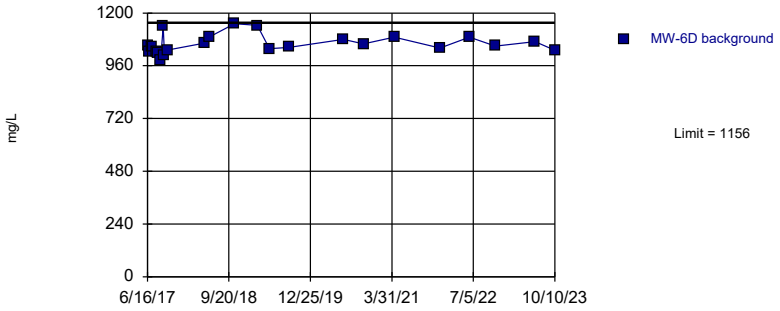


Background Data Summary: Mean=630.2, Std. Dev.=23.9, n=18. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9758, critical = 0.897. Kappa = 2.33 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limit
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-6D

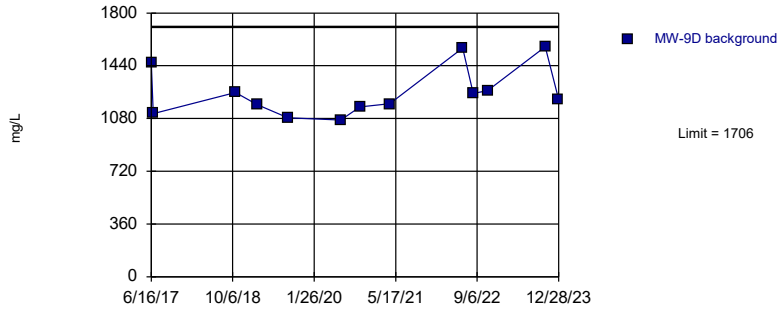


Background Data Summary: Mean=1059, Std. Dev.=43.27, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9344, critical = 0.881. Kappa = 2.223 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limit
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-9D

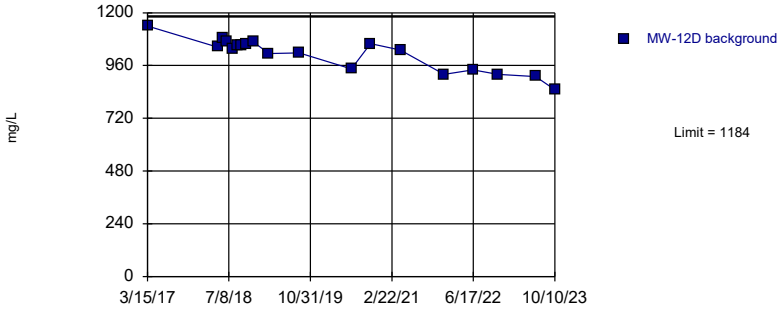


Background Data Summary (based on square root transformation): Mean=35.4, Std. Dev.=2.318, n=13. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8739, critical = 0.866. Kappa = 2.546 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limit
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-12D

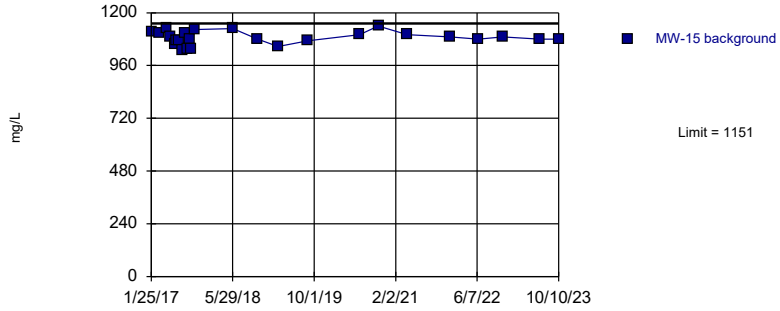


Background Data Summary: Mean=1011, Std. Dev.=75.06, n=19. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9237, critical = 0.901. Kappa = 2.301 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limit
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Intrawell Parametric, MW-15



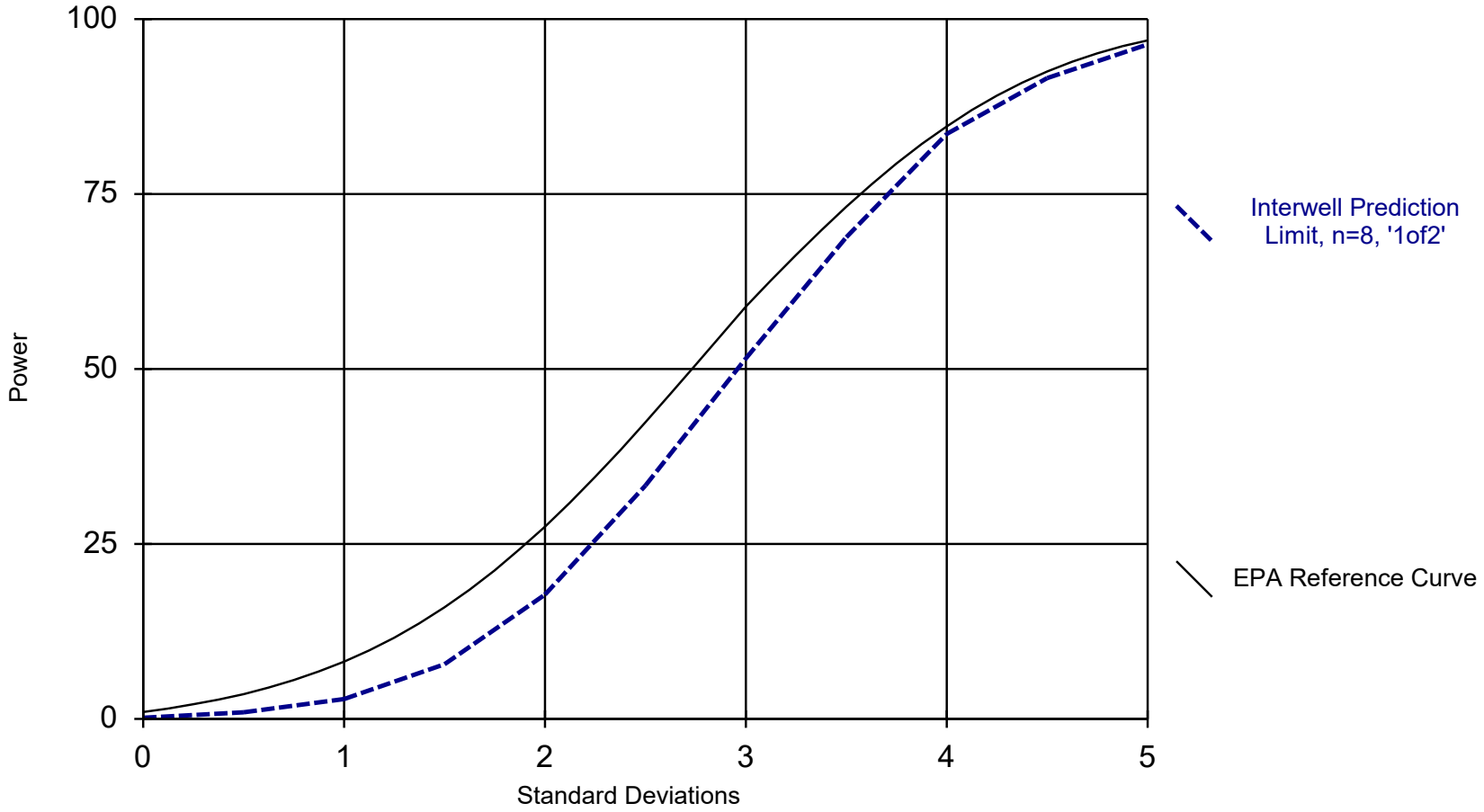
Background Data Summary: Mean=1086, Std. Dev.=29.45, n=25. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9633, critical = 0.888. Kappa = 2.19 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.0007523. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 12/2/2024 4:59 PM View: Intrawell Prediction Limit
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

FIGURE K

Interwell PLs

Intrawell Power Curve



Kappa = 2.993, based on 10 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 12/4/2024 8:54 AM

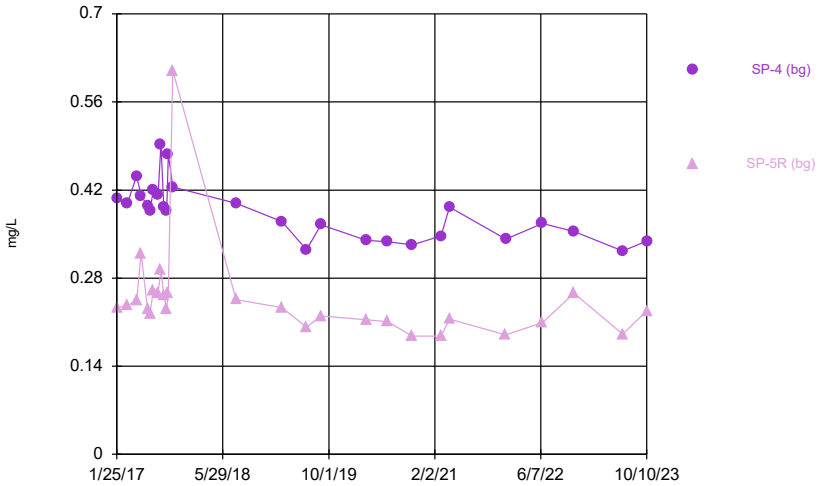
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Interwell Prediction Limits - All Results

Northeastern Landfill Client: Geosyntec Data: Northeastern LF Printed 11/26/2024, 11:42 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	n/a	0.5227	n/a	n/a	10 future	n/a	54	0.5554	0.08286	0	None	sqrt(x)	0.0007523	Param Inter 1 of 2
Fluoride (mg/L)	n/a	4.39	n/a	n/a	10 future	n/a	56	n/a	n/a	1.786	n/a	n/a	0.0006023	NP Inter (normality) 1 of 2
pH, field (SU)	n/a	9.05	6.96	n/a	10 future	n/a	52	n/a	n/a	0	n/a	n/a	0.001376	NP Inter (normality) 1 of 2
Sulfate (mg/L)	n/a	83	n/a	n/a	10 future	n/a	26	n/a	n/a	0	n/a	n/a	0.002433	NP Inter (normality) 1 of 2

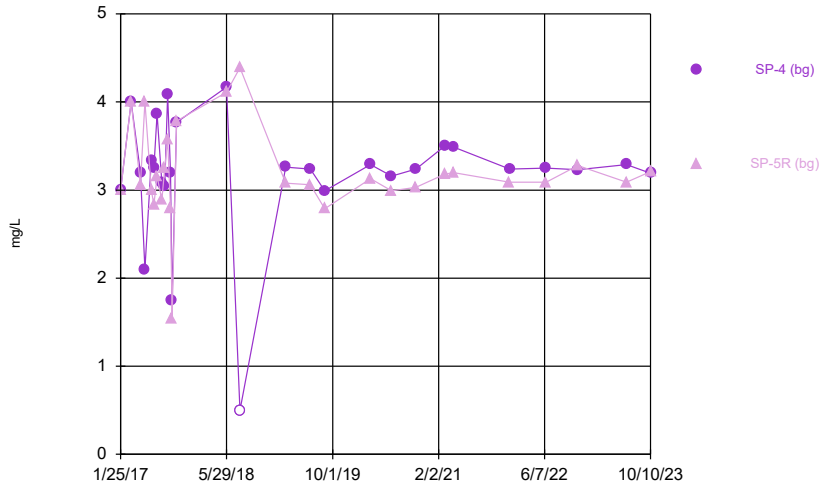
Time Series



Constituent: Boron Analysis Run 11/26/2024 11:41 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

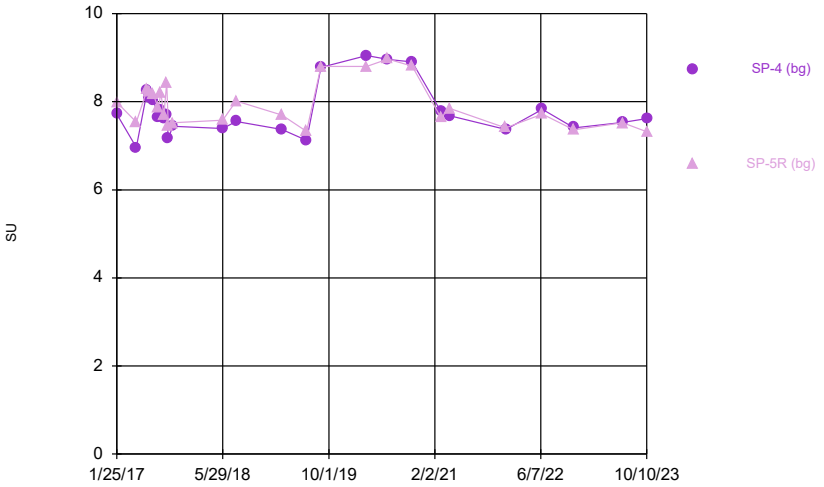
Hollow symbols indicate censored values.

Time Series



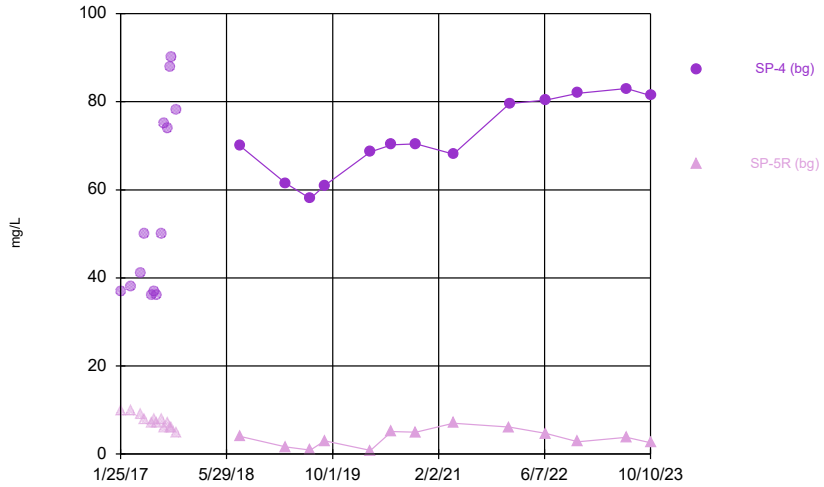
Constituent: Fluoride Analysis Run 11/26/2024 11:41 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Time Series



Constituent: pH, field Analysis Run 11/26/2024 11:41 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

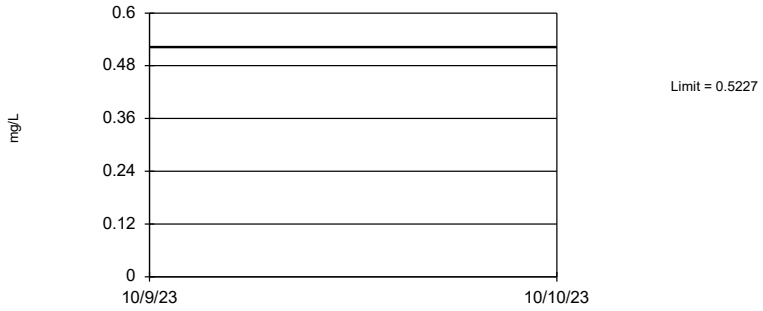
Time Series



Constituent: Sulfate Analysis Run 11/26/2024 11:41 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Interwell Parametric



Background Data Summary (based on square root transformation): Mean=0.5554, Std. Dev.=0.08286, n=54. Normality test: Shapiro Francia @alpha = 0.01, calculated = 0.949, critical = 0.939. Kappa = 2.022 (c=7, w=10, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.0007523. Assumes 10 future values.

