

# **Annual Groundwater Monitoring Report**

Public Service Company of Oklahoma

Northeastern 3&4 Power Station

## **Landfill CCR Management Unit**

7300 E HWY 88

Oologah, Oklahoma

**January 2020**

Prepared by:

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1 Riverside Plaza

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An **AEP** Company

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BOUNDLESS ENERGY™

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## **I. Summary**

This *Annual Groundwater Monitoring Report* (Report) has been prepared to report the status of activities for the preceding year for an existing CCR unit at Public Service Company of Oklahoma's (PSO's), a wholly-owned subsidiary of American Electric Power Company (AEP), Northeastern 3&4 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, 2020.

In general, the following activities were completed:

- Semi-annual groundwater samples were collected and analyzed for detection monitoring Appendix A constituents, as specified in OAC 255:517-9-5 and AEP's *Groundwater Sampling and Analysis Plan*;
- NPS continues to evaluate the site for appropriate upgradient/background well placement;
- Eight background groundwater sampling events were completed for 4D, 5D, and 12D. Background and Upper Prediction Limits (UPLs) were established for these wells;
- A statistically significant increase (SSI) for Fluoride in MW-15 was determined for the 1<sup>st</sup> semi-annual 2018 sampling event;
- A successful alternate source demonstration (ASD) was conducted for a Fluoride SSI in MW-15;
- Groundwater data underwent various validation tests, including tests for completeness, valid values, transcription errors, and consistent units;
- Groundwater Monitoring Statistical Evaluation Reports to evaluate groundwater data were prepared in accordance with 252:517-9-4 and certified. The statistical process was guided by USEPA's *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* ("Unified Guidance", USEPA, 2009).
- This CCR Unit remained in detection monitoring during 2019.

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

- A map, aerial photograph or a drawing showing the CCR management unit(s), all groundwater monitoring wells and monitoring well identification numbers;
- Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a statement as to why that happened;
- 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 are included in Appendix I;

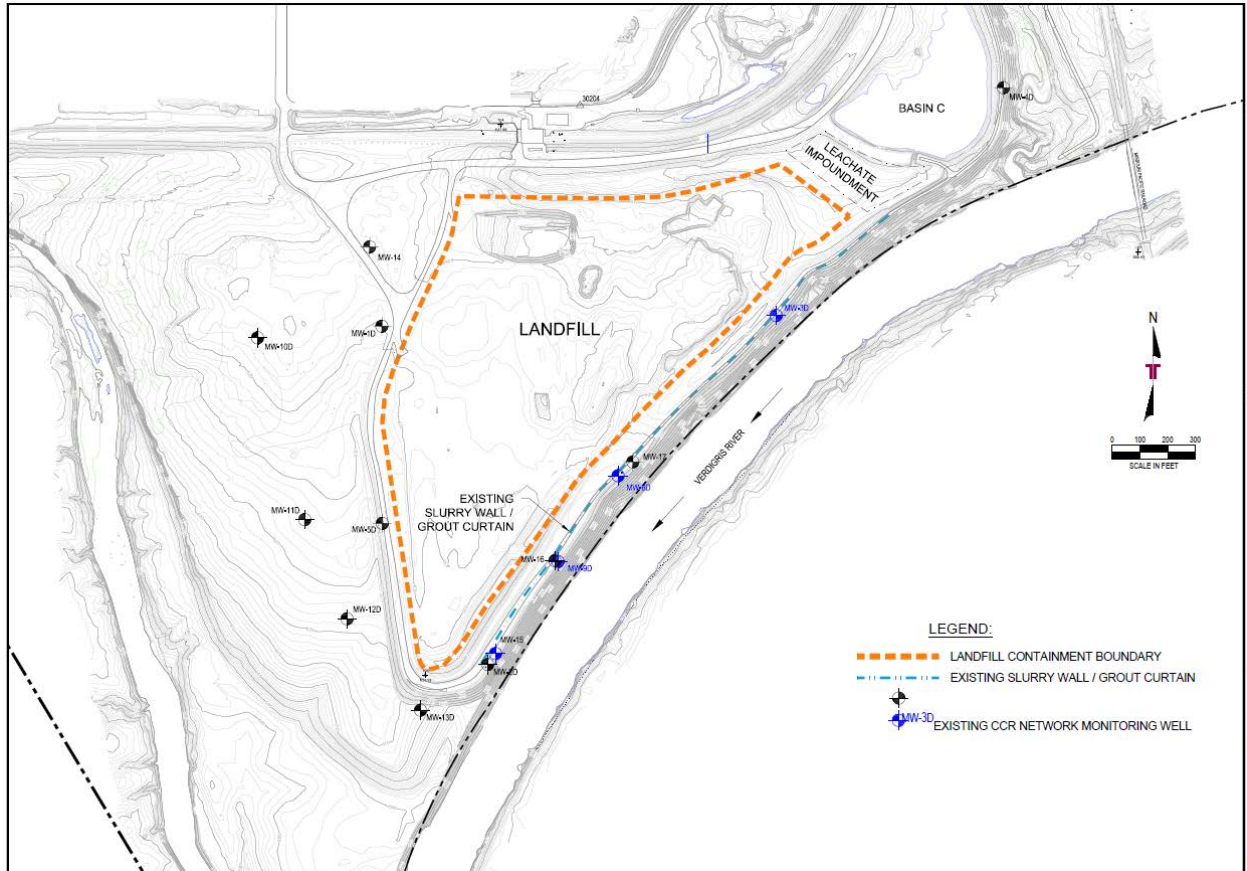
- Statistically reports are located in Appendix II;
- The ASDs are located in Appendix III.
- Field Sheets and Laboratory Reports are located in Appendix IV.

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	
Up Gradient	Down Gradient
Pending	MW-1D through MW-6D,
	MW-9D through MW-13D
	MW-14 through MW-17



**III. Monitoring Wells Installed or Decommissioned**

No monitoring wells were installed or decommissioned.

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

Appendix I contains tables showing the applicable groundwater data results obtained under OAC 252:517-9-1 through 252:517-9-5. Static water elevation data from each monitoring event are in Appendix I, along with the groundwater velocity, groundwater flow direction and potentiometric maps developed after each sampling event. Appendix IV contains the field sheets and laboratory reports for data relevant to this reporting period.

**V. Statistical Evaluation completed in 2019**

A SSI for Fluoride in MW-15 was determined for the 1<sup>st</sup> semi-annual 2018 sampling event.

No SSIs were determined for the 2<sup>nd</sup> semi-annual 2018 groundwater monitoring event.

No SSIs were determined for the 1<sup>st</sup> semi-annual 2019 or 2<sup>nd</sup> semi-annual 2019 groundwater monitoring events.

Background concentrations and UPLs were developed for Appendix A and B constituents, respectively for monitoring wells 4D, 5D, and 12D.

The statistical reports completed in 2019 are found in Appendix II.

**VI. Alternate Source Demonstrations completed in 2019**

ODEQ issued a Notice Of Deficiency (NOD) January 30, 2019 for the boron ASD submitted October 2018, which presented revised statistical results through intrawell 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. Until the background concentrations can be established, statistical analysis will be completed on intra-well comparison.

An ASD was conducted for the Fluoride SSI detected in MW-15 during May 2018 and confirmed in October 2018. The ASD was submitted to ODEQ in January 2019 and approved by ODEQ March 18, 2019. Appendix III contains the ASD.

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

This CCR Unit remained in detection monitoring during 2019.

The sampling frequency of twice per year will be maintained for the current monitoring program.

**VIII. Other Information Required**

Financial Assurance – Corporate Financial Test was accepted by ODEQ in correspondence dated April, 5, 2019.

**IX. Description of Any Problems Encountered in 2019 and Actions Taken**

As required by OAC 252:517-9-1(b)(1)(c), the collection of a minimum of eight independent samples for each downgradient well within the monitoring well network was not possible as wells 1D, 2D, 10D, 11D, 13D, 14, 16, and 17 continue to lack sufficient water volume for sample collection after allowing 24 hours of recharge.

NPS conducted sampling of SP-6 and SP-7 to determine their suitability as background monitoring wells for inter-well statistical analyses, which was approved by ODEQ Jan 11, 2019. However, the water quality of these wells was determined to be the same as MWs 7D and 8D, which were previously determined inappropriate background wells. On June 25, 2019, ODEQ agreed that SP-6 was not a suitable upgradient background monitoring well for the landfill. On September 12, 2019, ODEQ agreed that SP-7 was not a suitable upgradient background monitoring well for the landfill.

**X. A Projection of Key Activities for the Upcoming Year**

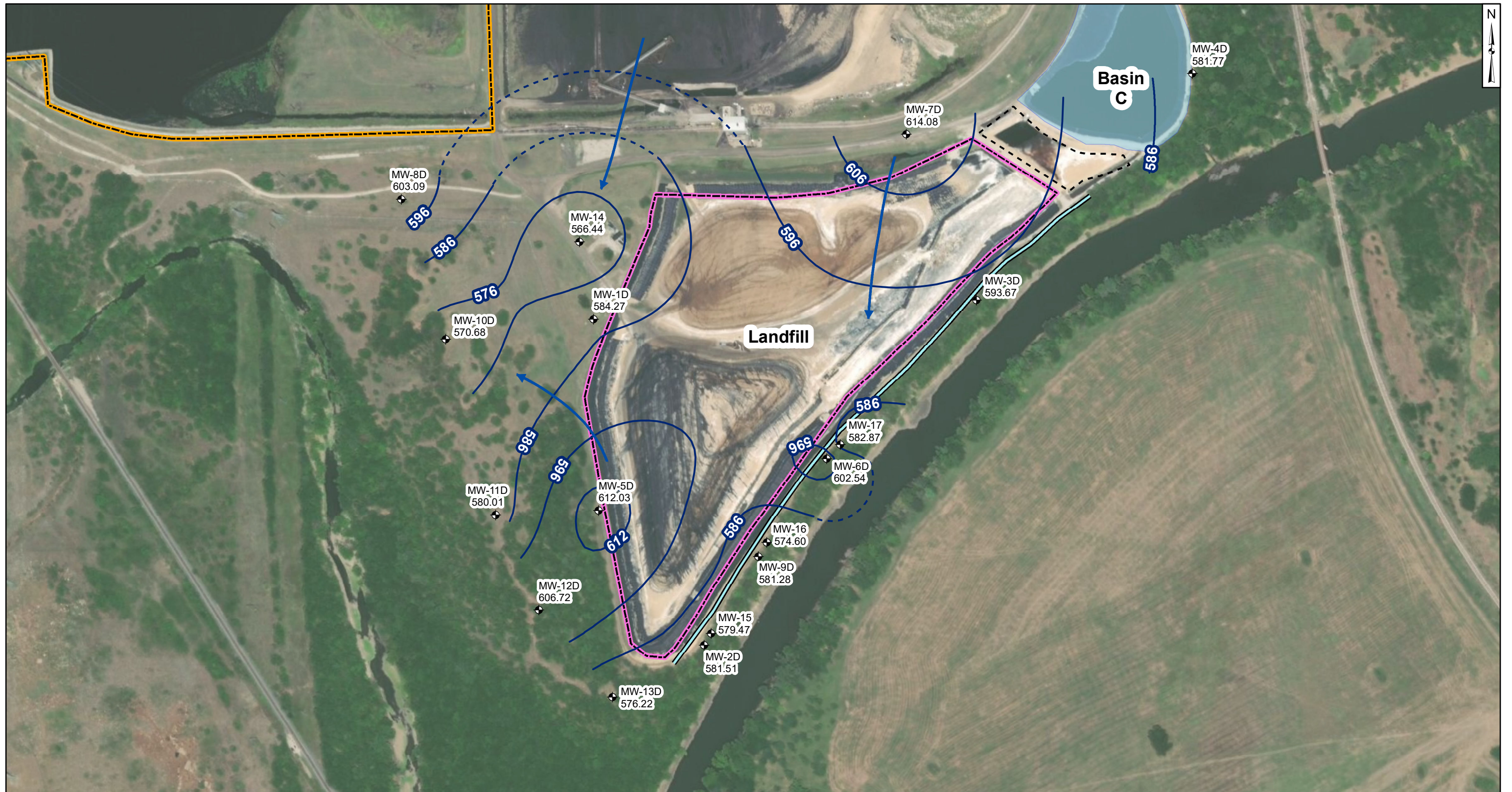
Key activities for 2020 include:

- Detection monitoring on a twice per year schedule;
- Submit Financial Assurance;
- Evaluation of the detection monitoring results from a statistical analysis viewpoint, looking for SSIs;
- Submit a drilling plan outlining the fieldwork that will assist in identifying appropriate background well(s) location(s), representative of the Landfill aquifer.
- Preparation of the next annual groundwater report.

## APPENDIX I

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

**Notes**

- Monitoring well coordinates and water level data (collected February 27, 2019) provided by AEP.
- River water height 533.01 ft. above msl at time of data collection (USGS 07178452)
- Groundwater elevation units are feet above mean sea level (ft. msl).



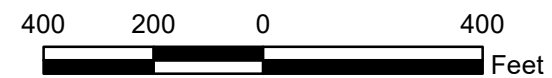
<b>Potentiometric Contours - Uppermost Aquifer February 2019</b>	
AEP Northeastern Power Plant - Landfill Oologah, Oklahoma	
<b>Geosyntec</b> consultants	
Columbus, Ohio	2020/01/22
<b>Figure 1</b>	



- Legend**
- ◆ Groundwater Monitoring Well
  - ➔ Approximate Groundwater Flow Direction
  - Groundwater Elevation Contour
  - - - Groundwater Elevation Contour (Inferred)
  - ▭ Bottom Ash Pond
  - ▭ Impoundment
  - ▭ Landfill
  - ▭ Slurry Wall

**Notes**

- Monitoring well coordinates and water level data (collected August 26, 2019) provided by AEP.
- River water height 534.01 ft. above msl at time of data collection (USGS 07178452)
- Groundwater elevation units are feet above mean sea level (ft. msl).
- Only wells screened in the Bandera Shale were used for contouring.



**Potentiometric Contours - Uppermost Aquifer  
August 2019**

AEP Northeastern Power Plant - Landfill  
Oologah, Oklahoma

**Geosyntec**  
consultants

Figure

**2**

Columbus, Ohio

2020/01/22

**Table 1: Residence Time Calculation Summary  
Northeastern Landfill**

CCR Management Unit	Monitoring Well	Well Diameter (inches)	2019-02		2019-08	
			Groundwater Velocity (ft/year)	Groundwater Residence Time (days)	Groundwater Velocity (ft/year)	Groundwater Residence Time (days)
Landfill	MW-3D <sup>[2]</sup>	2.0	0.6	101	0.7	82
	MW-4D <sup>[2]</sup>	2.0	0.7	81	0.8	79
	MW-5D <sup>[2]</sup>	2.0	2.1	29	1.8	34
	MW-6D <sup>[2]</sup>	2.0	6.5	9.3	6.7	9.1
	MW-7D <sup>[3]</sup>	2.0	0.9	65	1.1	56
	MW-8D <sup>[3]</sup>	2.0	1.4	45	2.2	27
	MW-9D <sup>[2]</sup>	2.0	0.9	66	0.8	78
	MW-12D <sup>[2]</sup>	2.0	1.8	34	1.9	32
	MW-15 <sup>[2]</sup>	2.0	1.3	46	1.7	37

Notes:

- [1] - Background Well
- [2] - Downgradient Well
- [3] - Observation Well

**Table 1 - Groundwater Data Summary: MW-3D  
Northeastern - Landfill  
Appendix A Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Total Dissolved Solids	Sulfate
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
1/25/2017	Background	0.919	111	16	<1 U	7.5	658	174
3/14/2017	Background	0.913	120	14	1.0	--	648	175
4/27/2017	Background	0.972	110	14	0.77 J	7.9	662	181
5/18/2017	Background	0.789	163	12	<0.083 U	--	598	192
6/16/2017	Background	0.873	137	12	0.8472 J	7.3	742	225
6/28/2017	Background	0.840	194	13	0.7591 J	7.3	766	232
7/12/2017	Background	0.864	129	13	<0.083 U	6.9	728	210
8/4/2017	Background	0.856	135	12	0.7381 J	6.7	710	227
8/17/2017	Background	0.841	138	23	<0.083 U	6.8	728	213
8/30/2017	Background	0.840	136	12	0.7144 J	6.9	696	216
9/13/2017	Background	0.877	152	11	<0.083 U	6.8	848	212
9/20/2017	Background	0.853	139	11	<0.083 U	6.9	724	214
10/11/2017	Detection	0.878	134	13	<0.083 U	6.9	722	218
5/2/2018	Detection	1.08	127	13	0.757 J	7.3	736	196
5/30/2018	Detection	0.952	129	13	0.896 J	7.5	724	214
10/22/2018	Detection	1.02	142	14.89	1.09	7.2	702	210.57
11/28/2018	Detection	0.964	--	--	0.648 J	8.0	--	--
2/27/2019	Detection	0.973	127	13.2	0.710	7.8	700	223
5/7/2019	Detection	1.56	--	--	--	--	--	--
8/26/2019	Detection	0.979	130	12	0.608 J	8.5	686	181
12/3/2019	Detection	--	--	--	--	7.4	--	--

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Due to limited groundwater volume, pH values for several sampling events were collected the day prior to collection of analytical samples for other parameters.