Constituent: Boron Analysis Run 11/26/2024 11:42 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

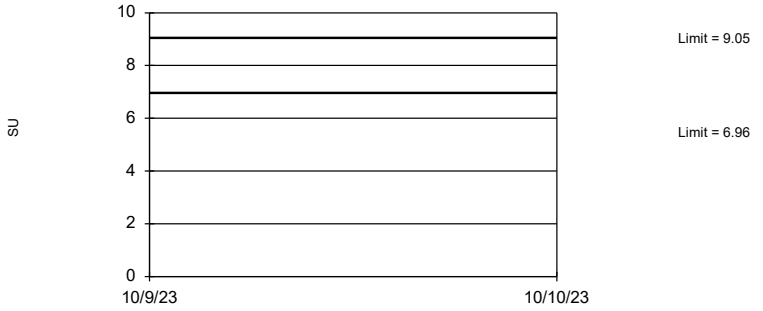
Interwell Non-parametric

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 56 background values. 1.786% NDs. Annual per-constituent alpha = 0.01198. Individual comparison alpha = 0.0006023 (1 of 2). Assumes 10 future values.

Constituent: Fluoride Analysis Run 11/26/2024 11:42 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

Interwell Non-parametric

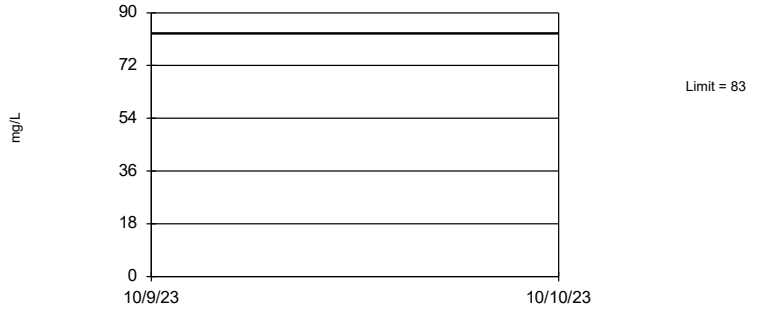


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 52 background values. Annual per-constituent alpha = 0.02733. Individual comparison alpha = 0.001376 (1 of 2). Assumes 10 future values.

Constituent: pH, field Analysis Run 11/26/2024 11:42 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Prediction Limit

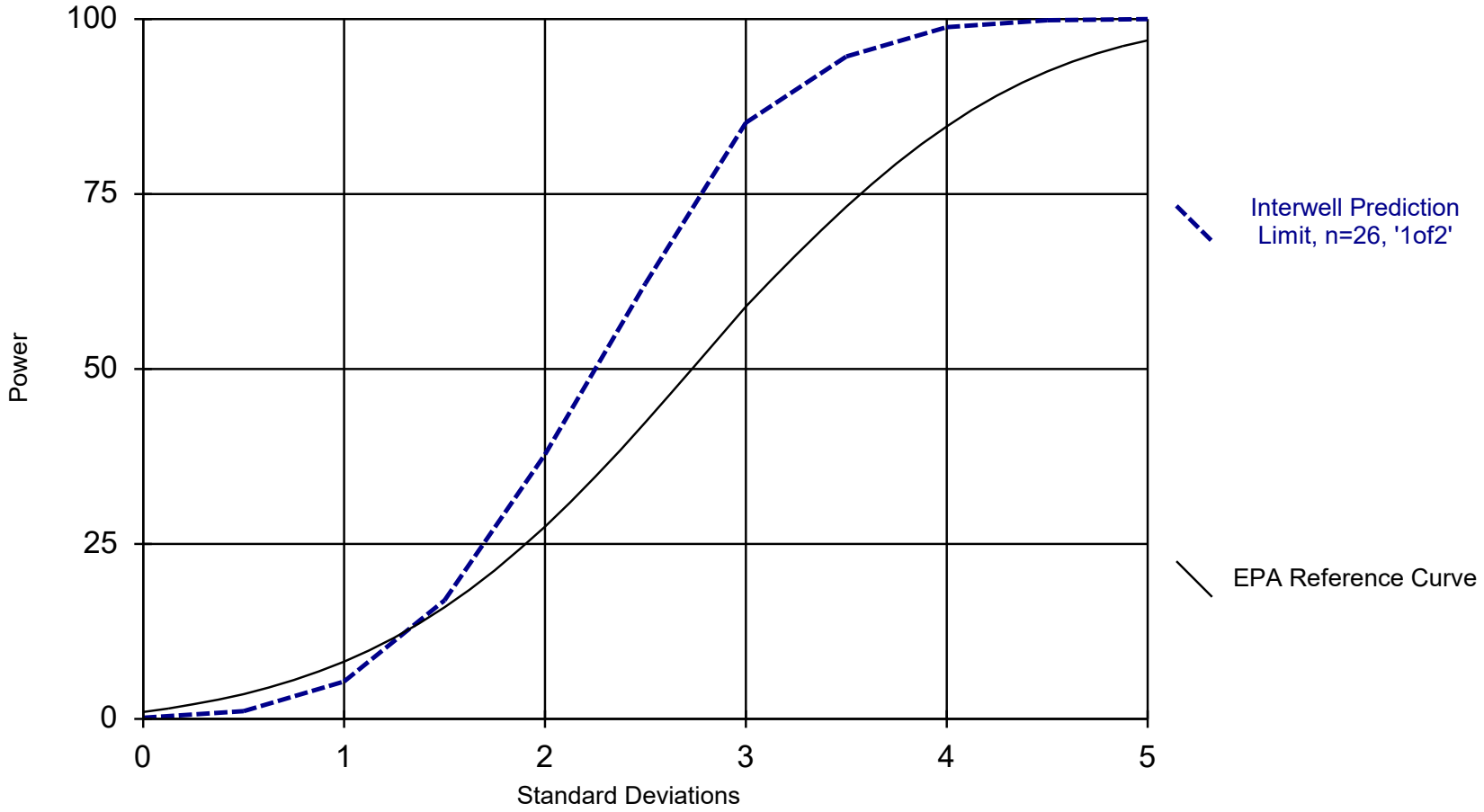
Interwell Non-parametric



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 26 background values. Annual per-constituent alpha = 0.04755. Individual comparison alpha = 0.002433 (1 of 2). Assumes 10 future values.

Constituent: Sulfate Analysis Run 11/26/2024 11:42 AM View: Interwell Prediction Limits
Northeastern Landfill Client: Geosyntec Data: Northeastern LF

Interwell Power Curve



Kappa = 2.169, based on 10 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 11/26/2024 11:53 AM

Northeastern Landfill Client: Geosyntec Data: Northeastern LF

APPENDIX 3

Alternative Source Demonstrations - NA

APPENDIX 4

Notices for Monitoring Program Transitions – NA

APPENDIX 5

Well Installation/Decommissioning Logs – NA

APPENDIX 6

Groundwater monitoring Field and Laboratory Reports

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	NA	Landfill	Slurry Wall	Landfill	Slurry Wall
Depth to Water (ft)	55.20	23.41	56.71	33.41	37.80	22.37
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.05	14.35	5.09	3.34	25.15	4.84
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.50	2.34	0.83	0.54	4.10	0.79
Water Removed From Well (gallons)	0.25	----	2.00	1.25	13.00	1.50
Method of Removal	Pump	----	Pump	Pump	Pump	Pump
Was Well Purged Dry?	Yes	----	Yes	Yes	No	Yes
pH (standard units)	----	----	10.34	8.01	7.54	7.31
Temperature (°C)	----	----	20.86	21.42	22.23	20.73
Conductivity (µmhos/cc)	----	----	1850	2,440	953	3380
Turbidity (NTU)	----	----	15.2	147	7.4	162
Appearance	----	----	Slightly Turbid	Slightly Turbid	Clear	Slightly Turbid
Odor	----	----	None	None	None	None
Containers	250 mL HNO3 1 L Cool 0-6C	----	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	----	----	1718	1713	1557	1606
Sample Date	----	----	4/16/2024	4/16/2024	4/16/2024	4/16/2024

Landfill Dup
1430

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	NA	Landfill	NA	Landfill	Slurry Wall
Depth to Water (ft)	43.80	Dry	25.27	21.11	34.48	Dry
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.06	----	33.15	12.04	24.03	----
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.64	----	5.40	1.96	3.92	----
Water Removed From Well (gallons)	9.00	----	14.25	----	8.25	----
Method of Removal	Pump	----	Pump	----	Pump	----
Was Well Purged Dry?	No	----	Yes	----	Yes	----
pH (standard units)	7.19	----	7.35	----	7.49	----
Temperature (°C)	19.67	----	20.24	----	20.38	----
Conductivity (µmhos/cc)	1,140	----	1100	----	1,500	----
Turbidity (NTU)	19.7	----	5.6	----	124	----
Appearance	Clear	----	Clear	----	Slightly Turbid	----
Odor	None	----	None	----	None	----
Containers	250 mL HNO3 1 L Cool 0-6C	----	250 mL HNO3 1 L Cool 0-6C	----	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	1802	----	1729	----	1621	----
Sample Date	4/16/2024	----	4/16/2024	----	4/16/2024	----

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	NA	NA	NA	NA	Landfill	Slurry Wall
Depth to Water (ft)	11.74	11.79	18.88	7.40	51.03	27.36
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	46.96	21.75	45.62	35.90	12.07	9.35
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	7.65	3.55	7.44	5.85	1.97	1.52
Water Removed From Well (gallons)	----	----	----	----	3.75	3.00
Method of Removal	----	----	----	----	Pump	Pump
Was Well Purged Dry?	----	----	----	----	Yes	Yes
pH (standard units)	----	----	----	----	7.85	11.93
Temperature (°C)	----	----	----	----	19.89	20.41
Conductivity (µmhos/cc)	----	----	----	----	1,710	3,400
Turbidity (NTU)	----	----	----	----	108	30.7
Appearance	----	----	----	----	Turbid	Yellowish
Odor	----	----	----	----	None	Sulphur
Containers	------	------	------	------	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	----	----	----	----	1637	1645
Sample Date	----	----	----	----	4/16/2024	4/16/2024

Slurry Wall Dup
1300

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	NA	Landfill	NA	Landfill	Slurry Wall
Depth to Water (ft)	68.61	21.07	48.48	16.17	16.98	11.93
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.72	15.15	1.86	14.85	27.94	11.01
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.44	2.47	0.30	2.42	4.55	1.79
Water Removed From Well (gallons)	0.25	----	0.25	----	13.00	2.25
Method of Removal	Pump	----	Pump	----	Pump	Pump
Was Well Purged Dry?	----	----	----	----	Yes	Yes
pH (standard units)	----	----	----	----	8.36	6.86
Temperature (°C)	----	----	----	----	20.78	20.91
Conductivity (µmhos/cc)	----	----	----	----	1,220	1,340
Turbidity (NTU)	----	----	----	----	83.6	65.2
Appearance	----	----	----	----	Slightly Turbid	Slightly Turbid
Odor	----	----	----	----	None	Sewage
Containers	250 mL HNO3 1 L Cool 0-6C	------	250 mL HNO3 1 L Cool 0-6C	------	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	----	----	----	----	1438	1434
Sample Date	----	----	----	----	4/16/2024	4/16/2024

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	Slurry Wall	Landfill	Landfill	Landfill	Landfill
Depth to Water (ft)	44.51	13.83	68.59	57.65	62.71	52.19
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	3.05	4.29	10.37	16.56	1.44	6.22
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.50	0.70	1.69	2.70	0.23	1.01
Water Removed From Well (gallons)	1.00	2.25	1.50	4.50	----	0.75
Method of Removal	Pump	Pump	Pump	Pump	----	Pump
Was Well Purged Dry?	Yes	No	Yes	Yes	----	Yes
pH (standard units)	7.24	7.26	7.28	7.94	----	----
Temperature (°C)	21.79	19.82	20.23	20.96	----	----
Conductivity (µmhos/cc)	1,520	1330	9,140	1,430	----	----
Turbidity (NTU)	134	13.2	18.7	21.1	----	----
Appearance	Slightly Turbid	Clear	Clear	Clear	----	----
Odor	None	None	None	None	----	----
Containers	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C
Sample Time	1413	1419	1743	1701	----	----
Sample Date	4/16/2024	4/16/2024	4/16/2024	4/16/2024	----	----

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	MW-18	MW-19				
Activities	Gauge	Gauge				
Samples	Landfill	Landfill				
Depth to Water (ft)	37.25	21.49				
Measured Depth Total Depth of Well (ft.)	93.78	93.80				
Height of Water Column (ft.)	56.53	72.31				
Well Size (I.D.) (inches)	2	2				
Volume of Water in Well (gallons)	9.21	11.79				
Water Removed From Well (gallons)	7.75	16.50				
Method of Removal	Pump	Pump				
Was Well Purged Dry?	Yes	Yes				
pH (standard units)	6.94	7.21				
Temperature (°C)	20.48	20.86				
Conductivity (µmhos/cc)	41,200	38,600				
Turbidity (NTU)	13.7	19.8				
Appearance	Clear	Clear				
Odor	None	Sulphur				
Containers	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C				
Sample Time	1827	1816				
Sample Date	4/16/2024	4/16/2024				

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	SP-1	SP-2	SP-4	SP-5R	SP-10	SP-11
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	BAP	BAP	BAP	BAP	BAP++	BAP
Depth to Water (ft)	16.70	21.73	12.90	5.51	13.87	7.64
Measured Depth Total Depth of Well (ft.)	37.99	38.19	38.30	78.00	54.10	34.51
Height of Water Column (ft.)	21.29	16.46	25.40	72.49	40.23	26.87
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	3.47	2.68	4.14	11.82	6.56	4.38
Water Removed From Well (gallons)	12.00	12.00	10.25	27.75	20.50	9.25
Method of Removal	Pump	Pump	Pump	Pump	Pump	Pump
Was Well Purged Dry?	No	No	Yes	Yes	Yes	Yes
pH (standard units)	7.76	7.61	7.58	7.54	7.69	7.59
Temperature (°C)	19.72	20.14	20.47	20.24	19.89	19.82
Conductivity (µmhos/cc)	879	3,510	2,180	3,120	6,100	1,590
Turbidity (NTU)	13.2	28.2	20.2	47.1	10.2	38.9
Appearance	Clear	Clear	Clear	Clear	Slight Black Tint	Clear
Odor	None	None	None	None	Sulphur	None
Containers	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C
Sample Time	1535	1522	1841	1906	1500	1511
Sample Date	4/16/2024	4/16/2024	4/16/2024	4/16/2024	4/16/2024	4/16/2024

BAP DUP 1400

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald/Matt Hamilton . **DATE:** 04/16/24 .

Well Identification Number	SP-3	SP-6	SP-7	SP-8	SP-9	
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	
Samples	NA	NA	NA	NA	NA	
Depth to Water (ft)	14.97	20.14	23.93	5.99	43.00	
Measured Depth Total Depth of Well (ft.)	37.90	73.93	84.02	74.06	78.82	
Height of Water Column (ft.)	37.90	53.79	60.09	68.07	35.82	
Well Size (I.D.) (inches)	2	2	2	2	2	
Volume of Water in Well (gallons)	6.18	8.77	9.79	11.10	5.84	
Water Removed From Well (gallons)	----	----	----	----	----	
Method of Removal	----	----	----	----	----	
Was Well Purged Dry?	----	----	----	----	----	
pH (standard units)	----	----	----	----	----	
Temperature (°C)	----	----	----	----	----	
Conductivity (µmhos/cc)	----	----	----	----	----	
Turbidity (NTU)	----	----	----	----	----	
Appearance	----	----	----	----	----	
Odor	----	----	----	----	----	
Containers	------	------	-------	------	------	
Sample Time	----	----	----	----	----	
Sample Date	----	----	----	----	----	

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald **DATE:** 08/26/24 .

Well Identification Number	MW-3D	MW-4D	MW-5D	MW-6D	MW-9D	MW-12D	MW-15
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	B, SO_4, pH	B, SO_4, Ca, pH	B, SO_4, pH	B, SO_4, Ca, pH	B, SO_4, Ca, pH	B, SO_4, pH	B, SO_4, pH
Depth to Water (ft)	37.93	44.28	25.63	34.22	44.90	17.11	60.46
Measured Depth Total Depth of Well (ft.)	62.95	53.86	58.42	58.51	63.10	44.92	74.21
Height of Water Column (ft.)	25.02	9.58	32.79	24.29	18.20	27.81	13.75
Well Size (I.D.) (inches)	2	2	2	2	2	2	2
Volume of Water in Well (gallons)	4.08	1.56	5.34	3.96	2.97	4.53	2.24
Water Removed From Well (gallons)	13.00	8.00	13.75	7.75	4.00	12.50	4.00
Method of Removal	Pump	Pump	Pump	Pump	Pump	Pump	Pump
Was Well Purged Dry?	No	No	Yes	Yes	Yes	Yes	Yes
pH (standard units)	7.32	7.08	7.47	7.52	7.82	8.35	7.67
Temperature (°C)	22.47	21.66	22.14	23.01	22.49	20.78	22.41
Conductivity (µmhos/cc)	896	1090	857	1,350	1390	1180	1360
Turbidity (NTU)	18.4	62.4	11.2	47.2	59.7	21.2	71.2
Appearance	Clear	Slightly Turbid	Clear	Slightly Turbid	Slightly Turbid	Clear	Turbid
Odor	None	None	None	None	None	None	None
Containers	250 mL HNO3 250 mL Cool 0-6C	2 x 250 mL HNO3 250 mL Cool 0-6C	250 mL HNO3 250 mL Cool 0-6C	2 x 250 mL HNO3 250 mL Cool 0-6C	250 mL HNO3 250 mL Cool 0-6C	250 mL HNO3 250 mL Cool 0-6C	250 mL HNO3 250 mL Cool 0-6C
Sample Time	1409	1336	1622	1434	1520	1513	1605
Sample Date	8/26/2024	8/26/2024	8/26/2024	8/26/2024	8/26/2024	8/26/2024	8/26/2024

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	NA	Landfill	Slurry Wall	Landfill	Slurry Wall
Depth to Water (ft)	54.34	26.78	60.81	35.65	37.80	25.62
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.91	10.98	0.99	1.10	25.15	1.59
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.64	1.79	0.16	0.18	4.10	0.26
Water Removed From Well (gallons)	0.50	----	0.00	0.00	12.50	0.25
Method of Removal	Pump	----	Pump	Pump	Pump	Pump
Was Well Purged Dry?	Yes	----	Yes	Yes	Yes	Yes
pH (standard units)	----	----	----	----	7.31	----
Temperature (°C)	----	----	----	----	19.79	----
Conductivity (µmhos/cc)	----	----	----	----	960	----
Turbidity (NTU)	----	----	----	----	65.4	----
Appearance	----	----	----	----	Slightly Turbid	----
Odor	----	----	----	----	None	----
Containers	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	----	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	----	----	----	----	947	----
Sample Date	----	----	----	----	10/22/2024	----

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	NA	Landfill	NA	Landfill	Slurry Wall
Depth to Water (ft)	44.20	Dry	30.06	24.75	34.23	Dry
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	9.66	----	28.36	8.40	24.28	----
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.57	----	4.62	1.37	3.96	----
Water Removed From Well (gallons)	6.25	----	11.75	----	8.00	----
Method of Removal	Pump	----	Pump	----	Pump	----
Was Well Purged Dry?	Yes	----	Yes	----	Yes	----
pH (standard units)	7.08	----	7.11	----	7.37	----
Temperature (°C)	20.09	----	21.21	----	20.58	----
Conductivity (µmhos/cc)	1,180	----	914	----	1,390	----
Turbidity (NTU)	137	----	34.6	----	104	----
Appearance	Turbid	----	Clear	----	Slightly Turbid	----
Odor	None	----	None	----	None	----
Containers	250 mL HNO3 1 L Cool 0-6C	----	250 mL HNO3 1 L Cool 0-6C	----	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	834	----	1213	----	1025	----
Sample Date	10/22/2024	----	10/22/2024	----	10/22/2024	----

Landfill Dup 1230

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	NA	NA	NA	NA	Landfill	Slurry Wall
Depth to Water (ft)	13.25	13.39	27.92	11.18	44.93	28.37
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	45.45	20.15	36.58	32.12	18.17	8.34
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	7.41	3.28	5.96	5.24	2.96	1.36
Water Removed From Well (gallons)	----	----	----	----	4.25	2.50
Method of Removal	----	----	----	----	Pump	Pump
Was Well Purged Dry?	----	----	----	----	Yes	Yes
pH (standard units)	----	----	----	----	8.27	12.01
Temperature (°C)	----	----	----	----	20.94	21.93
Conductivity (µmhos/cc)	----	----	----	----	1,570	3,190
Turbidity (NTU)	----	----	----	----	204	52.4
Appearance	----	----	----	----	Turbid	Brown
Odor	----	----	----	----	None	None
Containers	----	----	----	----	250 mL HNO3 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	----	----	----	----	1104	1052
Sample Date	----	----	----	----	10/22/2024	10/22/2024

Slurry Wall Dup
1200

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	NA	Landfill	NA	Landfill	Slurry Wall
Depth to Water (ft)	67.86	26.51	48.33	17.60	19.39	19.77
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	3.47	9.71	2.01	13.42	25.53	3.17
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.57	1.58	0.33	2.19	4.16	0.52
Water Removed From Well (gallons)	0.25	----	0.25	----	10.75	1.50
Method of Removal	Pump	----	Pump	----	Pump	Pump
Was Well Purged Dry?	Yes	----	Yes	----	Yes	Yes
pH (standard units)	----	----	----	----	8.18	6.81
Temperature (°C)	----	----	----	----	20.67	24.12
Conductivity (µmhos/cc)	----	----	----	----	1,200	1,600
Turbidity (NTU)	----	----	----	----	97.3	32.6
Appearance	----	----	----	----	Slightly Turbid	Slightly Turbid
Odor	----	----	----	----	None	None
Containers	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	----	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	----	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C
Sample Time	----	----	----	----	1506	1452
Sample Date	----	----	----	----	10/22/2024	10/22/2024

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Landfill	Slurry Wall	Landfill	Landfill	Landfill	Landfill
Depth to Water (ft)	38.40	Dry	59.71	61.75	63.23	50.16
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	9.16	----	19.25	12.46	0.92	8.25
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.49	----	3.14	2.03	0.15	1.34
Water Removed From Well (gallons)	4.00	----	5.25	4.75	----	1.00
Method of Removal	Pump	----	Pump	Pump	----	Pump
Was Well Purged Dry?	Yes	----	Yes	Yes	----	Yes
pH (standard units)	7.26	----	7.67	8.21	----	----
Temperature (°C)	22.84	----	21.69	20.78	----	----
Conductivity (µmhos/cc)	1,460	----	4,510	1,340	----	----
Turbidity (NTU)	42.7	----	20.6	127	----	----
Appearance	Clear	----	Clear	Slightly Turbid	----	----
Odor	None	----	None	None	----	----
Containers	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 250 mL HCL 1 L Cool 0-6C	250 mL HNO3 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C
Sample Time	1425	----	1247	1136	----	----
Sample Date	10/22/2024	----	10/22/2024	10/22/2024	----	----

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	MW-18	MW-19				
Activities	Gauge	Gauge				
Samples	Landfill	Landfill				
Depth to Water (ft)	22.30	21.16				
Measured Depth Total Depth of Well (ft.)	93.78	93.80				
Height of Water Column (ft.)	71.48	72.64				
Well Size (I.D.) (inches)	2	2				
Volume of Water in Well (gallons)	11.65	11.84				
Water Removed From Well (gallons)	12.25	19.25				
Method of Removal	Pump	Pump				
Was Well Purged Dry?	Yes	Yes				
pH (standard units)	7.36	8.15				
Temperature (°C)	20.06	20.13				
Conductivity (µmhos/cc)	32,300	41,000				
Turbidity (NTU)	16.5	24.8				
Appearance	Clear	Clear				
Odor	Sulphur	None				
Containers	250 mL HNO3 1 L Cool 0-6C	250 mL HNO3 1 L Cool 0-6C				
Sample Time	1704	1736				
Sample Date	10/22/2024	10/22/2024				

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	SP-1	SP-2	SP-4	SP-5R	SP-10	SP-11
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	BAP	BAP	BAP	BAP	BAP++	BAP
Depth to Water (ft)	18.24	22.28	11.01	9.83	0.00	11.56
Measured Depth Total Depth of Well (ft.)	37.99	38.19	38.30	78.00	54.10	34.51
Height of Water Column (ft.)	19.75	15.91	27.29	68.17	54.10	22.95
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	3.22	2.59	4.45	11.11	8.82	3.74
Water Removed From Well (gallons)	11.00	9.00	10.00	25.75	21.75	6.75
Method of Removal	Pump	Pump	Pump	Pump	Pump	Pump
Was Well Purged Dry?	No	No	Yes	Yes	Yes	Yes
pH (standard units)	7.49	7.32	7.94	7.83	7.91	7.39
Temperature (°C)	22.87	22.71	21.83	19.32	22.35	22.42
Conductivity (µmhos/cc)	853	1,890	2,000	2,700	6,210	1,360
Turbidity (NTU)	11.4	10.7	14.9	18.6	10.7	14.8
Appearance	Clear	Clear	Clear	Clear	Clear	Clear
Odor	None	None	None	None	Slight Sulphur	None
Containers	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C	250 mL HNO3 125 mL HCL 3 x 1L HNO3 1 L Cool 0-6C
Sample Time	1608	1537	1641	1809	1316	1349
Sample Date	10/22/2024	10/22/2024	10/22/2024	10/22/2024	10/22/2024	10/22/2024

BAP Dup 1300

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NORTHEASTERN POWER PLANT
GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . **DATE:** 10/22/24 .

Well Identification Number	SP-3	SP-6	SP-7	SP-8	SP-9	
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	
Samples	NA	NA	NA	NA	NA	
Depth to Water (ft)	0.00	20.21	23.73	7.88	39.61	
Measured Depth Total Depth of Well (ft.)	37.90	73.93	84.02	74.06	78.82	
Height of Water Column (ft.)	37.90	53.72	60.29	66.18	39.21	
Well Size (I.D.) (inches)	2	2	2	2	2	
Volume of Water in Well (gallons)	6.18	8.76	9.83	10.79	6.39	
Water Removed From Well (gallons)	----	----	----	----	----	
Method of Removal	----	----	----	----	----	
Was Well Purged Dry?	----	----	----	----	----	
pH (standard units)	----	----	----	----	----	
Temperature (°C)	----	----	----	----	----	
Conductivity (µmhos/cc)	----	----	----	----	----	
Turbidity (NTU)	----	----	----	----	----	
Appearance	----	----	----	----	----	
Odor	----	----	----	----	----	
Containers	----	----	----	----	----	
Sample Time	----	----	----	----	----	
Sample Date	----	----	----	----	----	

For 2" well multiply by	0.163
For 4" well multiply by	0.653

Water Analysis Report

Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241339 **Customer: Northeastern 3&4 Power Station** **Date Reported: 06/18/2024**

Customer Sample ID: MW-2D
Lab Number: 241339-001
Date Collected: 04/16/2024 18:18 EDT

Customer Description:
Preparation:
Date Received: 04/23/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.51	µg/L	10	1.00	0.08	J1	GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Arsenic	21.2	µg/L	10	1.0	0.3		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Barium	33.1	µg/L	10	2.0	0.5		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Beryllium	0.28	µg/L	10	0.50	0.07	J1	GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Boron	9.01	mg/L	10	0.50	0.07		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Cadmium	0.36	µg/L	10	0.20	0.04		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Calcium	13.3	mg/L	10	0.5	0.2		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Chromium	4.3	µg/L	10	3.0	0.7		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Cobalt	0.47	µg/L	10	0.20	0.05		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Lead	4.4	µg/L	10	2.0	0.5		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Lithium	0.0010	mg/L	10	0.0030	0.0006	J1	GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Magnesium	0.30	mg/L	10	1.00	0.09	J1	GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Molybdenum	455	µg/L	10	5	1		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Potassium	4.1	mg/L	10	1.0	0.1		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Selenium	12.4	µg/L	10	5.0	0.4		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Sodium	385	mg/L	10	2.0	0.2		GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4
Thallium	0.2	µg/L	10	2.0	0.2	J1	GES	05/08/2024 19:15	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 241339 **Customer: Northeastern 3&4 Power Station** **Date Reported: 06/18/2024**