**Table 1 - Groundwater Data Summary: MW-3D  
Northeastern - Landfill  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
1/25/2017	Background	<5 U	<5 U	111	<1 U	<1 U	2.0	<5 U	2.153	<1 U	<5 U	0.0170	<0.025 U	<5 U	<5 U	<2 U
3/14/2017	Background	<5 U	<5 U	100	<1 U	<1 U	<1 U	<5 U	1.456	1.0	<5 U	0.0160	<0.025 U	<5 U	<5 U	<2 U
4/27/2017	Background	<0.93 U	3.3 J	89.64	<0.02 U	0.26 J	0.35 J	1.3 J	0.419	0.77 J	<0.68 U	0.01508	<0.005 U	1.97 J	<0.99 U	<0.86 U
5/18/2017	Background	<0.93 U	10.64	1040	0.92 J	0.61 J	18.06	5.32	2.443	<0.083 U	3.24 J	0.01943	0.01 J	4.15 J	<0.99 U	<0.86 U
6/16/2017	Background	1.44 J	1.48 J	150	0.08 J	0.22 J	1.23	1.09 J	1.706	0.8472 J	0.83 J	0.01451	<0.005 U	3.04 J	<0.99 U	<0.86 U
6/28/2017	Background	<0.93 U	<1.05 U	97.64	0.09 J	0.45 J	4.8	2.69 J	2.431	0.7591 J	2.99 J	0.01836	0.007 J	79.28	<0.99 U	<0.86 U
7/12/2017	Background	<0.93 U	<1.05 U	118	0.05 J	0.08 J	0.41 J	0.82 J	14.283	<0.083 U	<0.68 U	0.01435	<0.005 U	3.22 J	<0.99 U	<0.86 U
8/4/2017	Background	<0.93 U	<1.05 U	124	0.07 J	0.21 J	0.82 J	0.84 J	2.242	0.7381 J	0.8 J	0.01344	0.013 J	3.08 J	<0.99 U	<0.86 U
8/17/2017	Background	<0.93 U	<1.05 U	274	0.17 J	0.24 J	3.11	1.83 J	2.328	<0.083 U	<0.68 U	0.01495	<0.005 U	2.91 J	1 J	<0.86 U
8/30/2017	Background	<0.93 U	2.6 J	244	0.16 J	0.33 J	2.36	1.54 J	2.215	0.7144 J	<0.68 U	0.01465	<0.005 U	2.68 J	<0.99 U	<0.86 U
9/13/2017	Background	<0.93 U	4.52 J	430	0.35 J	0.49 J	6.32	2.97 J	1.566	<0.083 U	1.55 J	0.01639	<0.005 U	2.74 J	<0.99 U	1.02 J
9/20/2017	Background	1.63 J	1.14 J	267	0.17 J	0.21 J	2.74	1.41 J	2.162	<0.083 U	<0.68 U	0.01508	<0.005 U	3.33 J	<0.99 U	<0.86 U

Notes:  
µg/L: micrograms per liter  
SU: standard unit  
<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.  
J: Estimated value. Parameter was detected at concentration below the reporting limit  
--: Not analyzed  
pCi/L: picocuries per liter  
Due to limited groundwater volume, radium samples for several sampling events were collected the day prior to collection of analytical samples for other parameters.

**Table 1 - Groundwater Data Summary: MW-4D  
Northeastern - Landfill  
Appendix A Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Total Dissolved Solids	Sulfate
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/2/2018	Background	1.21	192	22	<0.083 U	7.1	984	328
5/30/2018	Background	1.27	164	20	0.4188 J	7.0	910	279
6/27/2018	Background	1.16	177	20	<0.083 U	7.9	882	258
7/31/2018	Background	1.04	196	31	<0.083 U	7.8	856	294
8/30/2018	Background	1.26	183	--	--	8.1	886	--
9/19/2018	Background	1.13	174	31	<0.083 U	7.8	884	260
10/15/2018	Background	0.656	195	37.9	<0.083 U	7.6	846	289.3
10/22/2018	Background	--	--	39.8	<0.083 U	7.9	--	306
11/28/2018	Background	1.24	193	27.0	0.3357 J	7.9	972	295
1/15/2019	Detection	1.16	183	24.6	0.37 J	7.5	--	417.6
2/27/2019	Detection	1.42	187	31.2	0.30	7.7	696	463
5/7/2019	Detection	--	--	--	--	--	--	419
8/26/2019	Detection	0.987	184	23	0.171 J	8.1	830	274

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

**Table 1 - Groundwater Data Summary: MW-4D  
Northeastern - Landfill  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/2/2018	Background	4.05 J	2.3 J	171	<0.02 U	0.14 J	1.37	2.36 J	1.625	<0.083 U	1.47 J	0.00533	<0.005 U	6.74	<0.99 U	1.19 J
5/30/2018	Background	<0.93 U	<1.05 U	173	<0.02 U	<0.07 U	<0.23 U	1.28 J	1.991	0.4188 J	<0.68 U	0.00330	<0.005 U	4.91 J	<0.99 U	2.94
6/27/2018	Background	<0.93 U	<1.05 U	167	<0.02 U	<0.07 U	1.93	1.82 J	1.244	<0.083 U	<0.68 U	0.00491	<0.005 U	4.64 J	<0.99 U	2.94
7/31/2018	Background	0.05	1.25	173	0.01 J	0.04	<7 U	0.521	1.506	<0.083 U	0.130	0.00315	<0.005 U	4.59	0.2	0.02 J
8/30/2018	Background	0.10	1.60	163	0.049	0.11	0.551	0.807	0.912	--	0.804	0.00296	0.007 J	4.48	0.3	0.02 J
9/19/2018	Background	0.04 J	1.20	177	0.02 J	0.03 J	0.273	0.551	3.91	<0.083 U	0.595	0.00289	<0.005 U	3.71	0.2	<0.1 U
10/15/2018	Background	0.15	2.28	166	0.06 J	0.16	0.872	0.873	3.056	<0.083 U	1.41	0.00336	<0.005 U	4.58	0.3	<0.1 U
10/22/2018	Background	--	--	--	--	--	--	--	--	<0.083 U	--	--	--	--	--	--
11/28/2018	Background	<0.1 U	1.31	171	<0.1 U	0.06 J	0.3 J	0.677	1.629	0.3357 J	0.3 J	0.00378	<0.005 U	8 J	0.2 J	<0.5 U

Notes:  
µg/L: micrograms per liter  
SU: standard unit  
<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.  
J: Estimated value. Parameter was detected at concentration below the reporting limit  
--: Not analyzed  
pCi/L: picocuries per liter

**Table 1 - Groundwater Data Summary: MW-5D  
Northeastern - Landfill  
Appendix A Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Total Dissolved Solids	Sulfate
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
5/2/2018	Background	0.476	132	25	0.703 J	7.3	636	126
5/30/2018	Background	0.468	136	24	0.711 J	7.2	628	113
6/27/2018	Background	0.478	134	26	0.7487 J	8.2	658	122
7/31/2018	Background	0.491	142	30	0.8769 J	8.3	628	662
8/30/2018	Background	0.520	158	--	--	8.1	648	--
9/19/2018	Background	0.444	156	30	0.7519 J	7.7	662	134
10/15/2018	Background	0.439	141	30.2	0.845 J	7.8	636	138.7
10/22/2018	Background	--	--	30.3	0.806 J	8.0	--	138
11/28/2018	Background	0.612	143	24.0	0.371 J	8.1	614	143
1/15/2019	Detection	0.540	157	24.0	0.316 J	7.8	--	127.6
2/27/2019	Detection	0.531	130	26.7	0.50	8.5	616	153
5/7/2019	Detection	--	--	--	--	--	--	158
8/26/2019	Detection	0.568	146	24	0.412 J	9.8	670	134
12/3/2019	Detection	--	--	--	--	7.2	--	--

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed



**Table 1 - Groundwater Data Summary: MW-5D  
Northeastern - Landfill  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
5/2/2018	Background	2.91 J	1.24 J	127	<0.02 U	0.36 J	0.59 J	1.14 J	2.449	0.703 J	1.01 J	0.01243	<0.005 U	1.33 J	1.35 J	1.25 J
5/30/2018	Background	<0.93 U	<1.05 U	139	<0.02 U	<0.07 U	1.53	1.31 J	3.06	0.711 J	1.09 J	0.01199	<0.005 U	<0.29 U	<0.99 U	<0.86 U
6/27/2018	Background	2.5 J	<1.05 U	126	<0.02 U	<0.07 U	0.8 J	0.63 J	2.512	0.7487 J	<0.68 U	0.01208	<0.005 U	0.96 J	<0.99 U	2
7/31/2018	Background	0.16	1.27	143	0.103	0.21	0.355	0.482	2.876	0.8769 J	1.43	0.01100	<0.005 U	1.21	0.4	0.02 J
8/30/2018	Background	0.10	0.98	111	0.076	0.1	0.518	0.300	2.906	-	0.706	0.01120	0.006 J	1.24	0.3	0.04 J
9/19/2018	Background	0.13	1.18	118	0.08 J	0.09	0.745	0.336	5.163	0.7519 J	0.720	0.01070	<0.005 U	2 J	0.4	<0.1 U
10/15/2018	Background	0.07 J	0.99	103	0.07 J	0.08	0.423	0.289	5.319	0.845 J	0.379	0.00977	<0.005 U	1 J	0.3	<0.1 U
11/28/2018	Background	<0.1 U	1.15	113	<0.1 U	0.06 J	0.5 J	0.324	2.393	0.371 J	0.4 J	0.01210	<0.005 U	0.2 J	0.3 J	<0.5 U

Notes:  
µg/L: micrograms per liter  
SU: standard unit  
<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.  
J: Estimated value. Parameter was detected at concentration below the reporting limit  
- -: Not analyzed  
pCi/L: picocuries per liter

**Table 1 - Groundwater Data Summary: MW-6D  
Northeastern - Landfill  
Appendix A Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Total Dissolved Solids	Sulfate
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/16/2017	Background	3.51	201	28	0.8054 J	7.5	1054	508
6/28/2017	Background	0.877	133	29	0.7596 J	7.9	1024	524
7/13/2017	Background	3.49	218	30	<0.083 U	7.3	1044	504
8/4/2017	Background	3.64	222	31	0.7656 J	6.4	1022	532
8/17/2017	Background	3.55	211	30	0.729 J	6.9	1016	509
8/30/2017	Background	3.41	210	30	0.7158 J	7.2	986	522
9/13/2017	Background	2.96	237	32	0.5406 J	7.1	1140	521
9/20/2017	Background	3.81	196	32	<0.083 U	7.1	1008	505
10/11/2017	Detection	3.74	165	29	0.9597 J	6.9	1032	545
1/22/2018	Detection	4.24	--	--	0.76 J	6.9	--	494
5/2/2018	Detection	3.52	173	31	0.806 J	7.3	1062	406
5/30/2018	Detection	3.35	269	32	0.9218 J	7.4	1090	401
10/22/2018	Detection	4.34	237	31.68	1.28	7.3	1152	471.81
11/28/2018	Detection	--	--	--	0.844 J	7.7	--	--
2/27/2019	Detection	3.63	360	26.9	0.890	7.6	1144	496
5/7/2019	Detection	--	185	--	--	--	1038	--
8/26/2019	Detection	2.88	181	13	0.634 J	8.6	1044	401
12/3/2019	Detection	--	--	--	--	7.5	--	--

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Due to limited groundwater volume, pH values for several sampling events were collected the day prior to collection of analytical samples for other parameters.

**Table 1 - Groundwater Data Summary: MW-6D  
Northeastern - Landfill  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/16/2017	Background	<0.93 U	1.99 J	113	0.18 J	0.8 J	5.99	3.73 J	1.822	0.8054 J	3.48 J	0.02203	0.012 J	85.01	<0.99 U	<0.86 U
6/28/2017	Background	1.28 J	<1.05 U	170	0.06 J	0.37 J	0.86 J	1.09 J	1.917	0.7596 J	0.76 J	0.01356	<0.005 U	2.79 J	<0.99 U	<0.86 U
7/13/2017	Background	<0.93 U	<1.05 U	107	0.22 J	0.56 J	6.82	3.82 J	1.784	<0.083 U	5	0.02244	0.007 J	61.81	<0.99 U	<0.86 U
8/4/2017	Background	<0.93 U	<1.05 U	128	0.22 J	0.93 J	6.62	3.39 J	1.115	0.7656 J	4.96 J	0.01921	0.016 J	82.11	<0.99 U	<0.86 U
8/17/2017	Background	1.26 J	1.18 J	99.54	0.19 J	0.44 J	6.77	3.07 J	1.155	0.729 J	3.25 J	0.01925	0.011 J	81.32	<0.99 U	<0.86 U
8/30/2017	Background	<0.93 U	2.06 J	103	0.22 J	0.36 J	6.68	3.03 J	1.057	0.7158 J	2.5 J	0.01829	<0.005 U	85.75	<0.99 U	<0.86 U
9/13/2017	Background	<0.93 U	1.19 J	109	0.31 J	0.49 J	8.15	3.71 J	1.377	0.5406 J	3.28 J	0.02105	<0.005 U	58.00	<0.99 U	<0.86 U
9/20/2017	Background	1.18 J	1.93 J	75.04	0.14 J	0.22 J	3.86	2.27 J	1.43	<0.083 U	2.33 J	0.01701	<0.005 U	81.00	<0.99 U	<0.86 U

Notes:  
µg/L: micrograms per liter  
SU: standard unit  
<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.  
J: Estimated value. Parameter was detected at concentration below the reporting limit  
- -: Not analyzed  
pCi/L: picocuries per liter  
Due to limited groundwater volume, radium samples for several sampling events were collected the day prior to collection of analytical samples for other parameters.