Customer Sample ID: MW-13D
Lab Number: 241339-002
Date Collected: 04/16/2024 15:13 EDT

Customer Description:
Preparation:
Date Received: 04/23/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.202	µg/L	1	0.100	0.008		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Arsenic	1.73	µg/L	1	0.10	0.03		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Barium	73.0	µg/L	1	0.20	0.05		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Beryllium	0.143	µg/L	1	0.050	0.007		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Boron	2.32	mg/L	1	0.050	0.007		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Cadmium	0.161	µg/L	1	0.020	0.004		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Calcium	212	mg/L	5	0.3	0.1		GES	05/08/2024 19:26	EPA 200.8-1994, Rev. 5.4
Chromium	2.23	µg/L	1	0.30	0.07		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Cobalt	3.11	µg/L	1	0.020	0.005		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Lead	2.26	µg/L	1	0.20	0.05		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Lithium	0.0173	mg/L	1	0.00030	0.00006		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Magnesium	84.2	mg/L	1	0.100	0.009		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	04/25/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	16.0	µg/L	1	0.5	0.1		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Potassium	2.61	mg/L	1	0.10	0.01		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Selenium	3.59	µg/L	1	0.50	0.04		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Sodium	82.8	mg/L	1	0.20	0.02		GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4
Thallium	0.05	µg/L	1	0.20	0.02	J1	GES	05/08/2024 19:21	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Reissued

Job ID: 241339 **Customer: Northeastern 3&4 Power Station** **Date Reported: 06/18/2024**

Customer Sample ID: MW-14
Lab Number: 241339-003
Date Collected: 04/16/2024 18:43 EDT

Customer Description:
Preparation:
Date Received: 04/23/2024 10:00 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Antimony	0.5	µg/L	20	2.0	0.2	J1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Arsenic	<0.6	µg/L	20	2.0	0.6	U1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Barium	152	µg/L	20	4	1		GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Beryllium	<0.1	µg/L	20	1.0	0.1	U1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Boron	0.7	mg/L	20	1.0	0.1	J1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Cadmium	0.13	µg/L	20	0.40	0.08	J1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Calcium	71.0	mg/L	20	1.0	0.4		GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Chromium	<1	µg/L	20	6	1	U1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Cobalt	0.2	µg/L	20	0.4	0.1	J1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Lead	<1	µg/L	20	4	1	U1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Lithium	0.138	mg/L	20	0.006	0.001		GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Magnesium	20.8	mg/L	20	2.0	0.2		GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Mercury	4	ng/L	1	5	2	J1	RLP	04/25/2024 00:00	EPA 245.7-2005, Rev. 2.0
Molybdenum	9	µg/L	20	10	2	J1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Potassium	5.6	mg/L	20	2.0	0.2		GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Selenium	3.8	µg/L	20	10.0	0.8	J1	GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Sodium	945	mg/L	20	4.0	0.4		GES	05/08/2024 19:31	EPA 200.8-1994, Rev. 5.4
Thallium	<0.2	µg/L	9	1.8	0.2	U1	GES	06/11/2024 11:08	EPA 200.8-1994, Rev. 5.4

241339
Job Comments:

Original report issued 5/14/24. Report reissued 6/18/24 with Tl analyzed at a lower dilution for 241339-003.

Water Analysis Report

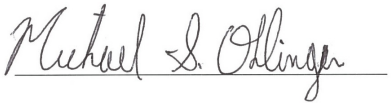
Reissued

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241339 **Customer: Northeastern 3&4 Power Station** **Date Reported: 06/18/2024**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or below method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE PS LF BKG CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 241339

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3: As, B, Ba, Be, Ca,Cd, Cr, Co,K, Li, Na, Pb, Mg, Mo, Sb, Se, TL	1 L bottle, Cool, 0-6°C: TDS, F, Cl, SO4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3: Ra-226, Ra-228	250 mL Glass, HCL**, pH<2: Hg	Field-filter 500 mL bottle, then pH<2, HNO_3: dissolved Fe and Mn		Sample Specific Notes:
MW-2D	4/16/2024	1718	G	GW	1		X						
MW-13D	4/16/2024	1413	G	GW	2		X			X			
MW-14	4/16/2024	1743	G	GW	2		X			X			
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	EAGLE	04/19/24 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 4/23/24 1000

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Northeastern **Number of Plastic Containers:** 3

Opened By MGK/MSD **Number of Glass Containers:** –

Date/Time 4/23/24 1300 **Number of Mercury Containers:** 2

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial:** _____ on ice / (no ice)

(IR Gun Ser# 240009843, *Expir.* 01/03/2026) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: routine If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** MGK 4/23/24

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 241339 Initial & Date & Time : _____

Comments: _____

Logged by MSJ _____

Reviewed by [signature] 4/24/24 _____

_____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241288 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Customer Sample ID: MW-2D
Customer Description:
Lab Number: 241288-001
Preparation:
Date Collected: 04/16/2024 18:18 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.46	mg/L	2	0.10	0.02		CRJ	05/01/2024 10:21	EPA 300.1 -1997, Rev. 1.0
Chloride	15.6	mg/L	2	0.06	0.02		CRJ	05/01/2024 10:21	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.38	mg/L	2	0.06	0.02		CRJ	05/01/2024 10:21	EPA 300.1 -1997, Rev. 1.0
Sulfate	602	mg/L	25	8	2		CRJ	04/30/2024 21:44	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	188	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	1100	mg/L	2	100	40		ELT	04/22/2024 09:30	SM 2540C-2015

Customer Sample ID: MW-9D
Customer Description:
Lab Number: 241288-002
Preparation:
Date Collected: 04/16/2024 17:37 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.29	mg/L	2	0.10	0.02		CRJ	05/01/2024 10:54	EPA 300.1 -1997, Rev. 1.0
Chloride	25.0	mg/L	2	0.06	0.02		CRJ	05/01/2024 10:54	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.88	mg/L	2	0.06	0.02		CRJ	05/01/2024 10:54	EPA 300.1 -1997, Rev. 1.0
Sulfate	625	mg/L	25	8	2		CRJ	04/30/2024 22:17	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	694	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	1330	mg/L	2	100	40		ELT	04/22/2024 09:35	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241288 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Customer Sample ID: MW-13D
Customer Description:
Lab Number: 241288-003
Preparation:
Date Collected: 04/16/2024 15:13 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.17	mg/L	2	0.10	0.02		CRJ	05/01/2024 12:00	EPA 300.1 -1997, Rev. 1.0
Chloride	10.2	mg/L	2	0.06	0.02		CRJ	05/01/2024 12:00	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.47	mg/L	2	0.06	0.02		CRJ	05/01/2024 12:00	EPA 300.1 -1997, Rev. 1.0
Sulfate	669	mg/L	25	8	2		CRJ	04/30/2024 23:23	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	454	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	1320	mg/L	2	100	40		ELT	04/22/2024 09:35	SM 2540C-2015

Customer Sample ID: MW-14
Customer Description:
Lab Number: 241288-004
Preparation:
Date Collected: 04/16/2024 18:43 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	3.4	mg/L	50	2.5	0.5		CRJ	05/01/2024 12:33	EPA 300.1 -1997, Rev. 1.0
Chloride	920	mg/L	50	1.5	0.5		CRJ	05/01/2024 12:33	EPA 300.1 -1997, Rev. 1.0
Fluoride	2.7	mg/L	50	1.5	0.5		CRJ	05/01/2024 12:33	EPA 300.1 -1997, Rev. 1.0
Sulfate	136	mg/L	50	15	3		CRJ	05/01/2024 12:33	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	603	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	1900	mg/L	20	1000	400		ELT	04/22/2024 09:41	SM 2540C-2015

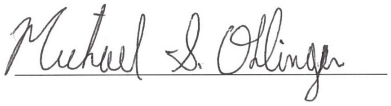
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241288 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE PS LF BKG CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 241288

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	As, B, Ba, Be, Ca, Cd, Cr, Co, K, Li, Na, Pb, Mg, Mo, Sb, Se, Tl (250 mL bottle, pH<2, HNO_3)	TDS, F, Cl, SO_4, Br, Alkalinity (1 L bottle, Cool, 0-6°C)	Ra-226, Ra-228 (Three (six every 10th*) 1 L bottles, pH<2, HNO_3)	Hg (250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2)	dissolved Fe and Mn (Field-filter 500 mL bottle, then pH<2, HNO_3)		Sample Specific Notes:
MW-2D	4/16/2024	1718	G	GW	1			X					
MW-9D	4/16/2024	1637	G	GW	1			X					
MW-13D	4/16/2024	1413	G	GW	1			X					
MW-14	4/16/2024	1743	G	GW	1			X					
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	EAGLE	04/17/24 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
			[signature] Ohly	4/18/24 1000

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Northeastern 3rd 4 P.S **Number of Plastic Containers:** 4

Opened By William **Number of Glass Containers:** _____

Date/Time 04/18/24 10:00 AM **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** WCG (on ice) / no ice

(IR Gun Ser# 240009843, *Expir.* 01/03/2026) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: 28 days If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** WCG 04/18/24

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X0CRWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 241288 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

Reviewed by WCG _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241342 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/15/2024**

Customer Sample ID: MW-3D
Customer Description:
Lab Number: 241342-001
Preparation:
Date Collected: 04/16/2024 16:57 EDT
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.872	mg/L	1	0.050	0.007		GES	05/09/2024 12:55	EPA 200.8-1994, Rev. 5.4
Calcium	116	mg/L	1	0.05	0.02		GES	05/09/2024 12:55	EPA 200.8-1994, Rev. 5.4
Magnesium	38.1	mg/L	1	0.100	0.009		GES	05/09/2024 12:55	EPA 200.8-1994, Rev. 5.4
Potassium	1.87	mg/L	1	0.10	0.01		GES	05/09/2024 12:55	EPA 200.8-1994, Rev. 5.4
Sodium	58.5	mg/L	1	0.20	0.02		GES	05/09/2024 12:55	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-4D
Customer Description:
Lab Number: 241342-002
Preparation:
Date Collected: 04/16/2024 19:02 EDT
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	1.01	mg/L	1	0.050	0.007		GES	05/09/2024 13:00	EPA 200.8-1994, Rev. 5.4
Calcium	179	mg/L	1	0.05	0.02		GES	05/09/2024 13:00	EPA 200.8-1994, Rev. 5.4
Magnesium	21.2	mg/L	1	0.100	0.009		GES	05/09/2024 13:00	EPA 200.8-1994, Rev. 5.4
Potassium	1.66	mg/L	1	0.10	0.01		GES	05/09/2024 13:00	EPA 200.8-1994, Rev. 5.4
Sodium	89.1	mg/L	1	0.20	0.02		GES	05/09/2024 13:00	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-5D
Customer Description:
Lab Number: 241342-003
Preparation:
Date Collected: 04/16/2024 18:29 EDT
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.400	mg/L	1	0.050	0.007		GES	05/09/2024 13:05	EPA 200.8-1994, Rev. 5.4
Calcium	115	mg/L	1	0.05	0.02		GES	05/09/2024 13:05	EPA 200.8-1994, Rev. 5.4
Magnesium	36.5	mg/L	1	0.100	0.009		GES	05/09/2024 13:05	EPA 200.8-1994, Rev. 5.4
Potassium	1.05	mg/L	1	0.10	0.01		GES	05/09/2024 13:05	EPA 200.8-1994, Rev. 5.4
Sodium	33.8	mg/L	1	0.20	0.02		GES	05/09/2024 13:05	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241342 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/15/2024**

Customer Sample ID: MW-6D
Lab Number: 241342-004
Date Collected: 04/16/2024 17:21 EDT
Customer Description:
Preparation:
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	2.57	mg/L	1	0.050	0.007		GES	05/09/2024 13:10	EPA 200.8-1994, Rev. 5.4
Calcium	201	mg/L	5	0.3	0.1		GES	05/09/2024 13:19	EPA 200.8-1994, Rev. 5.4
Magnesium	31.8	mg/L	1	0.100	0.009		GES	05/09/2024 13:10	EPA 200.8-1994, Rev. 5.4
Potassium	3.03	mg/L	1	0.10	0.01		GES	05/09/2024 13:10	EPA 200.8-1994, Rev. 5.4
Sodium	126	mg/L	1	0.20	0.02		GES	05/09/2024 13:10	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-9D
Lab Number: 241342-005
Date Collected: 04/16/2024 17:37 EDT
Customer Description:
Preparation:
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	5.67	mg/L	5	0.25	0.04		GES	05/09/2024 13:24	EPA 200.8-1994, Rev. 5.4
Calcium	299	mg/L	5	0.3	0.1		GES	05/09/2024 13:24	EPA 200.8-1994, Rev. 5.4
Magnesium	83.7	mg/L	5	0.50	0.05		GES	05/09/2024 13:24	EPA 200.8-1994, Rev. 5.4
Potassium	5.41	mg/L	5	0.50	0.05		GES	05/09/2024 13:24	EPA 200.8-1994, Rev. 5.4
Sodium	134	mg/L	5	1.0	0.1		GES	05/09/2024 13:24	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-12D
Lab Number: 241342-006
Date Collected: 04/16/2024 15:38 EDT
Customer Description:
Preparation:
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	6.64	mg/L	2	0.10	0.01		GES	05/09/2024 13:29	EPA 200.8-1994, Rev. 5.4
Calcium	67.7	mg/L	2	0.10	0.04		GES	05/09/2024 13:29	EPA 200.8-1994, Rev. 5.4
Magnesium	7.61	mg/L	2	0.20	0.02		GES	05/09/2024 13:29	EPA 200.8-1994, Rev. 5.4
Potassium	1.84	mg/L	2	0.20	0.02		GES	05/09/2024 13:29	EPA 200.8-1994, Rev. 5.4
Sodium	214	mg/L	2	0.40	0.04		GES	05/09/2024 13:29	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241342 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/15/2024**

Customer Sample ID: MW-15 Customer Description:
Lab Number: 241342-007 Preparation:
Date Collected: 04/16/2024 18:01 EDT Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	6.73	mg/L	1	0.050	0.007		GES	05/09/2024 13:34	EPA 200.8-1994, Rev. 5.4
Calcium	113	mg/L	1	0.05	0.02	M1	GES	05/09/2024 13:34	EPA 200.8-1994, Rev. 5.4
Magnesium	34.0	mg/L	1	0.100	0.009	M1	GES	05/09/2024 13:34	EPA 200.8-1994, Rev. 5.4
Potassium	2.07	mg/L	1	0.10	0.01		GES	05/09/2024 13:34	EPA 200.8-1994, Rev. 5.4
Sodium	153	mg/L	1	0.20	0.02	M1	GES	05/09/2024 13:34	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-18 Customer Description:
Lab Number: 241342-008 Preparation:
Date Collected: 04/16/2024 19:27 EDT Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	1.28	mg/L	10	0.50	0.07		GES	05/09/2024 21:54	EPA 200.8-1994, Rev. 5.4
Calcium	648	mg/L	10	0.5	0.2	M1	GES	05/09/2024 21:54	EPA 200.8-1994, Rev. 5.4
Magnesium	240	mg/L	10	1.00	0.09	M1	GES	05/09/2024 21:54	EPA 200.8-1994, Rev. 5.4
Potassium	32.3	mg/L	10	1.0	0.1	M1	GES	05/09/2024 21:54	EPA 200.8-1994, Rev. 5.4
Sodium	7190	mg/L	50	10	1	M1, B3	GES	05/09/2024 21:59	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-19 Customer Description:
Lab Number: 241342-009 Preparation:
Date Collected: 04/16/2024 19:16 EDT Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	1.5	mg/L	50	2.5	0.4	J1	GES	05/09/2024 22:30	EPA 200.8-1994, Rev. 5.4
Calcium	751	mg/L	50	3	1		GES	05/09/2024 22:30	EPA 200.8-1994, Rev. 5.4
Magnesium	425	mg/L	50	5.0	0.5		GES	05/09/2024 22:30	EPA 200.8-1994, Rev. 5.4
Potassium	28.1	mg/L	50	5.0	0.5		GES	05/09/2024 22:30	EPA 200.8-1994, Rev. 5.4
Sodium	8240	mg/L	50	10	1		GES	05/09/2024 22:30	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241342 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/15/2024**

Customer Sample ID: LANDFILL DUPLICATE
Customer Description:
Lab Number: 241342-010
Preparation:
Date Collected: 04/16/2024 15:30 EDT
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.90	mg/L	5	0.25	0.04		GES	05/09/2024 22:35	EPA 200.8-1994, Rev. 5.4
Calcium	125	mg/L	5	0.3	0.1		GES	05/09/2024 22:35	EPA 200.8-1994, Rev. 5.4
Magnesium	42.7	mg/L	5	0.50	0.05		GES	05/09/2024 22:35	EPA 200.8-1994, Rev. 5.4
Potassium	2.07	mg/L	5	0.50	0.05		GES	05/09/2024 22:35	EPA 200.8-1994, Rev. 5.4
Sodium	63.3	mg/L	5	1.0	0.1		GES	05/09/2024 22:35	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: LANDFILL EQUIPMENT BLANK
Customer Description:
Lab Number: 241342-011
Preparation:
Date Collected: 04/16/2024 17:24 EDT
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	05/09/2024 22:40	EPA 200.8-1994, Rev. 5.4
Calcium	0.02	mg/L	1	0.05	0.02	J1	GES	05/09/2024 22:40	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	GES	05/09/2024 22:40	EPA 200.8-1994, Rev. 5.4
Potassium	0.01	mg/L	1	0.10	0.01	J1	GES	05/09/2024 22:40	EPA 200.8-1994, Rev. 5.4
Sodium	0.27	mg/L	1	0.20	0.02		GES	05/09/2024 22:40	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: LANDFILL FIELD BLANK
Customer Description:
Lab Number: 241342-012
Preparation:
Date Collected: 04/16/2024 18:15 EDT
Date Received: 04/16/2024 15:57 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.007	mg/L	1	0.050	0.007	U1	GES	05/09/2024 22:45	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	GES	05/09/2024 22:45	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	GES	05/09/2024 22:45	EPA 200.8-1994, Rev. 5.4
Potassium	0.01	mg/L	1	0.10	0.01	J1	GES	05/09/2024 22:45	EPA 200.8-1994, Rev. 5.4
Sodium	0.26	mg/L	1	0.20	0.02		GES	05/09/2024 22:45	EPA 200.8-1994, Rev. 5.4

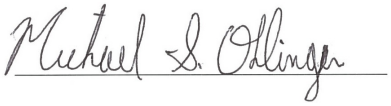
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241342 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/15/2024**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

M1 - The associated matrix spike (MS) or matrix spike duplicate (MSD) recovery was outside acceptance limits.
B3 - Analyte detected in continuing calibration blank (CCB) at or above the method criteria.
J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.
U1 - Not detected at or below method detection limit (MDL).

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE LF Semi-Annual CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days): Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only: COC/Order #: 241342

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 HG	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	Sample Specific Notes:
MW-3D	4/16/2024	1557	G	GW	1		X					
MW-4D	4/16/2024	1802	G	GW	1		X					
MW-5D	4/16/2024	1729	G	GW	1		X					
MW-6D	4/16/2024	1621	G	GW	1		X					
MW-9D	4/16/2024	1637	G	GW	1		X					
MW-12D	4/16/2024	1438	G	GW	1		X					
MW-15	4/16/2024	1701	G	GW	1		X					
MW-18	4/16/2024	1827	G	GW	1		X					
MW-19	4/16/2024	1816	G	GW	1		X					
LANDFILL DUPLICATE	4/16/2024	1430	G	GW	1		X					
LANDFILL EQUIPMENT BLANK	4/16/2024	1624	G	W	1		X					
LANDFILL FIELD BLANK	4/16/2024	1715	G	W	1		X					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4			

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
KA MA	EA Eng	04/18/24 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
			Michael Ohlinger	4/23/24 1000

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer Northeastern **Number of Plastic Containers:** 12

Opened By MSD **Number of Glass Containers:** -

Date/Time 4/23/24 1000 **Number of Mercury Containers:** -

Were all temperatures within 0-6°C? Y / N or (N/A) **Initial**: _____ on ice / no ice

(IR Gun Ser# 240009843, *Expir.* 01/03/2026) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** MSK 4/23/24

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 241342

Comments: _____

Logged by MSD _____

Reviewed by _____ 4/24/24

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241286 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Customer Sample ID: MW-3D
Customer Description:
Lab Number: 241286-001
Preparation:
Date Collected: 04/16/2024 16:57 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.29	mg/L	2	0.10	0.02		CRJ	05/01/2024 02:07	EPA 300.1 -1997, Rev. 1.0
Chloride	12.7	mg/L	2	0.06	0.02		CRJ	05/01/2024 02:07	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.79	mg/L	2	0.06	0.02		CRJ	05/01/2024 02:07	EPA 300.1 -1997, Rev. 1.0
Sulfate	168	mg/L	10	3.0	0.6		CRJ	04/30/2024 11:52	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	384	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	610	mg/L	2	100	40		ELT	04/22/2024 08:18	SM 2540C-2015

Customer Sample ID: MW-4D
Customer Description:
Lab Number: 241286-002
Preparation:
Date Collected: 04/16/2024 19:02 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.80	mg/L	2	0.10	0.02		CRJ	05/01/2024 02:40	EPA 300.1 -1997, Rev. 1.0
Chloride	28.4	mg/L	2	0.06	0.02		CRJ	05/01/2024 02:40	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.25	mg/L	2	0.06	0.02		CRJ	05/01/2024 02:40	EPA 300.1 -1997, Rev. 1.0
Sulfate	348	mg/L	25	8	2		CRJ	04/30/2024 12:24	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	341	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	940	mg/L	2	100	40		ELT	04/22/2024 08:18	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 241286 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Customer Sample ID: MW-5D **Customer Description:**
Lab Number: 241286-003 **Preparation:**
Date Collected: 04/16/2024 18:29 EDT **Date Received: 04/18/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.16	mg/L	2	0.10	0.02		CRJ	05/01/2024 03:13	EPA 300.1 -1997, Rev. 1.0
Chloride	25.9	mg/L	2	0.06	0.02		CRJ	05/01/2024 03:13	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.58	mg/L	2	0.06	0.02		CRJ	05/01/2024 03:13	EPA 300.1 -1997, Rev. 1.0
Sulfate	129	mg/L	10	3.0	0.6		CRJ	04/30/2024 12:57	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	389	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	580	mg/L	2	100	40		ELT	04/22/2024 08:23	SM 2540C-2015

Customer Sample ID: MW-6D **Customer Description:**
Lab Number: 241286-004 **Preparation:**
Date Collected: 04/16/2024 17:21 EDT **Date Received: 04/18/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.39	mg/L	2	0.10	0.02		CRJ	05/01/2024 05:25	EPA 300.1 -1997, Rev. 1.0
Chloride	27.1	mg/L	2	0.06	0.02		CRJ	05/01/2024 05:25	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.83	mg/L	2	0.06	0.02		CRJ	05/01/2024 05:25	EPA 300.1 -1997, Rev. 1.0
Sulfate	873	mg/L	25	8	2		CRJ	04/30/2024 13:30	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	442	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	1060	mg/L	2	100	40		ELT	04/22/2024 08:23	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 241286 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Customer Sample ID: MW-12D
Customer Description:
Lab Number: 241286-005
Preparation:
Date Collected: 04/16/2024 15:38 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.37	mg/L	2	0.10	0.02		CRJ	05/01/2024 05:58	EPA 300.1 -1997, Rev. 1.0
Chloride	13.2	mg/L	2	0.06	0.02		CRJ	05/01/2024 05:58	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.63	mg/L	2	0.06	0.02		CRJ	05/01/2024 05:58	EPA 300.1 -1997, Rev. 1.0
Sulfate	502	mg/L	25	8	2		CRJ	04/30/2024 14:36	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	192	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	930	mg/L	2	100	40		ELT	04/22/2024 08:28	SM 2540C-2015

Customer Sample ID: MW-15
Customer Description:
Lab Number: 241286-006
Preparation:
Date Collected: 04/16/2024 18:01 EDT
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.33	mg/L	2	0.10	0.02		CRJ	05/01/2024 07:36	EPA 300.1 -1997, Rev. 1.0
Chloride	16.6	mg/L	2	0.06	0.02		CRJ	05/01/2024 07:36	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.26	mg/L	2	0.06	0.02		CRJ	05/01/2024 07:36	EPA 300.1 -1997, Rev. 1.0
Sulfate	612	mg/L	25	8	2		CRJ	04/30/2024 15:09	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	153	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	1100	mg/L	2	100	40		ELT	04/22/2024 08:28	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 241286 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Customer Sample ID: MW-18 **Customer Description:**
Lab Number: 241286-007 **Preparation:**
Date Collected: 04/16/2024 19:27 EDT **Date Received: 04/18/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	36.9	mg/L	50	2.5	0.5		CRJ	04/30/2024 17:20	EPA 300.1 -1997, Rev. 1.0
Chloride	10300	mg/L	2500	80	30		CRJ	04/30/2024 20:38	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.0	mg/L	50	1.5	0.5	J1	CRJ	04/30/2024 17:20	EPA 300.1 -1997, Rev. 1.0
Sulfate	1340	mg/L	50	15	3		CRJ	04/30/2024 17:20	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	880	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	19900	mg/L	20	1000	400		ELT	04/22/2024 08:34	SM 2540C-2015

Customer Sample ID: MW-19 **Customer Description:**
Lab Number: 241286-008 **Preparation:**
Date Collected: 04/16/2024 19:16 EDT **Date Received: 04/18/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	54.8	mg/L	50	2.5	0.5		CRJ	04/30/2024 17:53	EPA 300.1 -1997, Rev. 1.0
Chloride	14400	mg/L	2500	80	30		CRJ	04/30/2024 21:11	EPA 300.1 -1997, Rev. 1.0
Fluoride	3.0	mg/L	50	1.5	0.5		CRJ	04/30/2024 17:53	EPA 300.1 -1997, Rev. 1.0
Sulfate	10	mg/L	50	15	3	J1	CRJ	04/30/2024 17:53	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	523	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	23500	mg/L	20	1000	400		ELT	04/22/2024 08:34	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 241286 **Customer: Northeastern 3&4 Power Station** **Date Reported: 05/07/2024**

Customer Sample ID: Landfill Duplicate
Lab Number: 241286-009
Date Collected: 04/16/2024 15:30 EDT

Customer Description:
Preparation:
Date Received: 04/18/2024 10:00 EDT

Ion Chromatography

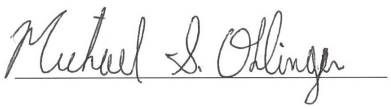
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.29	mg/L	2	0.10	0.02		CRJ	05/01/2024 07:04	EPA 300.1 -1997, Rev. 1.0
Chloride	13.3	mg/L	2	0.06	0.02		CRJ	05/01/2024 07:04	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.80	mg/L	2	0.06	0.02		CRJ	05/01/2024 07:04	EPA 300.1 -1997, Rev. 1.0
Sulfate	160	mg/L	50	15	3		CRJ	04/30/2024 11:11	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	393	mg/L	1	20	5		MGK	04/18/2024 18:19	SM 2320B-2011
TDS, Filterable Residue	630	mg/L	2	100	40		ELT	04/22/2024 08:45	SM 2540C-2015

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

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

Chain of Custody Record

4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Program: Coal Combustion Residuals (CCR)

Project Name: NE LF Semi-Annual CCR sampling
Contact Name: Rebecca Jones
Contact Phone: 737-330-3725
Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 241286

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 HG	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn	Sample Specific Notes:
MW-3D	4/16/2024	1557	G	GW	1			X				
MW-4D	4/16/2024	1802	G	GW	1			X				
MW-5D	4/16/2024	1729	G	GW	1			X				
MW-6D	4/16/2024	1621	G	GW	1			X				
MW-12D	4/16/2024	1438	G	GW	1			X				
MW-15	4/16/2024	1701	G	GW	1			X				
MW-18	4/16/2024	1827	G	GW	1			X				
MW-19	4/16/2024	1816	G	GW	1			X				
LANDFILL DUPLICATE	4/16/2024	1430	G	GW	1			X				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4			

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: KAM	Company: EAGLE	Date/Time: 04/17/24 1406	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 4/18/24 10:00

AEP WATER & WASTE SAMPLE RECEIPT FORM

Package Type	Delivery Type
(Cooler) Box Bag Envelope	PONY UPS (FedEX) USPS
	Other _____

Plant/Customer NOf Meastern 324 **Number of Plastic Containers:** 9

Opened By William **Number of Glass Containers:** _____

Date/Time 04/18/24 10:00 Am **Number of Mercury Containers:** _____

Were all temperatures within 0-6°C? (Y) / N or N/A **Initial:** WCG (on ice) / no ice

(IR Gun Ser# 240009843, *Expir.* 01/03/2026) - If No, specify each deviation: _____

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: 28 days If **RUSH**, who was notified? _____

pH (15 min)	Cr^{+6} (pres) (24 hr)	NO_2 or NO_3 (48 hr)	*ortho*-PO_4 (48 hr)	Hg-diss (pres) (48 hr)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was pH checked & Color Coding done? (Y) / N or N/A **Initial & Date:** WCG 04/18/24

pH paper (circle one): MQuant,PN1.09535.0001,LOT#_____ [OR] Lab Rat,PN4801,LOT# X000RWDG21 Exp 11/15/2024

- Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was the customer contacted? If Yes: Person Contacted: _____

Lab ID# 241286 Initial & Date & Time : _____

Comments: _____

Logged by MSO _____

Reviewed by WCG _____

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the "Notes" field in the LIMS to be included on the report to the customer.