**Table 1 - Groundwater Data Summary: MW-9D  
Northeastern - Landfill  
Appendix A Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Total Dissolved Solids	Sulfate
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
6/16/2017	Background	7.09	229	100	0.9857 J	7.1	1458	781
6/28/2017	Background	7.01	191	232	0.8986 J	7.7	1114	876
7/12/2017	Background	7.63	244	98	2.191	7.4	2146	1048
8/4/2017	Background	7.59	337	60	0.6947 J	7.0	2256	1217
8/17/2017	Background	7.46	328	216	0.681 J	7.1	2486	1193
8/30/2017	Background	6.93	354	64	<0.083 U	7.3	2392	1192
9/13/2017	Background	6.78	366	293	0.37 J	7.2	2826	1244
10/4/2017	Background	6.68	304	180	<0.083 U	7.3	2296	1079
10/11/2017	Detection	7.07	288	314	1.5191	7.1	2188	1075
1/22/2018	Detection	7.43	--	--	--	7.1	--	--
10/22/2018	Detection	7.19	199	106	0.6 J	7.1	1258	519.42
2/27/2019	Detection	6.49	155	28.9	0.890	7.6	1174	555
8/26/2019	Detection	6.95	136	24	0.758 J	8.8	1084	526
12/3/2019	Detection	--	--	--	--	7.6	--	--

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Due to limited groundwater volume, pH values for several sampling events were collected the day prior to collection of analytical samples

**Table 1 - Groundwater Data Summary: MW-9D  
Northeastern - Landfill  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
6/16/2017	Background	<0.93 U	<1.05 U	188	0.32 J	0.81 J	12.34	6.18	0.931	0.9857 J	7.02	0.02386	0.009 J	173	5.0	<0.86 U
6/28/2017	Background	<0.93 U	<1.05 U	58.15	<0.02 U	0.26 J	0.89 J	7.14	--	0.8986 J	1.24 J	0.01647	<0.005 U	166	<0.99 U	<0.86 U
7/12/2017	Background	<0.93 U	<1.05 U	69.89	0.05 J	<0.07 U	4.09	5.69	--	2.191	2.36 J	0.02221	<0.005 U	151	1.32 J	<0.86 U
8/4/2017	Background	<0.93 U	<1.05 U	132	0.17 J	0.54 J	7.15	7.34	--	0.6947 J	4.26 J	0.02155	0.017 J	117	3.57 J	<0.86 U
8/17/2017	Background	<0.93 U	<1.05 U	196	0.22 J	0.25 J	9.52	8.17	--	0.681 J	5.33	0.02401	0.011 J	98.19	3.53 J	<0.86 U
8/30/2017	Background	<0.93 U	<1.05 U	323	0.37 J	0.91 J	20.06	15.08	--	<0.083 U	9.27	0.02964	0.016 J	93.84	2.94 J	<0.86 U
9/13/2017	Background	<0.93 U	<1.05 U	399	0.4 J	0.68 J	13.34	12.88	--	0.37 J	8.28	0.03257	0.016 J	78.39	2.8 J	<0.86 U
10/4/2017	Background	<0.93 U	<1.05 U	410	0.43 J	2.40	14.79	8.38	--	<0.083 U	9.69	0.03222	0.015 J	73.77	3.83 J	<0.86 U

Notes:  
µg/L: micrograms per liter  
SU: standard unit  
<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.  
J: Estimated value. Parameter was detected at concentration below the reporting limit  
--: Not analyzed  
pCi/L: picocuries per liter

**Table 1 - Groundwater Data Summary: MW-12D  
Northeastern - Landfill  
Appendix A Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Total Dissolved Solids	Sulfate
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
3/15/2017	Background	--	76.9	16	2.0	--	1142	613
5/2/2018	Background	8.63	184	17	2.199	7.4	1044	541
5/30/2018	Background	8.35	89.9	91	2.379	7.7	1088	542
6/27/2018	Background	8.45	74.9	17	1.988	8.2	1070	586
7/31/2018	Background	8.72	108	22	2.6173	8.7	1034	662
8/30/2018	Background	9.71	141	--	--	9.2	1050	--
9/19/2018	Background	9.02	110	21	2.8416	8.1	1052	582
10/15/2018	Background	8.68	70	21	2.99	9.4	1060	561.2
10/22/2018	Background	--	--	19.44	2.80	9.0	--	504.3
11/28/2018	Background	9.69	103	16.0	2.2238	8.9	1068	570
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	1014	564
8/26/2019	Detection	8.90	96.3	14	1.6	8.7	1018	540

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

**Table 1 - Groundwater Data Summary: MW-12D  
Northeastern - Landfill  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
3/15/2017	Background	<5 U	<5 U	31.0	<1 U	<1 U	<1 U	<5 U	--	2.0	<5 U	--	<0.025 U	--	<5 U	<2 U
5/2/2018	Background	<0.93 U	1.56 J	121	0.13 J	0.8 J	7.95	3.52 J	1.625	2.199	7.03	0.00841	0.013 J	693	4.5 J	<0.86 U
5/30/2018	Background	<0.93 U	1.24 J	77.75	<0.02 U	0.25 J	2.74	1.49 J	1.213	2.379	3.04 J	0.00608	<0.005 U	667	3.88 J	2.20
6/27/2018	Background	<0.93 U	<1.05 U	36.18	<0.02 U	<0.07 U	<0.23 U	0.39 J	1.331	1.988	<0.68 U	0.00541	<0.005 U	666	1.55 J	1.99 J
7/31/2018	Background	0.11	3.00	42.0	0.053	0.07	0.414	0.674	0.721	2.6173	2.32	0.00600	<0.005 U	818	1.7	0.106
8/30/2018	Background	0.20	3.39	65.8	0.097	0.31	1.82	2.17	3.137	--	5.43	0.00396	<0.005 U	872	3.1	0.241
9/19/2018	Background	0.36	4.67	82.6	0.1 J	0.33	2.03	1.57	4.417	2.8416	5.18	0.0041	0.012 J	828	2.9	0.2 J
10/15/2018	Background	0.43	6.46	50.2	0.06 J	0.20	1.6	1.31	3.541	2.99	3.51	0.00308	0.007 J	774	4.6	0.3 J
11/28/2018	Background	0.3 J	3.99	71.7	0.1 J	0.33	1.7	0.989	1.486	2.2238	4.12	0.00483	0.007 J	744	1.9	<0.5 U

Notes:  
µg/L: micrograms per liter  
SU: standard unit  
<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.  
J: Estimated value. Parameter was detected at concentration below the reporting limit  
--: Not analyzed  
pCi/L: picocuries per liter

**Table 1 - Groundwater Data Summary: MW-15  
Northeastern - Landfill  
Appendix A Constituents**

Collection Date	Monitoring Program	Boron	Calcium	Chloride	Fluoride	pH	Total Dissolved Solids	Sulfate
		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L
1/25/2017	Background	9.45	87.0	19	2.0	8.0	1112	530
3/13/2017	Background	8.23	104	28	2.0	--	1110	551
4/27/2017	Background	9.44	73.1	78	1.83	7.6	1128	558
5/18/2017	Background	10.2	52.2	111	2.0	--	1092	596
6/16/2017	Background	9.74	126	24	1.96	7.9	1060	559
6/28/2017	Background	9.75	79.2	22	1.8739	8.5	1072	616
7/13/2017	Background	9.87	110	19	1.894	8.2	1076	632
8/4/2017	Background	9.66	86.3	19	1.759	7.6	1032	612
8/17/2017	Background	9.53	93.1	18	1.691	7.8	1110	572
8/30/2017	Background	9.59	64.9	17	2.0289	6.7	1038	590
9/13/2017	Background	9.13	68.0	17	1.671	8.6	1080	584
9/20/2017	Background	9.65	67.6	15	0.642 J	7.5	1036	543
10/11/2017	Detection	9.62	80.1	46	1.9468	7.6	1124	593
1/22/2018	Detection	9.16	--	--	--	7.2	--	--
5/30/2018	Detection	8.76	105	33	2.331	7.7	1128	549
10/15/2018	Detection	--	--	--	2.27	--	--	--
10/22/2018	Detection	8.90	250	46.81	2.17	7.8	1082	549.46
11/28/2018	Detection	--	119	--	--	8.3	--	--
2/27/2019	Detection	8.34	96.9	24.3	1.45	8.6	1046	574
8/26/2019	Detection	8.28	119	20	1.252	10.5	1072	587
12/3/2019	Detection	--	--	--	--	7.7	--	--

Notes:

mg/L: milligrams per liter

SU: standard unit

<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.

J: Estimated value. Parameter was detected at concentration below the reporting limit

--: Not analyzed

Due to limited groundwater volume, pH values for several sampling events were collected the day prior to collection of analytical samples for other parameters.



**Table 1 - Groundwater Data Summary: MW-15  
Northeastern - Landfill  
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	µg/L	pCi/L	mg/L	µg/L	mg/L	µg/L	µg/L	µg/L
1/25/2017	Background	<5 U	<5 U	107	<1 U	<1 U	3.00	<5 U	0.505	2.0	<5 U	0.0120	<0.025 U	643	<5 U	<2 U
3/13/2017	Background	<5 U	<5 U	100	<1 U	<1 U	3.00	<5 U	1.241	2.0	<5 U	0.0100	<0.025 U	550	<5 U	<2 U
4/27/2017	Background	1.31 J	2.85 J	55.73	<0.02 U	<0.07 U	0.23 J	0.64 J	0.203	1.83	<0.68 U	0.00786	<0.005 U	614	1.83 J	1.05 J
5/18/2017	Background	1.38 J	13.61	52.06	<0.02 U	0.26 J	0.96 J	0.62 J	1.097	2.0	1.7 J	0.00834	0.022 J	605	22.28	<0.86 U
6/16/2017	Background	<0.93 U	7.56	212	0.25 J	0.64 J	8.57	3.96 J	1.215	1.96	5.25	0.01148	0.02 J	662	12.46	<0.86 U
6/28/2017	Background	<0.93 U	4.4 J	98.67	0.02 J	<0.07 U	1.79	1.29 J	1.652	1.8739	2.42 J	0.00722	0.022 J	644	5.76	<0.86 U
7/13/2017	Background	1.63 J	3.77 J	150	0.12 J	0.09 J	4.03	2.64 J	0.287	1.894	2.87 J	0.00910	0.009 J	668	9.0	<0.86 U
8/4/2017	Background	1.56 J	3.73 J	94.19	0.08 J	0.09 J	1.51	1.4 J	0.914	1.759	1.36 J	0.00752	0.021 J	647	6.0	<0.86 U
8/17/2017	Background	0.99 J	4.44 J	133	0.09 J	<0.07 U	3.30	1.69 J	0.649	1.691	1.44 J	0.00823	0.015 J	642	5.95	<0.86 U
8/30/2017	Background	<0.93 U	6.32	64.87	0.04 J	<0.07 U	0.86 J	0.78 J	0.393	2.0289	<0.68 U	0.00629	0.01 J	656	9.24	<0.86 U
9/13/2017	Background	<0.93 U	4.18 J	54.34	0.03 J	<0.07 U	<0.23 U	0.66 J	1.070	1.671	<0.68 U	0.00635	0.008 J	638	1.45 J	<0.86 U
9/20/2017	Background	<0.93 U	3.87 J	49.23	<0.02 U	<0.07 U	0.23 J	0.77 J	0.887	0.642 J	<0.68 U	0.00621	<0.005 U	652	3.77 J	<0.86 U

Notes:  
µg/L: micrograms per liter  
SU: standard unit  
<: Non-detect value. Parameters which were not detected are shown as less than the reporting limit for the January and March 2017 events and less than the method detection limit (MDL) for all subsequent events followed by a 'U' flag.  
J: Estimated value. Parameter was detected at concentration below the reporting limit  
--: Not analyzed  
pCi/L: picocuries per liter  
Due to limited groundwater volume, radium samples for several sampling events were collected the day prior to collection of analytical samples for other parameters.

## **APPENDIX II**

Where applicable, show in this appendix the results from statistical analyses, and a description of the statistical analysis method chosen. These statistical analyses are to be conducted separately for each constituent in each monitoring well.

## Memorandum

Date: January 11, 2019  
To: David Miller (AEP)  
Copies to: Jill Parker-Witt (AEP)  
From: Allison Kreinberg and Bruce Sass, Ph.D. (Geosyntec)  
Subject: Evaluation of Detection Monitoring Data at  
Northeastern Plant's Landfill (LF)

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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) detection monitoring events were completed on May 30, 2018 and October 15, 2018 at the Landfill (LF), an existing CCR unit at the Northeastern Power Plant located in Oologah, Oklahoma.

Eight background monitoring events were conducted at the Northeastern LF prior to these detection monitoring events, and upper prediction limits (UPLs) were calculated for each Appendix III parameter to represent background values. Lower prediction limits (LPLs) were also calculated for pH. Details on the calculation of these background values are described in Geosyntec's *Statistical Analysis Summary* report, dated January 15, 2018. An alternative source demonstration (ASD) was certified on April 13, 2018 which resulted in a revision to the calculated prediction limits for boron and pH.

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 and the noted exceedance is described below.

Evaluation of Detection Monitoring Data – Northeastern LF

January 11, 2019

Page 2

- Fluoride concentrations exceeded the intrawell UPL of 2.24 mg/L in both the initial (2.33 mg/L) and second (2.27 mg/L) samples collected at MW-15. Therefore, an SSI over background is concluded for fluoride at MW-15.

In response to the exceedance noted above the Northeastern LF CCR unit will either transition to assessment monitoring or an alternate source demonstration for fluoride will be conducted.

No other exceedances of UPLs were observed during these detection monitoring events.

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  
Northeastern Plant - Landfill**

*Geosyntec Consultants, Inc.*

Parameter	Units	Description	MW-3D	MW-6D	MW-9D	MW-15	
			5/30/2018	5/30/2018	--	5/30/2018	10/15/2018
Boron	mg/L	Intrawell Background Value (UPL)	0.975	4.35	8.11	10.6	
	mg/L	Detection Monitoring Result	0.952	3.35	--	8.76	--
Calcium	mg/L	Intrawell Background Value (UPL)	190	285	463	132	
	mg/L	Detection Monitoring Result	129	269	--	105	--
Chloride	mg/L	Intrawell Background Value (UPL)	16.2	33.9	383	78	
	mg/L	Detection Monitoring Result	13	32	--	33	--
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00	0.941	2.28	2.24	
	mg/L	Detection Monitoring Result	0.896	0.922	--	2.33	2.27
pH	SU	Intrawell Background Value (UPL)	8.03	8.32	7.77	9.14	
	SU	Intrawell Background Value (LPL)	6.17	5.98	6.74	6.56	
	SU	Detection Monitoring Result	7.46	7.39	--	7.713	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	853	1159	3591	1152	
	mg/L	Detection Monitoring Result	724	1090	--	1128	--
Sulfate	mg/L	Intrawell Background Value (UPL)	251	543	1524	649	
	mg/L	Detection Monitoring Result	214	401	--	549	--

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

-: Not Sampled

**Bold values exceed the background value.**

Background values are shaded gray.

**ATTACHMENT A**  
**Certification by Qualified Professional Engineer**

**CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER**

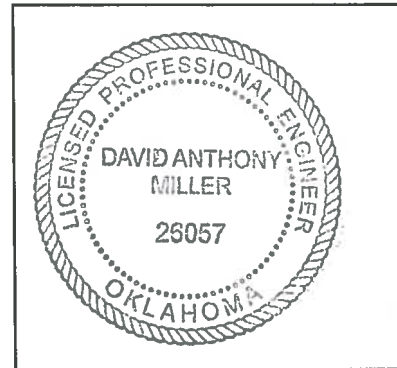
I certify that the selected statistical method, described above and in the January 15, 2018 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Northeastern LF CCR management area and that the requirements of 40 CFR 257.93(f) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



26057

License Number

OKLAHOMA

Licensing State

01.17.19

Date

## Memorandum

Date: February 16, 2019

To: David Miller (AEP)

Copies to: Jill Parker-Witt (AEP)

From: Allison Kreinberg and Bruce Sass, Ph.D. (Geosyntec)

Subject: Evaluation of Detection Monitoring Data at  
Northeastern Plant's Landfill (LF)

---

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) detection monitoring events were completed on October 22, 2018 and November 29, 2018 at the Landfill (LF), an existing CCR unit at the Northeastern Power Plant located in Oologah, Oklahoma.