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242603 **Customer: Northeastern 3&4 Power Station** **Date Reported: 09/12/2024**

Customer Sample ID: MW-3D
Customer Description:
Lab Number: 242603-001
Preparation:
Date Collected: 08/26/2024 15:09 EDT
Date Received: 08/29/2024 10:05 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	167	mg/L	10	3.0	0.6		CRJ	09/03/2024 21:45	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.835	mg/L	1	0.050	0.007		ELT	09/09/2024 14:25	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-4D
Customer Description:
Lab Number: 242603-002
Preparation:
Date Collected: 08/26/2024 14:36 EDT
Date Received: 08/29/2024 10:05 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	270	mg/L	25	8	2		CRJ	09/03/2024 22:18	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.642	mg/L	1	0.050	0.007		ELT	09/09/2024 14:30	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-5D
Customer Description:
Lab Number: 242603-003
Preparation:
Date Collected: 08/26/2024 17:22 EDT
Date Received: 08/29/2024 10:05 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	129	mg/L	10	3.0	0.6		CRJ	09/03/2024 22:51	EPA 300.1 -1997, Rev. 1.0

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242603 **Customer: Northeastern 3&4 Power Station** **Date Reported: 09/12/2024**

Customer Sample ID: MW-6D
Customer Description:
Lab Number: 242603-004
Preparation:
Date Collected: 08/26/2024 15:34 EDT
Date Received: 08/29/2024 10:05 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	468	mg/L	25	8	2		CRJ	09/03/2024 23:57	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	2.70	mg/L	1	0.050	0.007		ELT	09/09/2024 14:35	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-9D
Customer Description:
Lab Number: 242603-005
Preparation:
Date Collected: 08/26/2024 16:20 EDT
Date Received: 08/29/2024 10:05 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	529	mg/L	25	8	2		CRJ	09/04/2024 00:30	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	5.65	mg/L	1	0.050	0.007		ELT	09/09/2024 14:45	EPA 200.8-1994, Rev. 5.4
Calcium	141	mg/L	1	0.05	0.02		ELT	09/09/2024 14:45	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-12D
Customer Description:
Lab Number: 242603-006
Preparation:
Date Collected: 08/26/2024 16:13 EDT
Date Received: 08/29/2024 10:05 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	512	mg/L	25	8	2		CRJ	09/04/2024 01:03	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	6.40	mg/L	1	0.050	0.007		ELT	09/09/2024 14:50	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242603 **Customer: Northeastern 3&4 Power Station** **Date Reported: 09/12/2024**

Customer Sample ID: MW-15 Customer Description:
Lab Number: 242603-007 Preparation:
Date Collected: 08/26/2024 17:05 EDT Date Received: 08/29/2024 10:05 EDT

Ion Chromatography

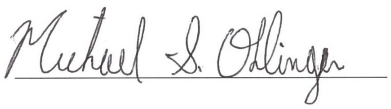
Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Sulfate	638	mg/L	25	8	2		CRJ	09/04/2024 02:09	EPA 300.1 -1997, Rev. 1.0

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	6.69	mg/L	1	0.050	0.007		ELT	09/09/2024 14:55	EPA 200.8-1994, Rev. 5.4

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE PS LF CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 242603

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 BORON	250 mL bottle, pH<2, HNO3 BORON, CALCIUM	250 mL bottle, Cool 0-6C SULFATE	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 Hg	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn		Sample Specific Notes:
MW-3D	8/26/2024	1409	G	GW	2		X		X				
MW-4D	8/26/2024	1336	G	GW	2		X		X				
MW-5D	8/26/2024	1622	G	GW	1				X				
MW-6D	8/26/2024	1434	G	GW	2		X		X				
MW-9D	8/26/2024	1520	G	GW	2			X	X				
MW-12D	8/26/2024	1513	G	GW	2		X		X				
MW-15	8/26/2024	1605	G	GW	2		X		X				
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company: EAGLE	Date/Time: 08/28/24 1200	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: Michael Ohlinger	Date/Time: 8/29/24 10:05

WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102 Sample Receipt Form Rev 8, 08/23/24

Package Type	Delivery Type
(Cooler) Box Bag Envelope	UPS (FedEX) USPS
	Other _____

Plant/Customer NE PS LF CCR **Total # of Containers RECEIVED in Job:** 13

Opened By BLB

Date/Time 10:05

Were all temperatures within 0-6°C? (Y) / N or N/A (Temps) **Initial:** BLB (on ice) / no ice

If No, specify each deviation(s) on back of form. (IR Gun Ser# 240009843, *Expir.* 01-03-2026)

Was container in good condition? (Y) / N Comments

Was Chain of Custody received? (Y) / N Comments

Requested turnaround: Routine If **RUSH**, who was notified?

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was pH checked & Color Coding done? (Y) / N or N/A (pH) **Initial & Date:** BLB 8.29.24

pH paper: mfr:LabRat,PN: 4801,LOT#X000RWDG21 exp.11-30-25 ** ***Note changes to pH paper in comments below***

Was Add'l Preservative needed? Y (/ N) If Yes: By whom & when: _____ (See Prep Book)

(Dissolved) Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 242603

Comments: _____

Logged by MSO

(Record Test Count on back of form)

Total # of Containers LISTED on COC: 13

WATER & WASTE SAMPLE RECEIPT FORM (CONT)

Form SOP-7102 Sample Receipt Form Rev 8, 08 23 24

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the Sample or Job "Comments" field in the LIMS. **Comments below**.
i.e. Mark "LF" if needs Lab filtered, Temperature or Preservative deviation, Preserved upon arrival , etc.

JOB # : L42603 **Initial/ Date:** MSD 8/29/24

Login Test Count from COC	LIMS Sample ID (or COC Sample Name)	Comments /Nonconformities	Peer Review Test Count from COC
2	242603 -001		2
2	-002		2
1	-003		1
2	-004		2
3	-005		3
2	-006		2
2	-007		2

9/5/24

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242606 **Customer: Northeastern 3&4 Power Station** **Date Reported: 09/11/2024**

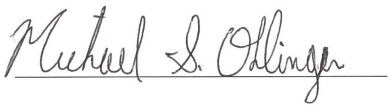
Customer Sample ID: MW-5D
Customer Description:
Lab Number: 242606-001
Preparation:
Date Collected: 08/26/2024 17:22 EDT
Date Received: 08/29/2024 10:05 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.427	mg/L	1	0.050	0.007		ELT	09/09/2024 15:11	EPA 200.8-1994, Rev. 5.4

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE PS LF CCR sampling
Contact Name: Rebecca Jones
Contact Phone: 737-330-3725
Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 242606

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 BORON	250 mL bottle, pH<2, HNO3 BORON, CALCIUM	250 mL bottle, Cool 0-6C SULFATE	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 Hg	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn		Sample Specific Notes:
MW-5D	8/26/2024	1622	G	GW	1		X						
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	EAGLE	08/26/24 1200		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 8/29/24 10:05

WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102 Sample Receipt Form Rev.8, 08/23/24

Package Type	Delivery Type
Cooler Box Bag Envelope	UPS FedEX USPS
	Other _____

Plant/Customer NE PS LF CCR **Total # of Containers RECEIVED in Job:** 1

Opened By BLB

Date/Time 10:05

Were all temperatures within 0-6°C? Y / N or N/A (Temps) **Initial:** BLB or (ice) / no ice

If No, specify each deviation(s) on back of form. (IR Gun Ser# 240009843, *Expir.* 01-03-2026)

Was container in good condition? (Y) / N Comments

Was Chain of Custody received? (Y) / N Comments

Requested turnaround: Routine If **RUSH**, who was notified?

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was pH checked & Color Coding done? (Y) N or N/A (pH) **Initial & Date:** BLB 8-29-24

pH paper: mfr:LabRat,PN: 4801,LOT#X000RWDG21 exp.11-30-25 ** ***Note changes to pH paper in comments below***

Was Add'l Preservative needed? Y (N) If Yes: By whom & when: _____ (See Prep Book)

(Dissolved) Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 242606

Comments: _____

Logged by MSD

(Record Test Count on back of form)

Total # of Containers LISTED on COC: 1

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 242604 **Customer: Northeastern 3&4 Power Station** **Date Reported: 09/12/2024**

Customer Sample ID: MW-4D
Customer Description:
Lab Number: 242604-001
Preparation:
Date Collected: 08/26/2024 14:36 EDT
Date Received: 08/29/2024 10:05 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	170	mg/L	1	0.05	0.02		ELT	09/09/2024 15:00	EPA 200.8-1994, Rev. 5.4

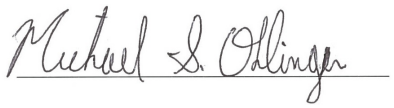
Customer Sample ID: MW-6D
Customer Description:
Lab Number: 242604-002
Preparation:
Date Collected: 08/26/2024 15:34 EDT
Date Received: 08/29/2024 10:05 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Calcium	171	mg/L	1	0.05	0.02		ELT	09/09/2024 15:06	EPA 200.8-1994, Rev. 5.4

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE PS LF CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Analysis Turnaround Time (In Calendar Days)
Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 2426054

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 CALCIUM	250 mL bottle, pH<2, HNO3 BORON, CALCIUM	250 mL bottle, Cool 0-6C SULFATE	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 Hg	Field-filter 500 mL bottle, then pH<2, HNO_3 dissolved Fe and Mn		Sample Specific Notes:
MW-4D	8/26/2024	1336	G	GW	1		X						
MW-6D	8/26/2024	1434	G	GW	1		X						
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4				

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by: [signature]	Company: EAGLE	Date/Time: 08/28/24 1700	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Date/Time: 8/29/24 10:05

WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102 Sample Receipt Form Rev 8, 08/23/24

Package Type	Delivery Type
Cooler Box Bag Envelope	UPS FedEX USPS
	Other _____

Plant/Customer NE PS LF CCR **Total # of Containers RECEIVED in Job:** 2

Opened By MK / BLB

Date/Time 10:05

Were all temperatures within 0-6°C? Y / N or N/A (Temps) **Initial:** BLB on ice / no ice

If No, specify each deviation(s) on back of form. (IR Gun Ser# 240009843, *Expir.* 01-03-2026)

Was container in good condition? (Y) / N Comments

Was Chain of Custody received? (Y) / N Comments

Requested turnaround: - Routine If **RUSH**, who was notified?

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was pH checked & Color Coding done? (Y) / N or N/A (pH) **Initial & Date:** BLB 8-29-24

pH paper: mfr:LabRat,PN: 4801,LOT#X000RWDG21 exp.11-30-25 ** ***Note changes to pH paper in comments below***

Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

(Dissolved) Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 242604

Comments: _____

Logged by MSD

(Record Test Count on back of form)

Total # of Containers LISTED on COC: 2

WATER & WASTE SAMPLE RECEIPT FORM (CONT)

Form SOP-7102 Sample Receipt Form Rev 8, 08 23 24

REMINDER Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the Sample or Job "Comments" field in the LIMS **Comments below**

i.e. Mark "LF" if needs Lab filtered, Temperature or Preservative deviation, Preserved upon arrival, etc

JOB #: 242604 **Initial/ Date:** MSD 8/29/24

Login Test Count from COC	LIMS Sample ID (or COC Sample Name)	Comments /Nonconformities	Peer Review Test Count from COC
1	242604-001		1
1	242604-002		1
			MP 9/5/24

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243185 **Customer: Northeastern 3&4 Power Station** **Date Reported: 12/03/2024**

Customer Sample ID: MW-3D
Customer Description:
Lab Number: 243185-001
Preparation:
Date Collected: 10/22/2024 10:47 EDT
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.815	mg/L	1	0.050	0.007		ELH	11/12/2024 17:37	EPA 200.8-1994, Rev. 5.4
Calcium	117	mg/L	50	3	1		ELH	11/25/2024 22:42	EPA 200.8-1994, Rev. 5.4
Magnesium	40.6	mg/L	50	5.0	0.5		ELH	11/25/2024 22:42	EPA 200.8-1994, Rev. 5.4
Potassium	1.76	mg/L	1	0.10	0.01		ELH	11/12/2024 17:37	EPA 200.8-1994, Rev. 5.4
Sodium	52	mg/L	50	10	1		ELH	11/12/2024 17:32	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-4D
Customer Description:
Lab Number: 243185-002
Preparation:
Date Collected: 10/22/2024 09:34 EDT
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.583	mg/L	1	0.050	0.007		ELH	11/12/2024 17:48	EPA 200.8-1994, Rev. 5.4
Calcium	209	mg/L	50	3	1		ELH	11/25/2024 22:47	EPA 200.8-1994, Rev. 5.4
Magnesium	28.4	mg/L	50	5.0	0.5		ELH	11/25/2024 22:47	EPA 200.8-1994, Rev. 5.4
Potassium	2.01	mg/L	1	0.10	0.01		ELH	11/12/2024 17:48	EPA 200.8-1994, Rev. 5.4
Sodium	63	mg/L	50	10	1		ELH	11/12/2024 17:43	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-5D
Customer Description:
Lab Number: 243185-003
Preparation:
Date Collected: 10/22/2024 13:13 EDT
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.409	mg/L	1	0.050	0.007		ELH	11/12/2024 17:59	EPA 200.8-1994, Rev. 5.4
Calcium	121	mg/L	50	3	1		ELH	11/25/2024 22:53	EPA 200.8-1994, Rev. 5.4
Magnesium	43.4	mg/L	50	5.0	0.5		ELH	11/25/2024 22:53	EPA 200.8-1994, Rev. 5.4
Potassium	0.96	mg/L	1	0.10	0.01		ELH	11/12/2024 17:59	EPA 200.8-1994, Rev. 5.4
Sodium	35	mg/L	50	10	1		ELH	11/12/2024 17:54	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243185 **Customer: Northeastern 3&4 Power Station** **Date Reported: 12/03/2024**

Customer Sample ID: MW-6D
Lab Number: 243185-004
Date Collected: 10/22/2024 11:25 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	2.31	mg/L	1	0.050	0.007		ELH	11/12/2024 06:53	EPA 200.8-1994, Rev. 5.4
Calcium	90.8	mg/L	1	0.05	0.02		ELH	11/12/2024 06:53	EPA 200.8-1994, Rev. 5.4
Magnesium	32.0	mg/L	1	0.100	0.009		ELH	11/12/2024 06:53	EPA 200.8-1994, Rev. 5.4
Potassium	2.69	mg/L	1	0.10	0.01		ELH	11/12/2024 06:53	EPA 200.8-1994, Rev. 5.4
Sodium	134	mg/L	50	10	1		ELH	11/12/2024 06:47	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-9D
Lab Number: 243185-005
Date Collected: 10/22/2024 12:04 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	4.85	mg/L	1	0.050	0.007		ELH	11/12/2024 07:04	EPA 200.8-1994, Rev. 5.4
Calcium	91.4	mg/L	1	0.05	0.02		ELH	11/12/2024 07:04	EPA 200.8-1994, Rev. 5.4
Magnesium	44.3	mg/L	1	0.100	0.009		ELH	11/12/2024 07:04	EPA 200.8-1994, Rev. 5.4
Potassium	4.02	mg/L	1	0.10	0.01		ELH	11/12/2024 07:04	EPA 200.8-1994, Rev. 5.4
Sodium	140	mg/L	50	10	1		ELH	11/12/2024 06:58	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-12D
Lab Number: 243185-006
Date Collected: 10/22/2024 16:06 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	5.77	mg/L	1	0.050	0.007		ELH	11/11/2024 21:35	EPA 200.8-1994, Rev. 5.4
Calcium	101	mg/L	1	0.05	0.02		ELH	11/11/2024 21:35	EPA 200.8-1994, Rev. 5.4
Magnesium	7.01	mg/L	1	0.100	0.009		ELH	11/11/2024 21:35	EPA 200.8-1994, Rev. 5.4
Potassium	1.81	mg/L	1	0.10	0.01		ELH	11/11/2024 21:35	EPA 200.8-1994, Rev. 5.4
Sodium	228	mg/L	50	10	1		ELH	11/11/2024 21:30	EPA 200.8-1994, Rev. 5.4

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243185 **Customer: Northeastern 3&4 Power Station** **Date Reported: 12/03/2024**

Customer Sample ID: MW-13D
Lab Number: 243185-007
Date Collected: 10/22/2024 15:25 EDT

Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.827	mg/L	1	0.050	0.007		ELH	11/11/2024 21:46	EPA 200.8-1994, Rev. 5.4
Calcium	86.0	mg/L	1	0.05	0.02		ELH	11/11/2024 21:46	EPA 200.8-1994, Rev. 5.4
Magnesium	38.7	mg/L	1	0.100	0.009		ELH	11/11/2024 21:46	EPA 200.8-1994, Rev. 5.4
Mercury	<2	ng/L	1	5	2	U1	RLP	11/01/2024 00:00	EPA 245.7-2005, Rev. 2.0
Potassium	1.52	mg/L	1	0.10	0.01		ELH	11/11/2024 21:46	EPA 200.8-1994, Rev. 5.4
Sodium	75	mg/L	50	10	1		ELH	11/11/2024 21:41	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.87	pCi/L	0.13	0.16	O3	ST	11/25/2024 08:10	SW-846 9315-1986, Rev. 0
Carrier Recovery	99.6	%						
Radium-228	2.25	pCi/L	0.15	0.41	O2	ST	11/18/2024 17:44	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	74.5	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

AMERICAN ELECTRIC POWER

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Water Analysis Report

Job ID: 243185 **Customer: Northeastern 3&4 Power Station** **Date Reported: 12/03/2024**

Customer Sample ID: MW-14
Lab Number: 243185-008
Date Collected: 10/22/2024 13:47 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.267	mg/L	1	0.050	0.007		ELH	11/11/2024 21:57	EPA 200.8-1994, Rev. 5.4
Calcium	102	mg/L	1	0.05	0.02		ELH	11/11/2024 21:57	EPA 200.8-1994, Rev. 5.4
Magnesium	8.71	mg/L	1	0.100	0.009		ELH	11/11/2024 21:57	EPA 200.8-1994, Rev. 5.4
Potassium	8.49	mg/L	1	0.10	0.01		ELH	11/11/2024 21:57	EPA 200.8-1994, Rev. 5.4
Sodium	370	mg/L	1000	200	20		ELH	11/27/2024 12:08	EPA 200.8-1994, Rev. 5.4

Radiochemistry

Parameter	Result	Units	UNC*(+/-)	MDA*	Data Qualifiers	Analyst	Analysis Date	Method
Radium-226	0.58	pCi/L	0.13	0.23	03	ST	11/25/2024 08:10	SW-846 9315-1986, Rev. 0
Carrier Recovery	86.0	%						
Radium-228	-0.13	pCi/L	0.14	0.48	02	ST	11/18/2024 17:44	SW-846 9320-2014, Rev. 1.0
Carrier Recovery	75.4	%						

* The Required Detection Limit (RDL) is equivalent to the RL and for Radium-226 and Radium-228, the RDL is calculated to be 1.0 pCi/L. The Minimal Detectable Activity (MDA) listed with these results is sample specific and empirical. The combined standard uncertainty (UNC) is a counting uncertainty representing "one-sigma" which has the same units of measurement as the result.

Customer Sample ID: MW-15
Lab Number: 243185-009
Date Collected: 10/22/2024 12:36 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	6.19	mg/L	1	0.050	0.007		ELH	11/11/2024 22:08	EPA 200.8-1994, Rev. 5.4
Calcium	124	mg/L	1	0.05	0.02		ELH	11/11/2024 22:08	EPA 200.8-1994, Rev. 5.4
Magnesium	36.5	mg/L	1	0.100	0.009		ELH	11/11/2024 22:08	EPA 200.8-1994, Rev. 5.4
Potassium	2.06	mg/L	1	0.10	0.01		ELH	11/11/2024 22:08	EPA 200.8-1994, Rev. 5.4
Sodium	142	mg/L	50	10	1		ELH	11/11/2024 22:03	EPA 200.8-1994, Rev. 5.4

Dolan Chemical Laboratory
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Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243185 **Customer: Northeastern 3&4 Power Station** **Date Reported: 12/03/2024**

Customer Sample ID: MW-18
Lab Number: 243185-010
Date Collected: 10/22/2024 18:04 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	1.2	mg/L	50	2.5	0.4	J1	ELH	11/12/2024 08:58	EPA 200.8-1994, Rev. 5.4
Calcium	482	mg/L	50	3	1		ELH	11/12/2024 08:58	EPA 200.8-1994, Rev. 5.4
Magnesium	162	mg/L	50	5.0	0.5		ELH	11/12/2024 08:58	EPA 200.8-1994, Rev. 5.4
Potassium	25.7	mg/L	50	5.0	0.5		ELH	11/12/2024 08:58	EPA 200.8-1994, Rev. 5.4
Sodium	6000	mg/L	5000	1000	100		ELH	11/27/2024 12:13	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: MW-19
Lab Number: 243185-011
Date Collected: 10/22/2024 18:36 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	1.4	mg/L	50	2.5	0.4	J1	ELH	11/12/2024 09:04	EPA 200.8-1994, Rev. 5.4
Calcium	963	mg/L	50	3	1		ELH	11/12/2024 09:04	EPA 200.8-1994, Rev. 5.4
Magnesium	411	mg/L	50	5.0	0.5		ELH	11/12/2024 09:04	EPA 200.8-1994, Rev. 5.4
Potassium	25.3	mg/L	50	5.0	0.5		ELH	11/12/2024 09:04	EPA 200.8-1994, Rev. 5.4
Sodium	8150	mg/L	1000	200	20		ELH	11/27/2024 12:24	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: LANDFILL DUPLICATE
Lab Number: 243185-012
Date Collected: 10/22/2024 13:30 EDT
Customer Description:
Preparation:
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	0.4	mg/L	50	2.5	0.4	J1	ELH	11/12/2024 09:09	EPA 200.8-1994, Rev. 5.4
Calcium	123	mg/L	50	3	1		ELH	11/12/2024 09:09	EPA 200.8-1994, Rev. 5.4
Magnesium	42.6	mg/L	50	5.0	0.5		ELH	11/12/2024 09:09	EPA 200.8-1994, Rev. 5.4
Potassium	1.1	mg/L	50	5.0	0.5	J1	ELH	11/12/2024 09:09	EPA 200.8-1994, Rev. 5.4
Sodium	36	mg/L	50	10	1		ELH	11/12/2024 09:09	EPA 200.8-1994, Rev. 5.4

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
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Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 243185 **Customer: Northeastern 3&4 Power Station** **Date Reported: 12/03/2024**

Customer Sample ID: LANDFILL EQUIPMENT BLANK
Customer Description:
Lab Number: 243185-013
Preparation:
Date Collected: 10/22/2024 12:12 EDT
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.007	mg/L	1	0.050	0.007	U1	ELH	11/12/2024 09:15	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	ELH	11/12/2024 09:15	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	ELH	11/12/2024 09:15	EPA 200.8-1994, Rev. 5.4
Potassium	0.01	mg/L	1	0.10	0.01	J1	ELH	11/12/2024 09:15	EPA 200.8-1994, Rev. 5.4
Sodium	<0.02	mg/L	1	0.20	0.02	U1	ELH	11/12/2024 09:15	EPA 200.8-1994, Rev. 5.4

Customer Sample ID: FIELD BLANK
Customer Description:
Lab Number: 243185-014
Preparation:
Date Collected: 10/22/2024 13:52 EDT
Date Received: 10/28/2024 11:40 EDT

Metals

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Boron	<0.007	mg/L	1	0.050	0.007	U1	ELH	11/12/2024 09:20	EPA 200.8-1994, Rev. 5.4
Calcium	<0.02	mg/L	1	0.05	0.02	U1	ELH	11/12/2024 09:20	EPA 200.8-1994, Rev. 5.4
Magnesium	<0.009	mg/L	1	0.100	0.009	U1	ELH	11/12/2024 09:20	EPA 200.8-1994, Rev. 5.4
Potassium	<0.01	mg/L	1	0.10	0.01	U1	ELH	11/12/2024 09:20	EPA 200.8-1994, Rev. 5.4
Sodium	<0.02	mg/L	1	0.20	0.02	U1	ELH	11/12/2024 09:20	EPA 200.8-1994, Rev. 5.4

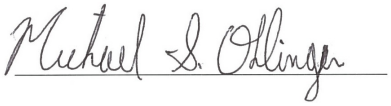
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243185 **Customer: Northeastern 3&4 Power Station** **Date Reported: 12/03/2024**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

U1 - Not detected at or below method detection limit (MDL).
O3 - Insufficient sample was received to perform the duplicate analysis with this sample batch.
O2 - Insufficient sample was received to perform the MS and duplicate analyses with this sample batch.
J1 - Concentration estimated. Analyte was detected between the method detection limit and the reporting limit.

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE LF Semi-Annual CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 203185

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 HG	250 mL bottle, pH<2, HNO_3 As, B, Ba, Be, Ca,Cd, Cr, Co,K, Li, Na, Pb, Mg, Mo, Sb, Se, TL	Sample Specific Notes:
MW-3D	10/22/2024	947	G	GW	1		X					
MW-4D	10/22/2024	834	G	GW	1		X					
MW-5D	10/22/2024	1213	G	GW	1		X					
MW-6D	10/22/2024	1025	G	GW	1		X					
MW-9D	10/22/2024	1104	G	GW	1		X					
MW-12D	10/22/2024	1506	G	GW	1		X					
MW-13D	10/22/2024	1425	G	GW	5		X		X	X		
MW-14	10/22/2024	1247	G	GW	4		X		X			
MW-15	10/22/2024	1136	G	GW	1		X					
MW-18	10/22/2024	1704	G	GW	1		X					
MW-19	10/22/2024	1736	G	GW	1		X					
LANDFILL DUPLICATE	10/22/2024	1230	G	GW	1		X					
LANDFILL EQUIPMENT BLANK	10/22/2024	1112	G	W	1		X					
FIELD BLANK	10/22/2024	1252	G	W	1		X					
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4			

* *Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	EAGLE	10/25/24 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
			[signature]	10/28/24 11:46

WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102 Sample Receipt Form Rev.9, 10/07/24

Package Type	Delivery Type
(Cooler) Box Bag Envelope	(UPS) FedEX USPS
	Other _____

Plant/Customer Northeastern **Total # of Containers RECEIVED in Job:** 21

Opened By MGK

Date/Time 10/28/24 11:40am

Were all temperatures within 0-6°C? Y / N or (N/A) (Temps) **Initial:** MGK on ice / (no ice)

If No, specify each deviation(s) on back of form. (IR Gun Ser# 240093386, *Expir.* 01/31/2026)

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was pH checked & Color Coding done? (Y) / N or N/A (pH) **Initial & Date:** BLB 10/28/24

pH paper: mfr LabRat ,PN 4801 ,LOT# X000RWDG21 ,EXPIR DATE 11/30/2025

*** Note changes to pH paper in comments below***

Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

(Dissolved) Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was COC filled out properly? (Y) / N Comments _____

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was the customer contacted? If Yes: Person Contacted: _____

Initial & Date & Time : _____

Lab ID# 243185

Logged by VAL

(Record Test Count on back of form)

Comments: CoC unclear for Northeastern location; previous login used as difference

Total # of Containers LISTED on COC: 21

WATER & WASTE SAMPLE RECEIPT FORM (CONT)

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the Sample or Job "Comments" field in the LIMS. **Comments below**:
i.e. Mark "LF" if needs Lab filtered, Temperature or Preservative deviation, Preserved upon arrival , etc.