Eight to twelve background monitoring events were conducted at the Northeastern LF prior to these detection monitoring events, and 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 these background values are described in Geosyntec's *Statistical Analysis Summary* report, dated January 15, 2018. An alternative source demonstration (ASD) was certified on April 13, 2018 which resulted in a revision to the calculated prediction limits for boron and pH.

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.



Evaluation of Detection Monitoring Data – Northeastern LF  
February 15, 2019  
Page 2

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  
Northeastern Plant - Landfill**

*Geosyntec Consultants, Inc.*

Parameter	Units	Description	MW-3D		MW-6D		MW-9D	MW-15	
			10/22/2018	11/29/2018	10/22/2018	11/29/2018	10/22/2018	10/22/2018	11/28/2018
Boron	mg/L	Intrawell Background Value (UPL)	0.975		4.35		8.11	10.6	
		Detection Monitoring Result	<b>1.02</b>	0.964	4.34	-	7.19	8.90	-
Calcium	mg/L	Intrawell Background Value (UPL)	190		285		463	132	
		Detection Monitoring Result	142	-	237	-	199	<b>141</b>	119
Chloride	mg/L	Intrawell Background Value (UPL)	16.2		33.9		383	78	
		Detection Monitoring Result	14.89	-	31.7	-	106	46.8	-
Fluoride	mg/L	Intrawell Background Value (UPL)	1		0.941		2.28	2.24	
		Detection Monitoring Result	<b>1.09</b>	0.648	<b>1.28</b>	0.844	0.600	2.17	-
pH	SU	Intrawell Background Value (UPL)	8.03		8.32		7.77	9.14	
		Intrawell Background Value (LPL)	6.17		5.98		6.74	6.56	
		Detection Monitoring Result	7.20	-	7.25	-	7.13	7.79	-
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	853		1159		3591	1152	
		Detection Monitoring Result	702	-	1152	-	1258	1082	-
Sulfate	mg/L	Intrawell Background Value (UPL)	251		543		1524	649	
		Detection Monitoring Result	211	-	472	-	519	549	-

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

**Bold values exceed the background value.**

Background values are shaded gray.

Based on a 1-of-2 resampling, a statistically significant increase (SSI) is only identified when both samples in the detection monitoring period are above the calculated

**ATTACHMENT A**  
**Statistical Analysis Output**

**CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER**

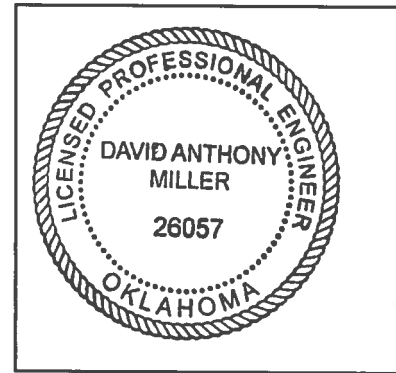
I certify that the selected statistical method, described above and in the January 15, 2018 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Northeastern LF CCR management area and that the requirements of OAC 252:517-9-4(g) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



26057

License Number

OKLAHOMA

Licensing State

03.15.19

Date

## Memorandum

Date: July 19, 2019

To: David Miller (AEP)

Copies to: Jill Parker-Witt (AEP)

From: Allison Kreinberg and Bruce Sass, Ph.D. (Geosyntec)

Subject: Evaluation of Detection Monitoring Data at  
Northeastern Plant's Landfill (LF)

---

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) detection monitoring events were completed on February 27, 2019 and May 7, 2019 at the Landfill (LF), an existing CCR unit at the Northeastern Power Plant located in Oologah, Oklahoma.

Eight to twelve background monitoring events were conducted at the Northeastern LF prior to these detection monitoring events, and 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 these background values are described in Geosyntec's *Statistical Analysis Summary* report, dated January 15, 2018. An alternative source demonstration (ASD) was certified on April 13, 2018 which resulted in a revision to the calculated prediction limits for boron and pH. A subsequent *Statistical Analysis Summary* report was prepared on July 19, 2019 to document the calculation of background values for MW-4D, MW-5D, and MW-12D.

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.

Evaluation of Detection Monitoring Data – Northeastern LF  
July 19, 2019  
Page 2

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  
Northeastern Plant - Landfill**

Parameter	Units	Description	MW-3D	MW-4D		MW-5D	MW-6D		MW-9D	MW-12D	MW-15
			2/27/2019	2/27/2019	5/7/2019	2/27/2019	2/27/2019	5/7/2019	2/27/2019	2/27/2019	2/27/2019
Boron	mg/L	Intrawell Background Value (UPL)	0.985	1.52		0.647	4.44		8.22	10.30	10.70
		Detection Monitoring Data	0.973	1.42	-	0.531	3.63	-	6.49	8.88	8.34
Calcium	mg/L	Intrawell Background Value (UPL)	195	221		172	295		483	198	136
		Detection Monitoring Data	127	187	-	130	<b>360</b>	185	155	64.7	96.9
Chloride	mg/L	Intrawell Background Value (UPL)	16.5	46.2		35.3	34.3		409	25.6	78.0
		Detection Monitoring Data	13.2	31.2	-	26.7	26.9	-	28.9	16.8	24.3
Fluoride	mg/L	Intrawell Background Value (UPL)	1.00	1.00		1.24	0.97		2.44	3.40	2.21
		Detection Monitoring Data	0.71	0.30	-	0.50	0.89	-	0.89	2.11	1.45
pH	SU	Intrawell Background Value (UPL)	8.1	8.6		8.8	8.5		7.8	10.2	9.3
		Intrawell Background Value (LPL)	6.1	6.7		6.9	5.8		6.7	6.7	6.4
		Detection Monitoring Data	7.8	7.7	-	8.5	7.6	-	7.6	8.5	8.6
Sulfate	mg/L	Intrawell Background Value (UPL)	256	428		160	546		1576	693	656
		Detection Monitoring Data	223	<b>463</b>	419	153	496	-	555	564	574
TDS	mg/L	Intrawell Background Value (UPL)	867	1037		686	1173		3763	1158	1159
		Detection Monitoring Data	700	696	-	616	1144	-	1174	1014	1046

Notes

UPL: Upper prediction limit

LPL: Lower prediction limit

TDS: Total dissolved solids

**Bold values exceed the background value.**

Background values are shaded gray.

## ATTACHMENT A

Certification by Qualified Professional Engineer



**CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER**

I certify that the selected statistical method, described above and in the January 15, 2018 *Statistical Analysis Summary* 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  
License Number

OKLAHOMA  
Licensing State

07.19.19  
Date

**STATISTICAL ANALYSIS SUMMARY  
STATIONS 3 AND 4 LANDFILL  
Northeastern Power Station  
Oologah, Oklahoma**

*Submitted to*



1 Riverside Plaza  
Columbus, Ohio 43215-2372

*Submitted by*



engineers | scientists | innovators

941 Chatham Lane  
Suite 103  
Columbus, Ohio 43214

July 2019

CHA8474

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2.2.2 Establishment of Background Levels.....	2-2
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## LIST OF TABLES

Table 1	Groundwater Data Summary
Table 2	Background Level Summary

## LIST OF ATTACHMENTS

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

## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ANOVA	Analysis of Variance
CCR	Coal Combustion Residuals
CCV	Continuing Calibration Value
CFR	Code of Federal Regulations
EPA	Environmental Protection Agency
LFB	Laboratory Fortified Blanks
LPL	Lower Prediction Limit
LRB	Laboratory Reagent Blanks
NELAP	National Environmental Laboratory Accreditation Program
ODEQ	Oklahoma Department of Environmental Quality
PQL	Practical Quantitation Limit
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
SWFPR	Site-Wide False-Positive Rate
TDS	Total Dissolved Solids
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency

## SECTION 1

### EXECUTIVE SUMMARY

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, “CCR rule”), groundwater monitoring has been conducted at the Stations 3 and 4 Landfill, an existing CCR unit at the Northeastern Power Station located in Oologah, Oklahoma.

In January 2018, background concentrations were established for Appendix A and Appendix B parameters at the CCR unit. AEP had previously established a background dataset for MW-3D, -6D, -9D, and -15. At the request of ODEQ, the Landfill’s groundwater monitoring network was expanded to include all 15 deep wells surrounding the unit (MW-1D through MW-6D, MW-9D through MW-17). At this time, adequate groundwater data has been collected for MW-4D, MW-5D, and MW-12D. To establish background concentrations for the expanded network, eight monitoring events were conducted under the CCR rule at the new locations. Groundwater data underwent several validation tests, including those for completeness, sample tracking accuracy, transcription errors, and consistent use of measurement units. No data quality issues were identified which would impact the usability of the data.

The monitoring data were submitted to Groundwater Stats Consulting, LLC for statistical analysis. The background data were reviewed for outliers, which were removed (when appropriate) prior to calculating upper prediction limits (UPLs) for each Appendix A parameter to represent background values. Oversight on the use of statistical calculations was provided by Dr. Kirk Cameron of MacStat Consulting, Ltd.

This report provides a summary of the statistical approach used to establish background concentrations for the three additional downgradient wells. A summary of the statistical evaluation to establish background concentrations for the initial groundwater monitoring network was previously documented (Geosyntec, 2018a). Certification of these statistics by a certified professional engineer is provided in **Attachment A**.

## SECTION 2

### LANDFILL EVALUATION

#### 2.1 Data Validation & QA/QC

During the background monitoring program, eight sets of samples were collected for analysis from the three new compliance monitoring wells. A summary of data collected during background may be found in **Table 1**.

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

The analytical data were imported into a Microsoft Access database, where checks were completed to assess the accuracy of sample location 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.9.5.32 statistics software. The export was checked against the analytical data for transcription errors and completeness. No QA/QC issues were noted which would impact data usability.

#### 2.2 Statistical Analysis

The groundwater analytical data (background data) used to establish background groundwater quality for each constituent required in detection monitoring are summarized in **Table 1**. Statistical analyses for the landfill were conducted in accordance with the June 2018 *Statistical Analysis Plan* (Geosyntec, 2018b), except where noted below. Results for all completed statistical tests are provided in **Attachment B**.

Time series plots of Appendix A and B parameters are included in **Attachment B**. Mann-Kendall analyses ( $\alpha = 0.01$ ) were conducted to evaluate trends in the background data. No significant increasing or decreasing trends were observed for Appendix A parameters at the three monitoring wells added to the groundwater monitoring network.

##### 2.2.1 Background Outlier Evaluation

Potential outliers were identified using Tukey's outlier test; i.e., 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:

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

Data that were evaluated as potential outliers are summarized in **Attachment B**. Tukey's outlier test indicated one potential outlier for Appendix A parameters in the new wells. Next, the data were reviewed to identify possible sources of errors or discrepancies, including data recording errors, unusual sampling conditions, laboratory quality, or inconsistent sample turbidity. The reported sulfate value of 662 milligrams per liter (mg/L) for the July 31, 2018 sampling event at downgradient well MW-5D was removed as an outlier. Because this value is associated with a downgradient well, its removal will not affect calculated interwell background values. Because this value was anomalously high, its removal would result in the generation of more conservative (i.e., lower) background values should intrawell tests be used. Removing such outliers is recommended by USEPA's *Unified Guidance* (USEPA, 2009).

### 2.2.2 Establishment of Background Levels

Analysis of variance (ANOVA) was conducted to determine whether spatial variation was present between the two background wells (**Attachment B**). ANOVA indicated significant variation for all Appendix A parameters except pH. 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 each Appendix A parameter. Parametric tolerance limits with 99% confidence and 95% coverage were calculated for boron and calcium; non-parametric tolerance limits were calculated for chloride, fluoride, pH, sulfate, and TDS, given the non-normal distribution of data observed for these five parameters. Confidence intervals were calculated for each of these seven parameters at each compliance monitoring well. If the lower confidence limit from a compliance well exceeded the upper tolerance limit for the pooled background data, it was concluded that groundwater concentrations at compliance wells were above background concentrations. In these instances, intrawell tests would not be appropriate. Elevated concentrations of boron were observed. No significant exceedances were noted for calcium, chloride, fluoride, pH, sulfate, and TDS.

Based on the statistical evaluation, interwell statistics would be selected for boron and pH. However, Geosyntec previously prepared an alternative source demonstration arguing that existing upgradient wells MW-7D and MW-8D are not appropriate for intrawell statistics at the Landfill

based on their elevated sodium and chloride concentrations (Geosyntec, 2018c). ODEQ has since documented their agreement that interwell statistics are not viable using the existing upgradient wells (ODEQ, 2019). Therefore, intrawell tests were used to evaluate potential statistically significant increases (SSIs) for all seven Appendix A parameters.

After equality of variance was tested and identified outliers were removed (where appropriate), a parametric or non-parametric analysis was selected based on the distribution of the data and the frequency of non-detect data. Estimated results less than the practical quantitation limit (PQL) – i.e., “J-flagged” data – were considered detections and the estimated results were used in the statistical analyses. Non-parametric analyses were selected for datasets with at least 50% non-detect data or datasets that could not be normalized. Parametric analyses were selected for datasets (either transformed or untransformed) that passed the Shapiro-Wilk / Shapiro-Franca test for normality. The Kaplan-Meier non-detect adjustment was applied to datasets with between 15% and 50% non-detect data. For datasets with fewer than 15% non-detect data, non-detect data were replaced with one half of the PQL. The selected analysis (i.e., parametric or non-parametric) and transformation (where applicable) for each background dataset are shown in **Attachment B**.

Upper prediction limits (UPLs) were calculated for each Appendix A parameter to represent background values. A lower prediction limit (LPL) was also calculated for pH. To conduct the intrawell tests for boron, calcium, chloride, fluoride, pH, sulfate, and TDS, a separate UPL was calculated for each compliance well for each of these parameters. The background data used for the UPL calculations are summarized in **Table 1**; the calculated UPLs are summarized in **Table 2**.

UPLs were calculated for a one-of-two retesting procedure; i.e., if at least one sample in a series of two does not exceed the UPL, then it can be concluded that an SSI has not occurred. In practice, where a collected result did not exceed the UPL, a subsequent sample was not collected. The one-of-two retesting procedure allowed achieving an acceptably high statistical power while maintaining a site-wide false-positive rate (SWFPR) of 10% per year or less. Power curves were constructed for the intrawell parametric tests and are compared with the EPA Reference Power Curve in **Attachment B**. The power curves associated with the statistical tests for the Landfill exceed the EPA Reference Power Curve at 3 and 4 standard deviations; this is considered a “good” level of statistical power according to USEPA’s *Unified Guidance* (USEPA, 2009).

### **2.3 Conclusions**

Eight background monitoring events were completed in accordance with the CCR Rule at new compliance monitoring wells MW-4D, MW-5D, and MW-12D. The laboratory and field data were reviewed prior to statistical analysis, with no QA/QC issues identified that impacted data usability. A review of outliers identified one potential outliers, which was removed from the dataset without replacement. Prediction intervals were constructed based on the remaining background data and a one-of-two retesting procedure. Intrawell tests were selected for all seven Appendix A parameters.



### **SECTION 3**

#### **REFERENCES**

Geosyntec Consultants, Inc. (Geosyntec). 2018a. Statistical Analysis Summary – Stations 3 and 4 Landfill. Northeastern Power Station. January.

Geosyntec. 2018b. Statistical Analysis Plan – Northeastern Power Station. June 2018.

Geosyntec. 2018c. Alternative Source Demonstration Report – State and Federal CCR Rule. Northeastern Power Station. April 2018.

Oklahoma Department of Environmental Quality (ODEQ). 2019. Response to Notice of Deficiency – Alternate Source Demonstration (ASD) – Coal Combustion Residuals (CCR) Landfill. January 30, 2019.

United States Environmental Protection Agency (USEPA). 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities – Unified Guidance. EPA 530/R-09-007. March 2009.

# TABLES

**Table 1 – Groundwater Data Summary  
Northeastern - Landfill**

Parameter	Unit	MW-4D										
		5/2/2018	5/30/2018	6/27/2018	7/31/2018	8/30/2018	9/19/2018	10/15/2018	10/22/2018	11/28/2018	1/15/2019	2/27/2019
		BG	BG	BG	BG	BG	BG	BG	BG	BG	BG	2019-D1
Antimony	mg/L	0.00405 J	0.00500 U	0.00500 U	0.0000500	0.000100	0.0000400 J	0.000150	-	0.000500 U	-	-
Arsenic	mg/L	0.00230 J	0.00500 U	0.00500 U	0.00125	0.00160	0.00120	0.00228	-	0.00131	-	-
Barium	mg/L	0.171	0.173	0.167	0.173	0.163	0.177	0.166	-	0.171	-	-
Beryllium	mg/L	0.00100 U	0.00100 U	0.00100 U	0.0000100 J	0.0000490	0.0000200 J	0.0000600 J	-	0.000500 U	-	-
Boron	mg/L	1.21	1.27	1.16	1.04	1.26	1.13	0.656	-	1.24	1.16	1.42
Cadmium	mg/L	0.000140 J	0.00100 U	0.00100 U	0.0000400	0.000110	0.0000300 J	0.000160	-	0.0000600 J	-	-
Calcium	mg/L	192	164	177	196	183	174	195	-	193	183	187
Chloride	mg/L	22.0	20.0	20.0	31.0	-	31.0	37.9	39.8	27.0	24.6	31.2
Chromium	mg/L	0.00137	0.00100 U	0.00193	0.0500 U	0.000551	0.000273	0.000872	-	0.000300 J	-	-
Cobalt	mg/L	0.00236 J	0.00128 J	0.00182 J	0.000521	0.000807	0.000551	0.000873	-	0.000677	-	-
Combined Radium	pCi/L	1.63	1.99	1.24	1.51	0.912	3.91	3.06	-	1.63	-	-
Fluoride	mg/L	1.00 U	0.419 J	1.00 U	1.00 U	-	1.00 U	1.00 U	1.00 U	0.336 J	0.370 J	0.300
Lead	mg/L	0.00147 J	0.00500 U	0.00500 U	0.000130	0.000804	0.000595	0.00141	-	0.000300 J	-	-
Lithium	mg/L	0.00533	0.00330	0.00491	0.00315	0.00296	0.00289	0.00336	-	0.00378	-	-
Mercury	mg/L	0.0000250 U	0.0000250 U	0.0000250 U	0.0000250 U	0.00000700 J	0.0000250 U	0.0000250 U	-	0.0000250 U	-	0.0000250 U
Molybdenum	mg/L	0.00674	0.00491 J	0.00464 J	0.00459	0.00448	0.00371	0.00458	-	0.00800 J	-	-
Selenium	mg/L	0.00500 U	0.00500 U	0.00500 U	0.000200	0.000300	0.000200	0.000300	-	0.000200 J	-	-
Total Dissolved Solids	mg/L	984	910	882	856	886	884	846	-	972	-	696
Sulfate	mg/L	328	279	258	294	-	260	289	306	295	418	463
Thallium	mg/L	0.00119 J	0.00294	0.00294	0.0000200 J	0.0000200 J	0.000500 U	0.000500 U	-	0.00200 U	-	-
pH	SU	7.14	7.00	7.94	7.82	8.11	7.84	7.59	7.91	7.89	7.51	7.66

Notes:

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

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

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

-: Not sampled

BG: Background monitoring event

2019-D1: First detection monitoring event of 2019

**Table 1 – Groundwater Data Summary  
Northeastern - Landfill**

Parameter	Unit	MW-5D										
		5/2/2018	5/30/2018	6/27/2018	7/31/2018	8/30/2018	9/19/2018	10/15/2018	10/22/2018	11/28/2018	1/15/2019	2/27/2019
		BG	BG	BG	BG	BG	BG	BG	BG	BG	BG	2019-D1
Antimony	mg/L	0.00291 J	0.00500 U	0.00250 J	0.000160	0.000100	0.000130	0.0000700 J	-	0.000500 U	-	-
Arsenic	mg/L	0.00124 J	0.00500 U	0.00500 U	0.00127	0.000980	0.00118	0.000990	-	0.00115	-	-
Barium	mg/L	0.127	0.139	0.126	0.143	0.111	0.118	0.103	-	0.113	-	-
Beryllium	mg/L	0.00100 U	0.00100 U	0.00100 U	0.000103	0.0000760	0.0000800 J	0.0000700 J	-	0.000500 U	-	-
Boron	mg/L	0.476	0.468	0.478	0.491	0.520	0.444	0.439	-	0.612	0.540	0.531
Cadmium	mg/L	0.000360 J	0.00100 U	0.00100 U	0.000210	0.000100	0.0000900	0.0000800	-	0.0000600 J	-	-
Calcium	mg/L	132	136	134	142	158	156	141	-	143	157	130
Chloride	mg/L	25.0	24.0	26.0	30.0	-	30.0	30.2	30.3	24.0	24.0	26.7
Chromium	mg/L	0.000590 J	0.00153	0.000800 J	0.000355	0.000518	0.000745	0.000423	-	0.000500 J	-	-
Cobalt	mg/L	0.00114 J	0.00131 J	0.000630 J	0.000482	0.000300	0.000336	0.000289	-	0.000324	-	-
Combined Radium	pCi/L	2.45	3.06	2.51	2.88	2.91	5.16	5.32	-	2.39	-	-
Fluoride	mg/L	0.703 J	0.711 J	0.749 J	0.877 J	-	0.752 J	0.845 J	0.806 J	0.371 J	0.316 J	0.500
Lead	mg/L	0.00101 J	0.00109 J	0.00500 U	0.00143	0.000706	0.000720	0.000379	-	0.000400 J	-	-
Lithium	mg/L	0.0124	0.0120	0.0121	0.0110	0.0112	0.0107	0.00977	-	0.0121	-	-
Mercury	mg/L	0.0000250 U	0.0000250 U	0.0000250 U	0.0000250 U	0.00000600 J	0.0000250 U	0.0000250 U	-	0.0000250 U	-	0.0000250 U
Molybdenum	mg/L	0.00133 J	0.00500 U	0.000960 J	0.00121	0.00124	0.00200 J	0.00100 J	-	0.000200 J	-	-
Selenium	mg/L	0.00135 J	0.00500 U	0.00500 U	0.000400	0.000300	0.000400	0.000300	-	0.000300 J	-	-
Total Dissolved Solids	mg/L	636	628	658	628	648	662	636	-	614	-	616
Sulfate	mg/L	126	113	122	662	-	134	139	138	143	128	153
Thallium	mg/L	0.00125 J	0.00200 U	0.00200	0.0000200 J	0.0000400 J	0.000500 U	0.000500 U	-	0.00200 U	-	-
pH	SU	7.32	7.23	8.23	8.28	8.06	7.72	7.84	7.98	8.06	7.81	8.45

Notes:

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL).

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

-: Not sampled

BG: Background monitoring event

2019-D1: First detection monitoring event of 2019

**Table 1 – Groundwater Data Summary  
Northeastern - Landfill**

Parameter	Unit	MW-12D										
		5/2/2018	5/30/2018	6/27/2018	7/31/2018	8/30/2018	9/19/2018	10/15/2018	10/22/2018	11/28/2018	1/15/2019	2/27/2019
		BG	BG	BG	BG	BG	BG	BG	BG	BG	BG	2019-D1
Antimony	mg/L	0.00500 U	0.00500 U	0.00500 U	0.000110	0.000200	0.000360	0.000430	-	0.000300 J	-	-
Arsenic	mg/L	0.00156 J	0.00124 J	0.00500 U	0.00300	0.00339	0.00467	0.00646	-	0.00399	-	-
Barium	mg/L	0.121	0.0778	0.0362	0.0420	0.0658	0.0826	0.0502	-	0.0717	-	-
Beryllium	mg/L	0.000130 J	0.00100 U	0.00100 U	0.0000530	0.0000970	0.000100 J	0.0000600 J	-	0.000100 J	-	-
Boron	mg/L	8.63	8.35	8.45	8.72	9.71	9.02	8.68	-	9.69	9.08	8.88
Cadmium	mg/L	0.000800 J	0.000250 J	0.00100 U	0.0000700	0.000310	0.000330	0.000200	-	0.000330	-	-
Calcium	mg/L	184	89.9	74.9	108	141	110	70.0	-	103	68.0	64.7
Chloride	mg/L	17.0	91.0	17.0	22.0	-	21.0	21.0	19.4	16.0	14.6	16.8
Chromium	mg/L	0.00795	0.00274	0.00100 U	0.000414	0.00182	0.00203	0.00160	-	0.00170	-	-
Cobalt	mg/L	0.00352 J	0.00149 J	0.000390 J	0.000674	0.00217	0.00157	0.00131	-	0.000989	-	-
Combined Radium	pCi/L	1.63	1.21	1.33	0.721	3.14	4.42	3.54	-	1.49	-	-
Fluoride	mg/L	2.20	2.38	1.99	2.62	-	2.84	2.99	2.80	2.22	2.03	2.11
Lead	mg/L	0.00703	0.00304 J	0.00500 U	0.00232	0.00543	0.00518	0.00351	-	0.00412	-	-
Lithium	mg/L	0.00841	0.00608	0.00541	0.00600	0.00396	0.00410	0.00308	-	0.00483	-	-
Mercury	mg/L	0.0000130 J	0.0000250 U	0.0000250 U	0.0000250 U	0.0000250 U	0.0000120 J	0.00000700 J	-	0.00000700 J	-	0.0000250 U
Molybdenum	mg/L	0.693	0.667	0.666	0.818	0.872	0.828	0.774	-	0.744	-	-
Selenium	mg/L	0.00450 J	0.00388 J	0.00155 J	0.00170	0.00310	0.00290	0.00460	-	0.00190	-	-
Total Dissolved Solids	mg/L	1040	1090	1070	1030	1050	1050	1060	-	1070	-	1010
Sulfate	mg/L	541	542	586	662	-	582	561	504	570	437	564
Thallium	mg/L	0.00200 U	0.00220	0.00199 J	0.000106	0.000241	0.000200 J	0.000300 J	-	0.00200 U	-	-
pH	SU	7.39	7.68	8.23	8.65	9.17	8.13	9.37	8.97	8.94	8.06	8.45

Notes:

mg/L: milligrams per liter

pCi/L: picocuries per liter

SU: standard unit

U: Non-detect value. Parameters which were not detected are shown as less than the method detection limit (MDL).

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

-: Not sampled

BG: Background monitoring event

2019-D1: First detection monitoring event of 2019

**Table 2: Background Level Summary  
Northeastern Plant - Landfill**

*Geosyntec Consultants, Inc.*

Parameter	Units	MW-3D	MW-4D	MW-5D	MW-6D	MW-9D	MW-12D	MW-15
Boron	mg/L	0.985	1.521	0.647	4.44	8.22	10.3	10.7
Calcium	mg/L	195	221	172	295	483	198	136
Chloride	mg/L	16.5	46.2	35.3	34.3	409	25.6	78.0
Fluoride	mg/L	1.00	1.00	1.24	0.967	2.44	3.40	2.21
pH	SU	8.1	8.6	8.8	8.5	7.8	10.2	9.3
		6.1	6.7	6.9	5.8	6.7	6.7	6.4
Sulfate	mg/L	256	428	160	546	1576	693	656
Total Dissolved Solids	mg/L	867	1037	686	1173	3763	1158	1159

Notes:

UPL: Upper prediction limit

LPL: Lower prediction limit

Intrawell background values (UPLs) were calculated for all parameters

mg/L: milligram per liter

SU: specific unit

## ATTACHMENT A

Certification by Qualified Professional Engineer

**CERTIFICATION OF QUALIFIED PROFESSIONAL ENGINEER**

I certify that the selected and above described statistical method is appropriate for evaluating the groundwater monitoring data for the Northeastern Stations 3 & 4 Landfill CCR management area and that the requirements of OAC 252:517-9-4(e) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



26057

License Number

OKLAHOMA

Licensing State

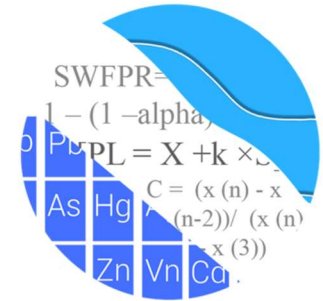
07.19.19

Date



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

## GROUNDWATER STATS CONSULTING



July 19, 2019

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

Dear Ms. Kreinberg,

Groundwater Stats Consulting, formerly the statistical consulting division of Sanitas Technologies, is pleased to provide the screening and statistical analysis of background groundwater data for American Electric Power's Northeastern Landfill. The analysis complies with the federal rule for the Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule, 2015) as well as with the USEPA Unified Guidance (2009).

Sampling began at the Northeastern Landfill for the CCR program in 2016, and at least 8 background samples have been collected at each of the groundwater monitoring wells. The monitoring well network, as provided by Geosyntec Consultants, consists of the following: background wells MW-7D and MW-8D; and compliance wells MW-3D, MW-4D, MW-5D, MW-6D, MW-9D, MW-12D and MW-15. Downgradient wells MW-4D, MW-5D and MW-12D were added at a later date to the monitoring well network and are included in the attached screening.

Data were sent electronically to Groundwater Stats Consulting, and the statistical analysis was reviewed by Dr. Kirk Cameron, PhD Statistician with MacStat Consulting, primary author of the USEPA Unified Guidance, and Senior Advisor to Groundwater Stats Consulting.

The following constituents were evaluated: Appendix A parameters – boron, calcium, chloride, fluoride, pH, sulfate, and TDS; and Appendix B parameters - antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, combined radium 226 & 228, fluoride, lead, lithium, mercury, molybdenum, selenium, and thallium.

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

Data at all wells were evaluated for the following: 1) outliers; 2) trends; 3) most appropriate statistical method for Appendix 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. Power curves are provided to demonstrate that the selected statistical methods for Appendix A parameters comply with the USEPA Unified Guidance recommendations as discussed below.

### **Summary of Statistical Method:**

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

Parametric prediction limits are utilized when the screened historical data follow a normal or transformed-normal distribution. When data cannot be normalized or the majority of data are nondetects, 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.

- No statistical analyses are required on wells and analytes containing 100% nondetects (USEPA Unified Guidance, 2009, Chapter 6).
- When data contain <15% nondetects in background, simple substitution of one-half the reporting limit is utilized in the statistical analysis. The reporting limit utilized for nondetects is the practical quantification limit (PQL) as reported by the laboratory.
- When data contain between 15-50% nondetects, the Kaplan-Meier nondetect 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% nondetects.

## **Background Screening**

### Outlier Evaluation

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

Tukey's outlier test noted a few outliers that were flagged in the database, and may be seen on the Outlier Data Summary Table. Well MW-7D had observations reported during the 9/20/17 sample event that appeared different from other measurements within the same well; however, these values were not identified as outliers when tested with Tukey's test. These values were flagged as may be seen on the outlier summary table (i.e. beryllium, chromium and cobalt).

Additionally, Tukey's test did not identify the reported measurement of 0.642 mg/L for fluoride in well MW-15; however, this value was significantly lower than the other measurements in this well and was flagged as an outlier in the database. Some low values exist in the data sets and appear on the graphs as possible low outliers relative to the Practical Quantitation Limit. However, these values are observed trace values (i.e. measurements reported by the laboratory between the Method Detection Limit and the Practical Quantitation Limit) and, therefore, were not flagged as outliers. A substitution of the most recent reporting limit was applied when varying detection limits existed in data.

No true seasonal patterns were observed on the time series plots for any of the detected data; therefore, no deseasonalizing adjustments were made to the data. 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. It was noted that for each constituent evaluated, the highest concentrations are reported in the upgradient wells.