JOB # : 243185 **Initial/ Date:** 10/28/24 **Peer Review Initial/ Date:** WCG 10/29/24

Login Test Count from COC	LIMS Sample ID (or COC Sample Name)	Comments /Nonconformities	Peer Review Test Count from COC
5	243185 -001		5
5	-002		5
5	-003		5
5	-004		5
5	-005		5
5	-006		5
8	-007		8
7	-008		7
5	-009		5
5	-010		5
5	-011		5
5	-012		5
5	-013		5
5	-014		5

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243163 **Customer: Northeastern 3&4 Power Station** **Date Reported: 11/13/2024**

Customer Sample ID: MW-3D
Customer Description:
Lab Number: 243163-001
Preparation:
Date Collected: 10/22/2024 10:47 EDT
Date Received: 10/24/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.29	mg/L	2	0.10	0.02		CRJ	11/05/2024 17:40	EPA 300.1 -1997, Rev. 1.0
Chloride	13.0	mg/L	2	0.06	0.02		CRJ	11/05/2024 17:40	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.81	mg/L	2	0.06	0.02		CRJ	11/05/2024 17:40	EPA 300.1 -1997, Rev. 1.0
Sulfate	164	mg/L	10	3.0	0.6		CRJ	11/05/2024 14:56	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	418	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	590	mg/L	2	100	40		BLB	10/28/2024 08:06	SM 2540C-2015

Customer Sample ID: MW-4D
Customer Description:
Lab Number: 243163-002
Preparation:
Date Collected: 10/22/2024 09:34 EDT
Date Received: 10/24/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.58	mg/L	2	0.10	0.02		CRJ	11/05/2024 18:13	EPA 300.1 -1997, Rev. 1.0
Chloride	37.6	mg/L	2	0.06	0.02		CRJ	11/05/2024 18:13	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.25	mg/L	2	0.06	0.02		CRJ	11/05/2024 18:13	EPA 300.1 -1997, Rev. 1.0
Sulfate	302	mg/L	25	8	2		CRJ	11/05/2024 15:29	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	360	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	860	mg/L	2	100	40		BLB	10/28/2024 08:13	SM 2540C-2015

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243163 **Customer: Northeastern 3&4 Power Station** **Date Reported: 11/13/2024**

Customer Sample ID: MW-5D **Customer Description:**
Lab Number: 243163-003 **Preparation:**
Date Collected: 10/22/2024 13:13 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.15	mg/L	2	0.10	0.02		CRJ	11/05/2024 23:10	EPA 300.1 -1997, Rev. 1.0
Chloride	25.6	mg/L	2	0.06	0.02		CRJ	11/05/2024 23:10	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.58	mg/L	2	0.06	0.02		CRJ	11/05/2024 23:10	EPA 300.1 -1997, Rev. 1.0
Sulfate	123	mg/L	10	3.0	0.6		CRJ	11/05/2024 16:02	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	377	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	560	mg/L	2	100	40		BLB	10/28/2024 08:13	SM 2540C-2015

Customer Sample ID: MW-6D **Customer Description:**
Lab Number: 243163-004 **Preparation:**
Date Collected: 10/22/2024 11:25 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.38	mg/L	2	0.10	0.02		CRJ	11/05/2024 23:43	EPA 300.1 -1997, Rev. 1.0
Chloride	27.0	mg/L	2	0.06	0.02		CRJ	11/05/2024 23:43	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.81	mg/L	2	0.06	0.02		CRJ	11/05/2024 23:43	EPA 300.1 -1997, Rev. 1.0
Sulfate	443	mg/L	25	8	2		CRJ	11/05/2024 16:35	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	394	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	1100	mg/L	2	100	40		BLB	10/28/2024 08:20	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243163 **Customer: Northeastern 3&4 Power Station** **Date Reported: 11/13/2024**

Customer Sample ID: MW-9D
Customer Description:
Lab Number: 243163-005
Preparation:
Date Collected: 10/22/2024 12:04 EDT
Date Received: 10/24/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.29	mg/L	2	0.10	0.02		CRJ	11/06/2024 00:48	EPA 300.1 -1997, Rev. 1.0
Chloride	23.4	mg/L	2	0.06	0.02		CRJ	11/06/2024 00:48	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.82	mg/L	2	0.06	0.02		CRJ	11/06/2024 00:48	EPA 300.1 -1997, Rev. 1.0
Sulfate	546	mg/L	25	8	2		CRJ	11/05/2024 19:19	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	348	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	1160	mg/L	2	100	40		BLB	10/28/2024 08:20	SM 2540C-2015

Customer Sample ID: MW-12D
Customer Description:
Lab Number: 243163-006
Preparation:
Date Collected: 10/22/2024 16:06 EDT
Date Received: 10/24/2024 10:00 EDT

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.36	mg/L	2	0.10	0.02		CRJ	11/06/2024 01:21	EPA 300.1 -1997, Rev. 1.0
Chloride	12.6	mg/L	2	0.06	0.02		CRJ	11/06/2024 01:21	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.71	mg/L	2	0.06	0.02		CRJ	11/06/2024 01:21	EPA 300.1 -1997, Rev. 1.0
Sulfate	474	mg/L	25	8	2		CRJ	11/05/2024 19:52	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	167	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	900	mg/L	2	100	40		BLB	10/28/2024 08:26	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 243163 **Customer: Northeastern 3&4 Power Station** **Date Reported: 11/13/2024**

Customer Sample ID: MW-13D **Customer Description:**
Lab Number: 243163-007 **Preparation:**
Date Collected: 10/22/2024 15:25 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.12	mg/L	2	0.10	0.02		CRJ	11/06/2024 13:00	EPA 300.1 -1997, Rev. 1.0
Chloride	6.36	mg/L	2	0.06	0.02		CRJ	11/06/2024 13:00	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.40	mg/L	2	0.06	0.02		CRJ	11/06/2024 13:00	EPA 300.1 -1997, Rev. 1.0
Sulfate	502	mg/L	25	8	2		CRJ	11/06/2024 05:45	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	463	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	1160	mg/L	2	100	40		BLB	10/28/2024 08:26	SM 2540C-2015

Customer Sample ID: MW-14 **Customer Description:**
Lab Number: 243163-008 **Preparation:**
Date Collected: 10/22/2024 13:47 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	2.9	mg/L	25	1.3	0.3		CRJ	11/06/2024 04:39	EPA 300.1 -1997, Rev. 1.0
Chloride	890	mg/L	250	8	3		CRJ	11/06/2024 04:06	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.9	mg/L	25	0.8	0.3		CRJ	11/06/2024 04:39	EPA 300.1 -1997, Rev. 1.0
Sulfate	90	mg/L	25	8	2		CRJ	11/06/2024 04:39	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	608	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	2400	mg/L	20	1000	400		BLB	10/28/2024 08:32	SM 2540C-2015

AMERICAN ELECTRIC POWER

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Water Analysis Report

Job ID: 243163 **Customer: Northeastern 3&4 Power Station** **Date Reported: 11/13/2024**

Customer Sample ID: MW-15 **Customer Description:**
Lab Number: 243163-009 **Preparation:**
Date Collected: 10/22/2024 12:36 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.32	mg/L	2	0.10	0.02		CRJ	11/06/2024 13:33	EPA 300.1 -1997, Rev. 1.0
Chloride	15.7	mg/L	2	0.06	0.02		CRJ	11/06/2024 13:33	EPA 300.1 -1997, Rev. 1.0
Fluoride	1.28	mg/L	2	0.06	0.02		CRJ	11/06/2024 13:33	EPA 300.1 -1997, Rev. 1.0
Sulfate	608	mg/L	25	8	2		CRJ	11/06/2024 06:18	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	154	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	1080	mg/L	2	100	40		BLB	10/28/2024 08:32	SM 2540C-2015

Customer Sample ID: MW-18 **Customer Description:**
Lab Number: 243163-010 **Preparation:**
Date Collected: 10/22/2024 18:04 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	34.4	mg/L	50	2.5	0.5		CRJ	11/06/2024 10:16	EPA 300.1 -1997, Rev. 1.0
Chloride	8650	mg/L	2500	80	30		CRJ	11/06/2024 09:43	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.8	mg/L	50	1.5	0.5	J1	CRJ	11/06/2024 10:16	EPA 300.1 -1997, Rev. 1.0
Sulfate	1420	mg/L	50	15	3		CRJ	11/06/2024 10:16	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	943	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	18700	mg/L	20	1000	400		BLB	10/28/2024 08:39	SM 2540C-2015

Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243163 **Customer: Northeastern 3&4 Power Station** **Date Reported: 11/13/2024**

Customer Sample ID: MW-19 **Customer Description:**
Lab Number: 243163-011 **Preparation:**
Date Collected: 10/22/2024 18:36 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	53.6	mg/L	50	2.5	0.5		CRJ	11/06/2024 11:55	EPA 300.1 -1997, Rev. 1.0
Chloride	14800	mg/L	2500	80	30		CRJ	11/06/2024 11:22	EPA 300.1 -1997, Rev. 1.0
Fluoride	3.0	mg/L	50	1.5	0.5		CRJ	11/06/2024 11:55	EPA 300.1 -1997, Rev. 1.0
Sulfate	7	mg/L	50	15	3	J1	CRJ	11/06/2024 11:55	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	540	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	23400	mg/L	20	1000	400		BLB	10/28/2024 08:39	SM 2540C-2015

Customer Sample ID: LANDFILL DUPLICATE **Customer Description:**
Lab Number: 243163-012 **Preparation:**
Date Collected: 10/22/2024 13:30 EDT **Date Received: 10/24/2024 10:00 EDT**

Ion Chromatography

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Bromide	0.16	mg/L	2	0.10	0.02		CRJ	11/05/2024 13:50	EPA 300.1 -1997, Rev. 1.0
Chloride	25.4	mg/L	2	0.06	0.02		CRJ	11/05/2024 13:50	EPA 300.1 -1997, Rev. 1.0
Fluoride	0.59	mg/L	2	0.06	0.02		CRJ	11/05/2024 13:50	EPA 300.1 -1997, Rev. 1.0
Sulfate	113	mg/L	25	8	2		CRJ	11/05/2024 13:17	EPA 300.1 -1997, Rev. 1.0

Wet Chemistry

Parameter	Result	Units	Dilution	RL	MDL	Data Qualifiers	Analyst	Analysis Date	Method
Alkalinity, as CaCO3	383	mg/L	1	20	5		MGK	10/28/2024 14:49	SM 2320B-2011
TDS, Filterable Residue	550	mg/L	2	100	40		BLB	10/28/2024 08:45	SM 2540C-2015

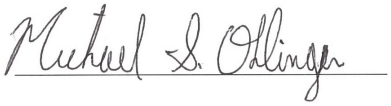
Water Analysis Report

Dolan Chemical Laboratory
4001 Bixby Road
Groveport, OH 43125
Phone: 614-836-4221
Audinet: 210-4221

Job ID: 243163 **Customer: Northeastern 3&4 Power Station** **Date Reported: 11/13/2024**

Report Verification

This report and the above data have been confirmed by the following analyst.



Michael Ohlinger, Chemist
Email: msohlinger@aep.com
Phone: 614-836-4184
Audinet: 8-210-4184

Data Qualifer Legend

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

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE LF Semi-Annual CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 243163

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg	1 L bottle, Cool, 0-6°C TDS, F, Cl, SO_4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 HG	250 mL bottle, pH<2, HNO_3 As, B, Ba, Be, Ca,Cd, Cr, Co,K, Li, Na, Pb, Mg, Mo, Sb, Se, TL	Sample Specific Notes:
MW-3D				GW	1			X				
MW-4D				GW	1			X				
MW-5D				GW	1			X				
MW-6D				GW	1			X				
MW-9D				GW	1			X				
MW-12D				GW	1			X				
MW-13D				GW	1			X				
MW-14				GW	1			X				
MW-15				GW	1			X				
MW-18				GW	1			X				
MW-19				GW	1			X				
LANDFILL DUPLICATE				GW	1			X				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4			

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:

Relinquished by:	Company: ERG LF	Date/Time: 10/23/24 1400	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: 10/24/24

Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Dolan Chemical Laboratory (DCL)
4001 Bixby Road
Groveport, Ohio 43125
Contacts: Jonathan Barnhill (318-673-3803)
Michael Ohlinger (614-836-4184)

Project Name: NE LF Semi-Annual CCR sampling

Contact Name: Rebecca Jones

Contact Phone: 737-330-3725

Sampler(s): Kenny McDonald

Analysis Turnaround Time (in Calendar Days)
Routine (28 days for Monitoring Wells)

Site Contact:

Date:

For Lab Use Only:
COC/Order #: 243163

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO_3 B, Ca, Na, K, Mg	1 L bottle, Cool. 0-6°C TDS, F, Cl, SO_4, Br, Alkalinity	Three (six every 10th*) 1 L bottles, pH<2, HNO_3 Ra-226, Ra-228	250 mL Glass or 125/250 mL PTFE lined bottle, HCL**, pH<2 HG	250 mL bottle, pH<2, HNO_3 As, B, Ba, Be, Ca,Cd, Cr, Co,K, Li, Na, Pb, Mg, Mo, Sb, Se, TL	Sample Specific Notes:
MW-3D	10/22/24	0947		GW	1			X				
MW-4D		0834		GW	1			X				
MW-5D		1213		GW	1			X				
MW-6D		1015		GW	1			X				
MW-9D		1104		GW	1			X				
MW-12D		1506		GW	1			X				
MW-13D		1425		GW	1			X				
MW-14		1247		GW	1			X				
MW-15		1136		GW	1			X				
MW-18		1404		GW	1			X				
MW-19		1736		GW	1			X				
LANDFILL DUPLICATE		1230		GW	1			X				
Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____; F= filter in field							4	1	4			

** Six 1L Bottles must be collected for Radium for every 10th sample.*

Special Instructions/QC Requirements & Comments:
Dates/Times taken from bottles - MSJ 10/24/24

Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
[signature]	AEGLF	10/23/24 1400		
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:

WATER & WASTE SAMPLE RECEIPT FORM

Form SOP-7102 Sample Receipt Form Rev.9, 10/07/24

Package Type	Delivery Type
Cooler Box Bag Envelope	UPS (FedEX) USPS
	Other _____

Plant/Customer Northeastern **Total # of Containers RECEIVED in Job:** 12

Opened By WLG

Date/Time 10/24/24 1009

Were all temperatures within 0-6°C? (Y) / N or N/A (Temps) **Initial:** WLG on (ice) / no ice

If No, specify each deviation(s) on back of form. (IR Gun Ser# 240093386, *Expir.* 01/31/2026)

Was container in good condition? (Y) / N Comments _____

Was Chain of Custody received? (Y) / N Comments _____

Requested turnaround: Routine If **RUSH**, who was notified? _____

pH (15 min) Cr^{+6} (pres) (24 hr) NO_2 or NO_3 (48 hr) *ortho*-PO_4 (48 hr) Hg-diss (pres) (48 hr)

Was pH checked & Color Coding done? (Y) / N or N/A (pH) **Initial & Date:** WLG 10/24/24

pH paper: mfr LabRat ,PN 4801 ,LOT# X000RWDG21 ,EXPIR DATE 11/30/2025

***** Note changes to pH paper in comments below***

Was Add'l Preservative needed? Y / (N) If Yes: By whom & when: _____ (See Prep Book)

(Dissolved) Is sample filtration requested? Y / (N) Comments _____ (See Prep Book)

Was COC filled out properly? (Y) / N Comments No dates / times

Were samples labeled properly? (Y) / N Comments _____

Were correct containers used? (Y) / N Comments _____

Was the customer contacted? If Yes: Person Contacted: Kenny Mcdonald

Initial & Date & Time : MSD 10/24/24

Lab ID# 242163

Comments: Kenny emailed a corrected COC.

Logged by MSD

(Record Test Count on back of form)

Total # of Containers LISTED on COC: 12

WATER & WASTE SAMPLE RECEIPT FORM (CONT)

REMINDER: Document the pertinent sample integrity information and deviations in sample receipt (as noted above) in the Sample or Job "Comments" field in the LIMS. **Comments below**:
i.e. Mark "LF" if needs Lab filtered, Temperature or Preservative deviation, Preserved upon arrival , etc.

JOB # : 243163 **Initial/ Date:** MBO 10/24/24 **Peer Review Initial/ Date:** WCG 10/24/24

Login Test Count from COC	LIMS Sample ID (or COC Sample Name)	Comments /Nonconformities	Peer Review Test Count from COC
6	243163 -001		6
	-002		
	-003		
	-004		
	-005		
	-006		
	-007		
	-008		
	-009		
	-010		
	-012		