While trends may be visual, a quantification of the trend and its significance is needed. The Sen's Slope/Mann Kendall trend test was used to evaluate all data at each well to identify statistically significant increasing or decreasing trends (Figure D). In the absence of suspected contamination, significant trending data are typically not included as part of the background data used for construction of prediction limits. This step serves to eliminate the trend and, thus, reduce variation in background. When statistically significant decreasing trends are present, earlier data are evaluated to determine whether earlier concentration levels are significantly different than current reported concentrations and will be deselected as necessary. When the historical records of data are truncated for the reasons above, a summary report will be provided to show the date ranges used in construction of the statistical limits.

The results of the trend analyses showed several statistically significant increasing trends, primarily in background wells; and a few statistically significant decreasing trends, as may be seen on the Trend Test Summary table. No adjustments were made to the datasets at this time, since the majority of trends were noted in background wells and limited data are available at this time. Trends noted in background wells are generally an indication that concentrations are changing due to natural variation. However, as more data are collected, if it is determined that earlier measurements are no longer representative of present-day water quality, the records will be re-evaluated for possible truncation of earlier concentrations.

#### 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 (Figure E). Interwell tests, which compare downgradient well data to statistical limits constructed from pooled upgradient well data, are appropriate when average concentrations are similar across upgradient wells. Intrawell tests, which compare compliance data from a single well to screened historical data within the same well, are appropriate when upgradient wells exhibit spatial variation; when statistical limits constructed from upgradient wells would not be conservative from a regulatory perspective; and when downgradient water quality is unimpacted compared to upgradient water quality for the same parameter.

The ANOVA identified variation for the majority of Appendix A parameters. Therefore, all parameters were further evaluated as described below for the appropriateness of intrawell prediction limits to accommodate the groundwater quality. A summary table of the ANOVA results is included with the reports.

## Appendix A - Statistical Limits

Intrawell limits constructed from carefully screened background data from within each well serve to provide statistical limits that will rapidly identify a change in more recent compliance data from within a given well. This statistical method removes the element of variation across wells and eliminates the chance of mistaking natural spatial variation for a release from the facility. Prior to performing intrawell prediction limits, several steps are required to reasonably demonstrate downgradient water quality does not have existing impacts from the practices of the facility.

Exploratory data analysis was used as a general comparison of concentrations in downgradient wells for all Appendix A parameters recommended for intrawell analyses to concentrations reported in upgradient wells. Upper tolerance limits are used in conjunction with confidence intervals to determine whether the estimated averages in downgradient wells are higher than observed levels upgradient of the facility. The upper tolerance limits were constructed to represent the extreme upper range of possible background levels at the site.

In cases where downgradient average concentrations are higher than observed concentrations upgradient for a given constituent, an independent study and hydrogeological investigation are 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. However, further discussion is included below regarding the use of intrawell prediction limits.

Parametric tolerance limits were constructed with a target of 99% confidence and 95% coverage using pooled upgradient well data for each of the Appendix A parameters (Figure F). 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.

Confidence intervals were constructed on downgradient wells for each of the Appendix A parameters, using the tolerance limits discussed above, to determine intrawell eligibility (Figure G). When the entire confidence interval is above a background standard for a given parameter, interwell methods are initially recommended as the statistical method.

Therefore, only parameters with confidence intervals which did not exceed background standards are eligible for intrawell prediction limits.

Confidence intervals for the above parameters were found to be within their respective background limits for all parameters except for boron. However, previous correspondence between Oklahoma Department of Environmental Quality and AEP demonstrates that due to natural variation in groundwater as well as changes in direction of groundwater flow, the background wells are not representative of upgradient groundwater quality in which case interwell statistical limits are not recommended. Therefore, all Appendix A parameters are evaluated using intrawell methods.

All available data through November 2017 at each of the existing wells and through January 2019 through the new wells were used to establish intrawell background limits based on a 1-of-2 resample plan that will be used for future comparisons of compliance measurements during each subsequent semi-annual sampling event (Figure H).

Natural systems continuously evolve due to physical changes made to the environment. Examples include capping an ash pond, 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 are 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 in order 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.

In the event of an initial exceedance of compliance well data, the 1-of-2 resample plan allows for collection of up to two additional samples to determine whether the initial exceedance is confirmed. If either of the resamples fall within the statistical limit, the initial exceedance is considered to be a false positive result and, therefore, no further action is necessary. A summary table of the background prediction limits follows this letter.

#### Appendix IV – Assessment Monitoring Program

During an Assessment Monitoring program confidence intervals are constructed at all wells for detected Appendix IV parameters. A minimum of 4 samples is required to construct confidence intervals; however, 8 samples are generally recommended for better representation of the true average population. Established Maximum Contaminant Levels (MCLs) are used as the GWPS comparisons or Regional Screening Levels (RSLs) for

parameters without MCLs, unless background limits are higher as discussed below. Parametric confidence intervals are constructed with 99% confidence when data follow a normal or transformed-normal distribution. For all other cases, nonparametric confidence intervals are constructed, with the confidence level based on the number of samples available. The GWPS is exceeded only when the entire confidence interval exceeds its respective GWPS.

Background limits are established for the Appendix IV parameters using upper tolerance limits constructed with 95% confidence/95% coverage using pooled upgradient well data, for comparison against established MCLs or RSLs (for lead, cobalt, lithium and molybdenum). When background limits, or Alternate Contaminant Levels (ACLs), are higher than established MCLs or RSLs, the CCR Rule recommends using these ACLs as the GWPS for the confidence interval comparisons. Since the scope of this project included screening and development of background limits for Appendix A Detection Monitoring statistics, comparison of the Appendix IV parameters with confidence intervals was not included in this report.

### Recommendations

In summary, as a result of the background screening described in this letter, intrawell prediction limits combined with a 1-of-2 resample plan are recommended for all Appendix A parameters. The statistical analyses will be constructed according to the USEPA Unified Guidance, based on 7 Appendix A parameters and 7 downgradient wells.

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 me.

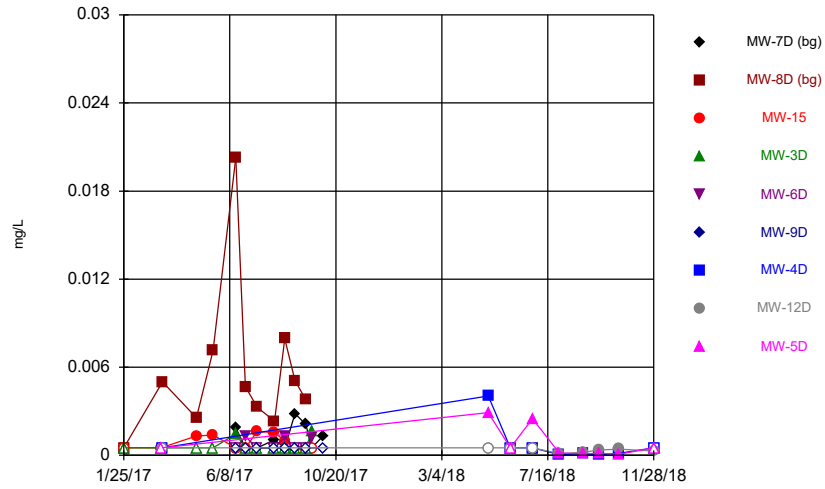
For Groundwater Stats Consulting,

A handwritten signature in cursive script that reads "Kristina Rayner". The signature is written in black ink and is positioned below the typed name.

Kristina L. Rayner  
Groundwater Statistician

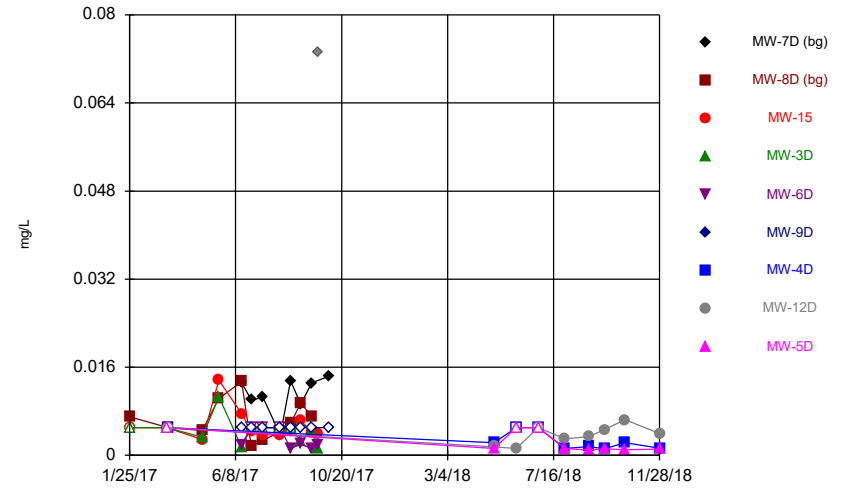


Time Series



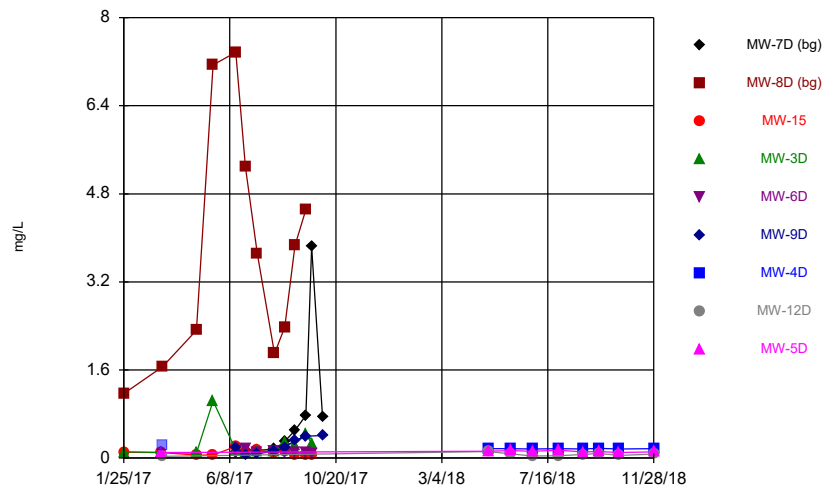
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Time Series



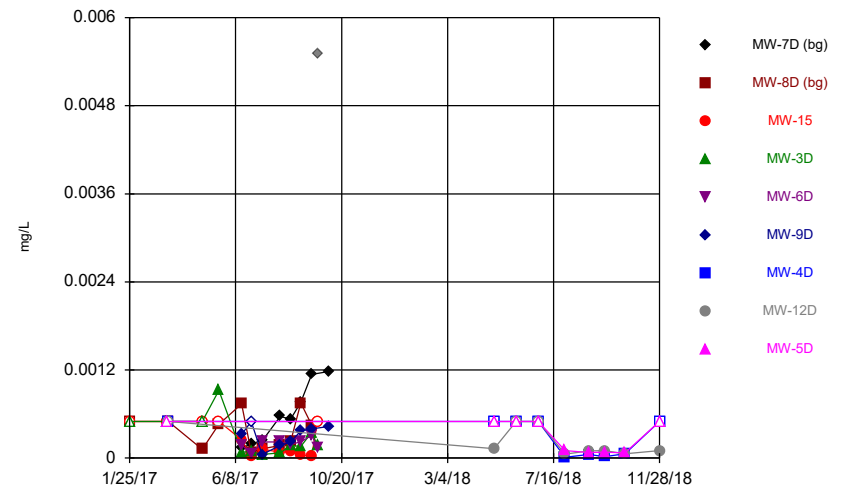
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Time Series



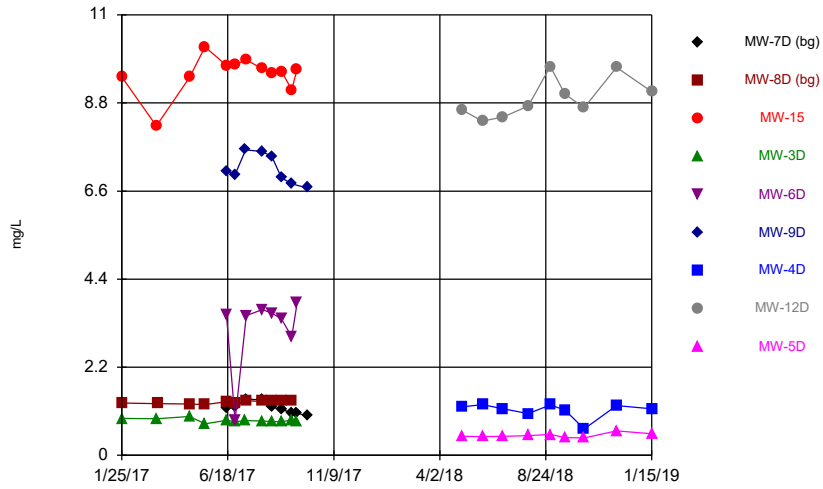
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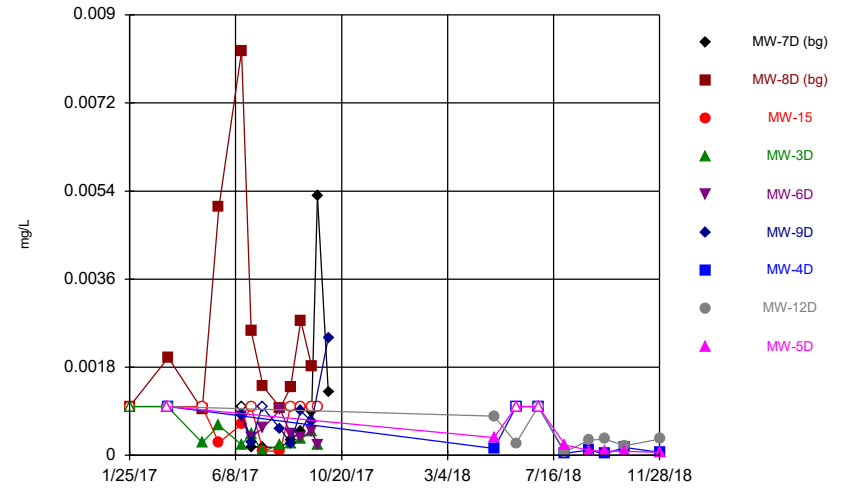
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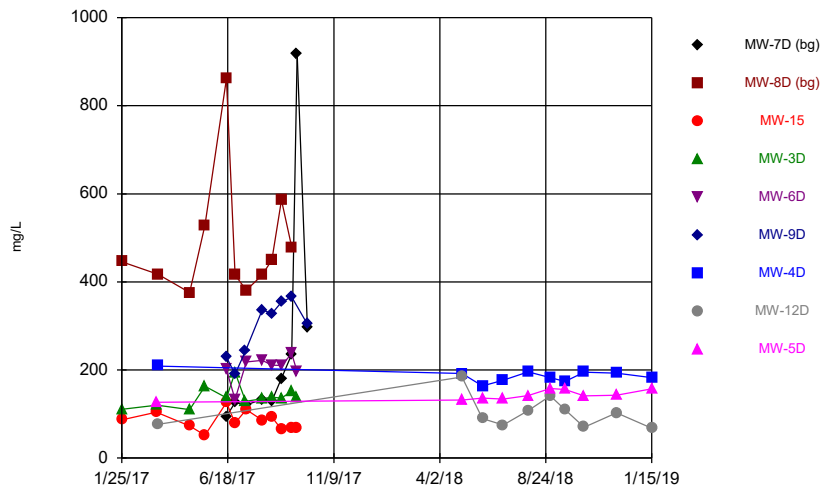
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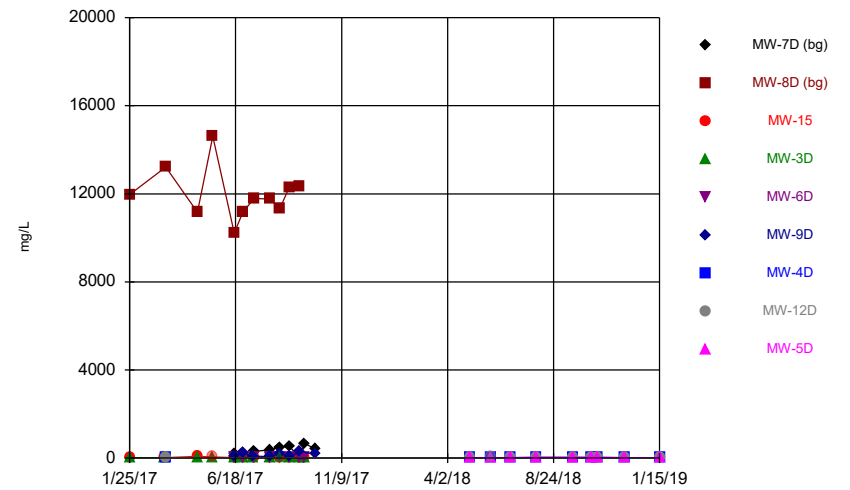
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Time Series



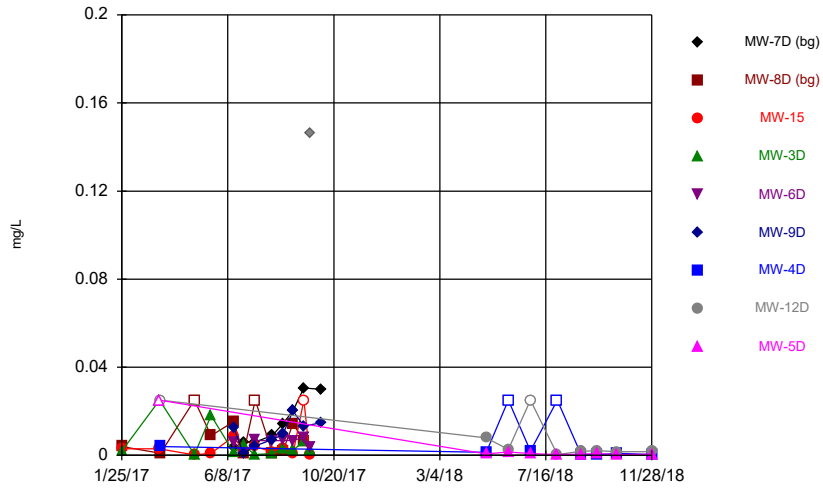
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Time Series



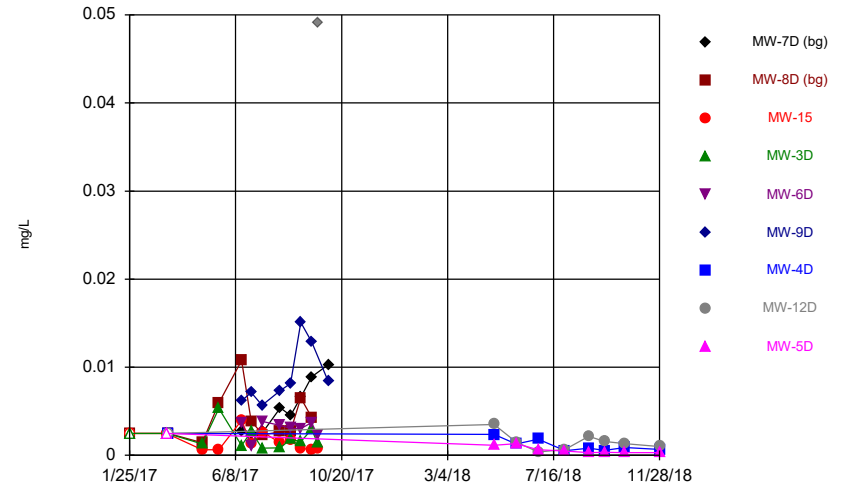
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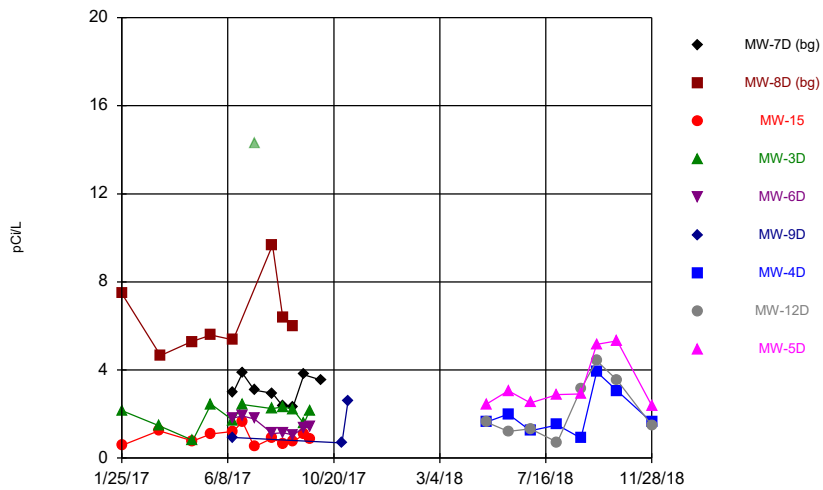
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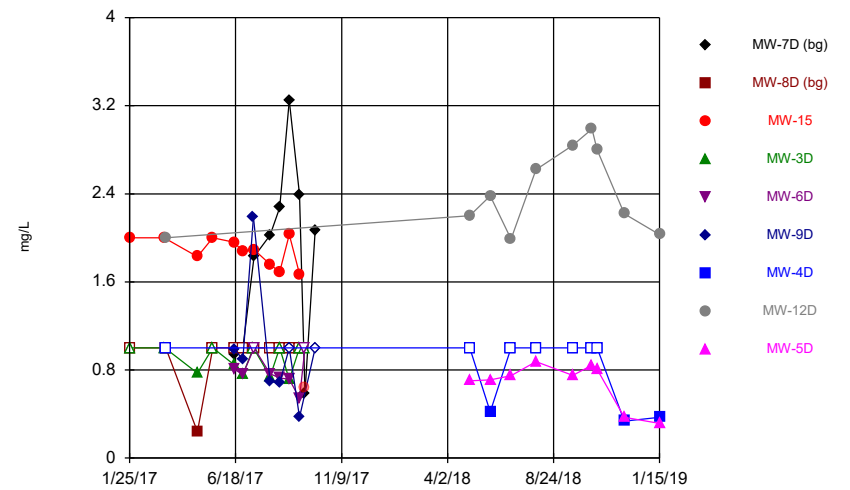
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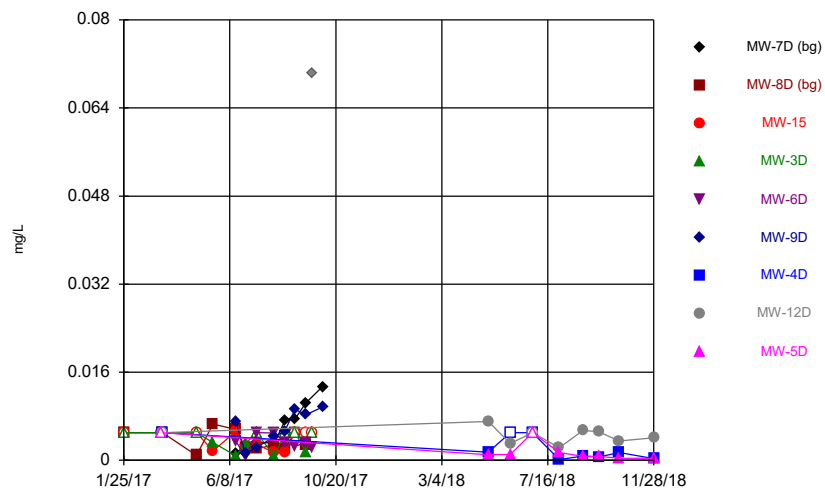
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### Time Series



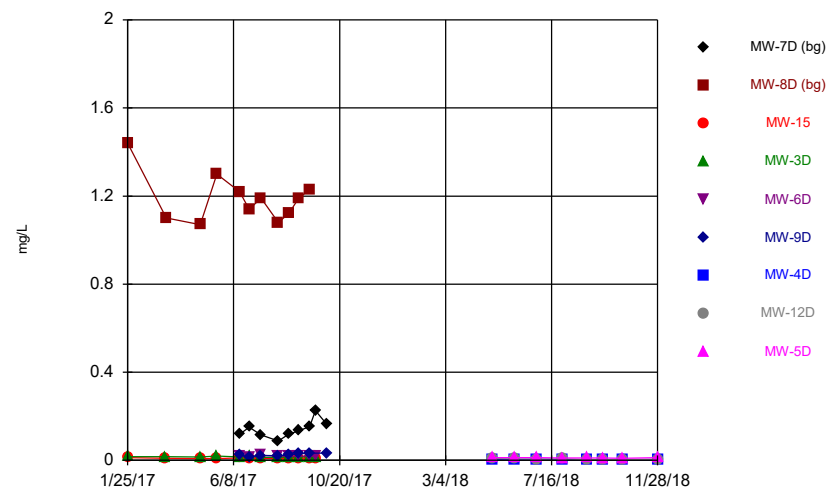
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Time Series



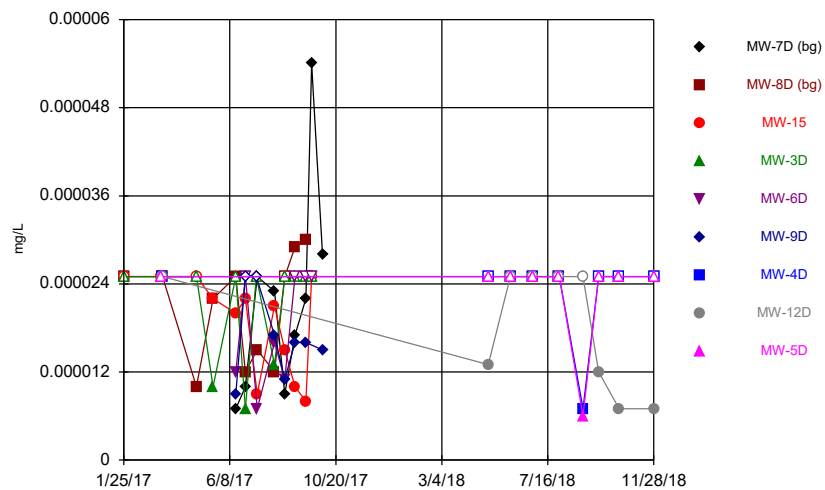
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Northeastern LF Client: Geosyntec Data: Northeastern LF

Time Series



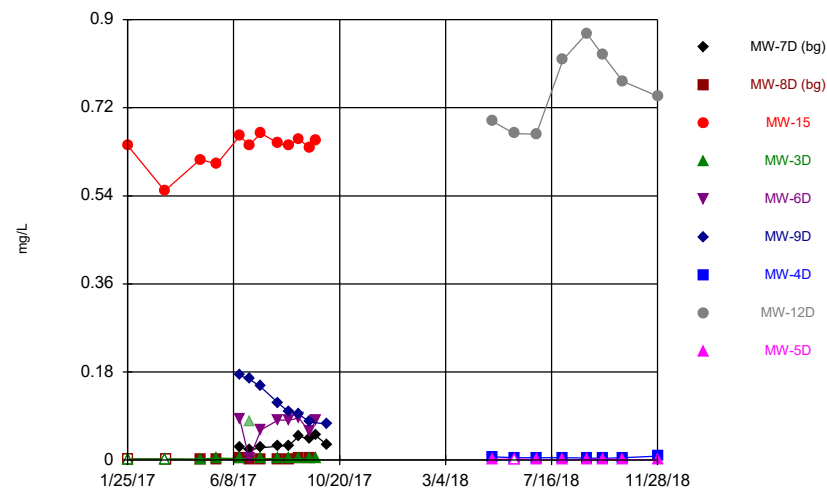
Constituent: Lithium Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Time Series



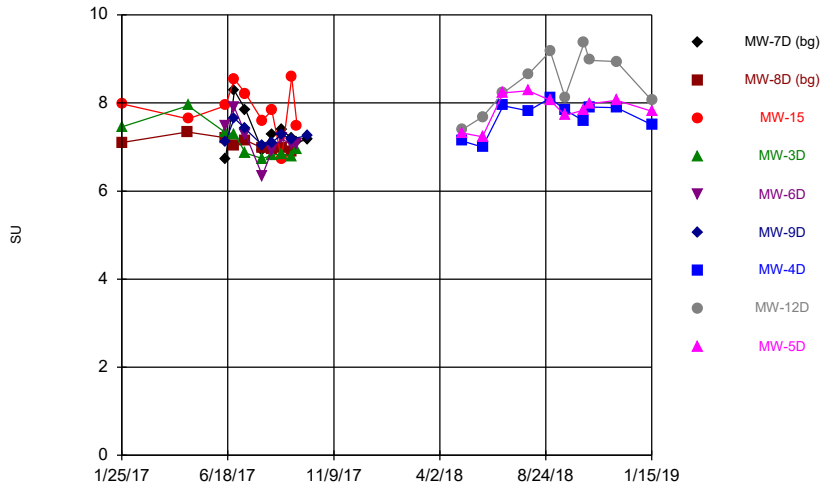
Constituent: Mercury Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Time Series



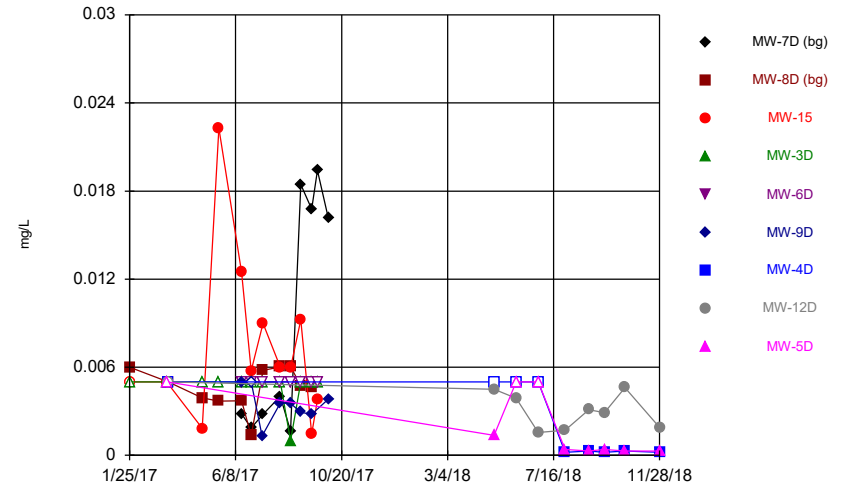
Constituent: Molybdenum Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Time Series



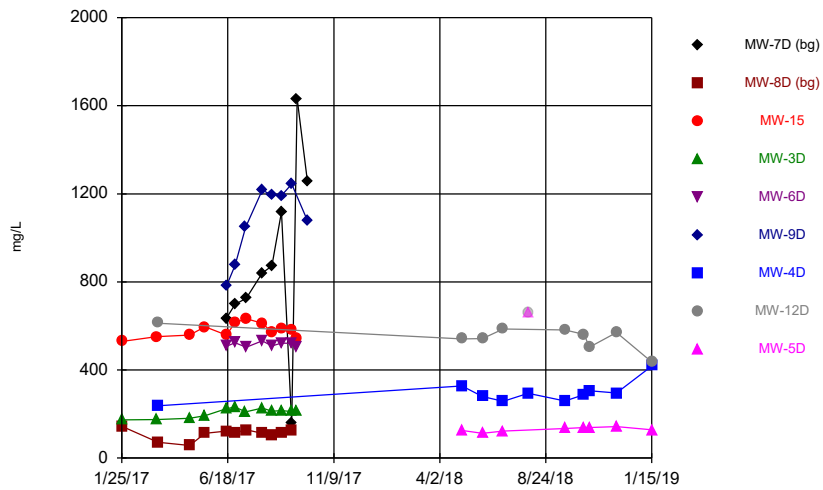
Constituent: pH, field Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Time Series



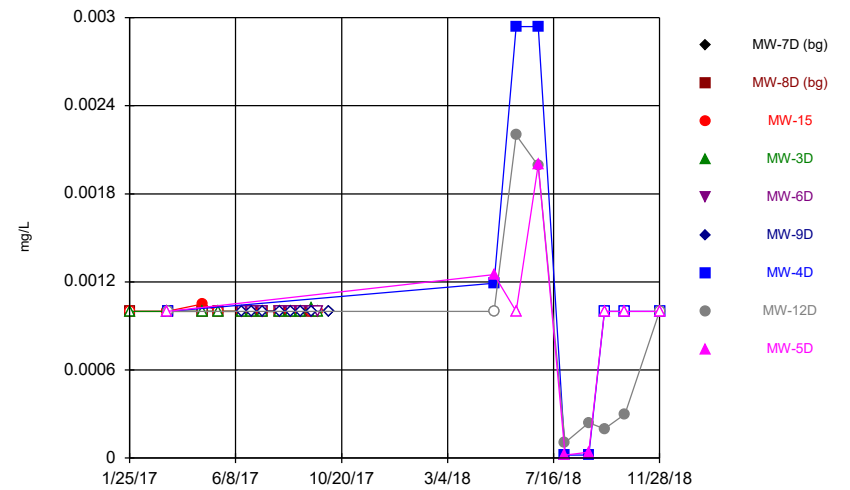
Constituent: Selenium Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Time Series



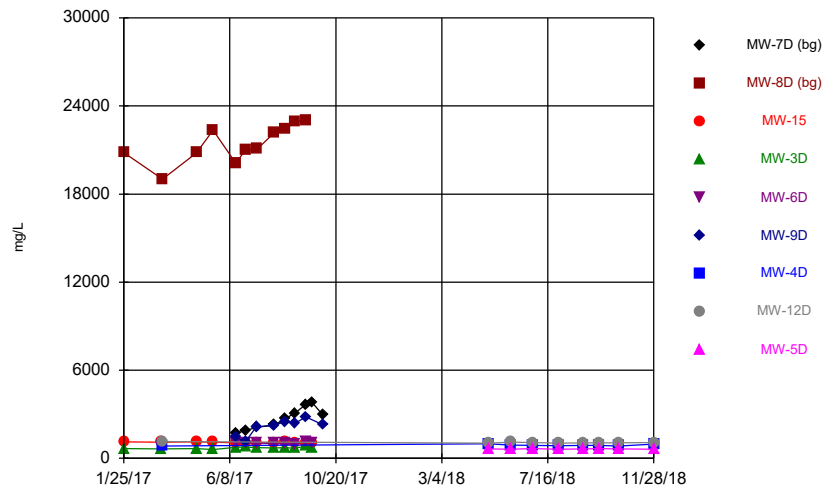
Constituent: Sulfate Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Time Series



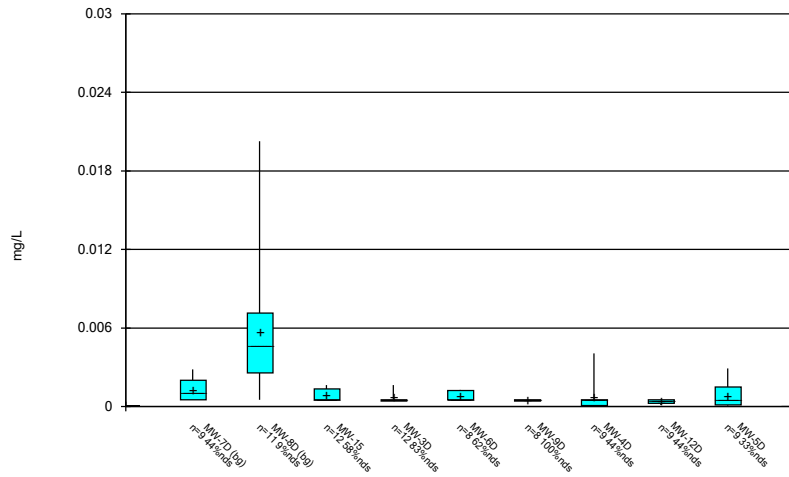
Constituent: Thallium Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Time Series



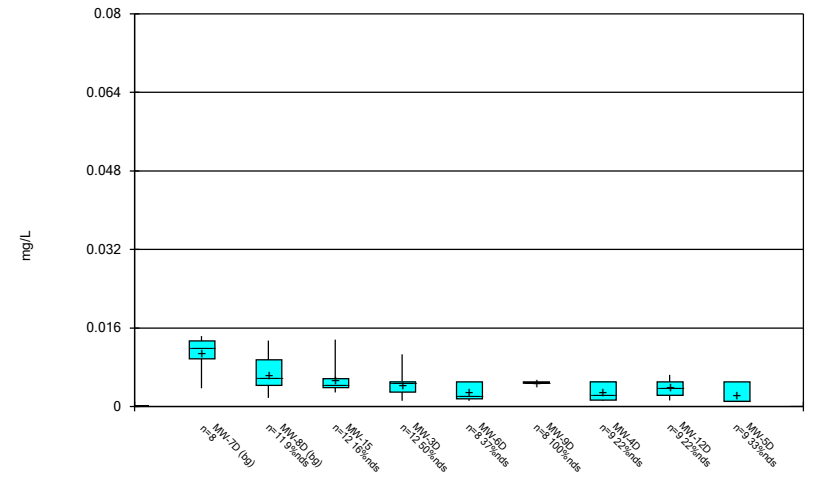
Constituent: Total Dissolved Solids [TDS] Analysis Run 3/21/2019 9:27 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



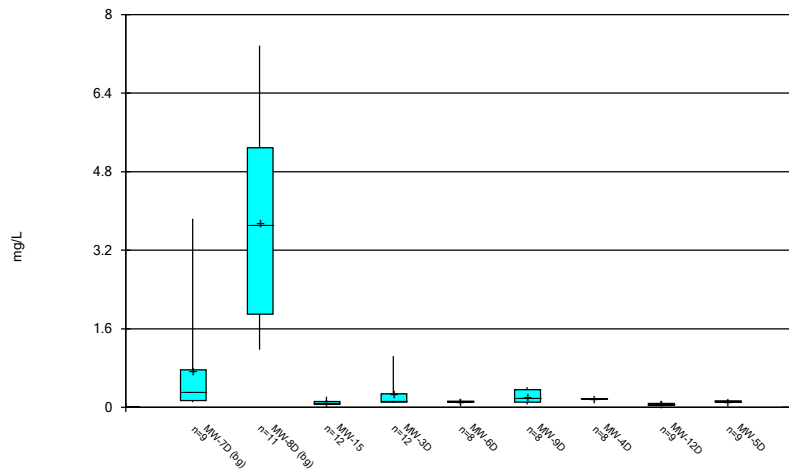
Constituent: Antimony Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



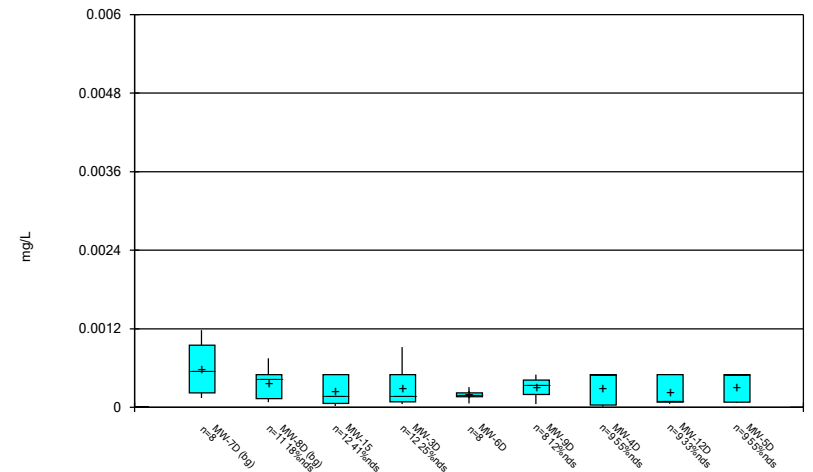
Constituent: Arsenic Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



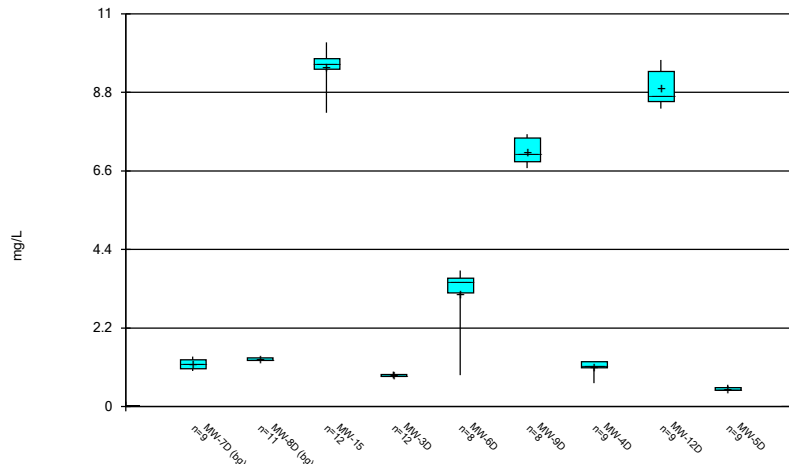
Constituent: Barium Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



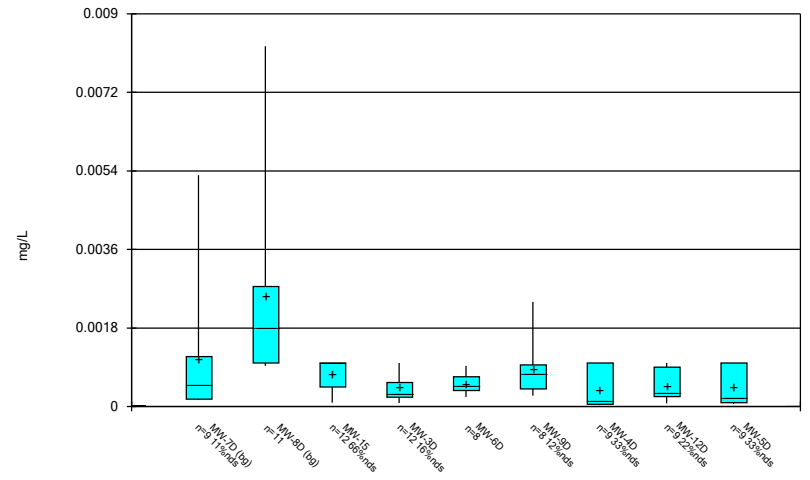
Constituent: Beryllium Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



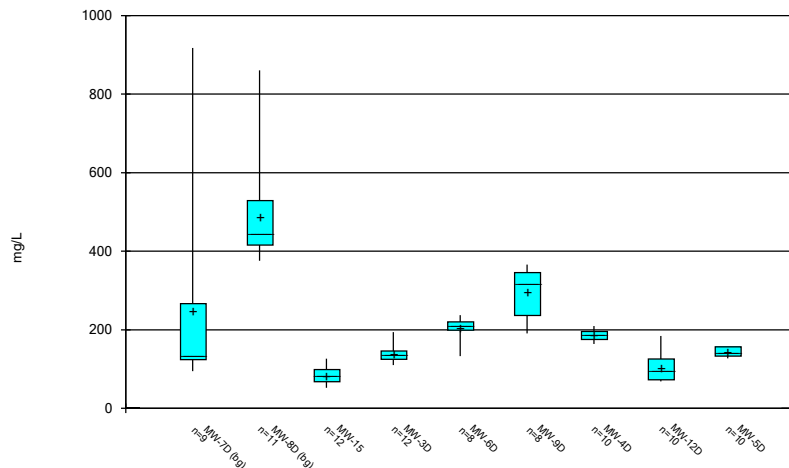
Constituent: Boron Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



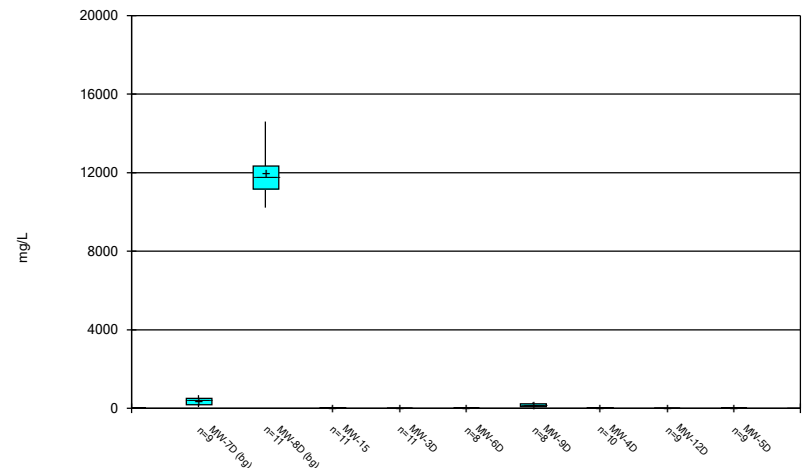
Constituent: Cadmium Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



Constituent: Calcium Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

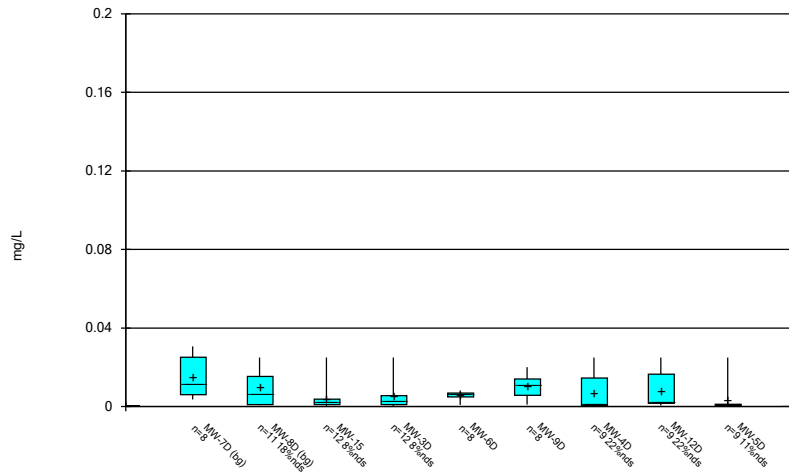
Box & Whiskers Plot



Constituent: Chloride Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

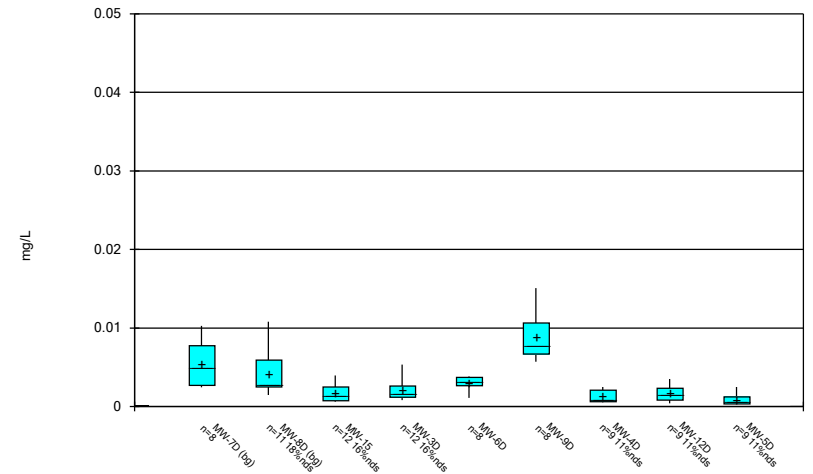


### Box & Whiskers Plot



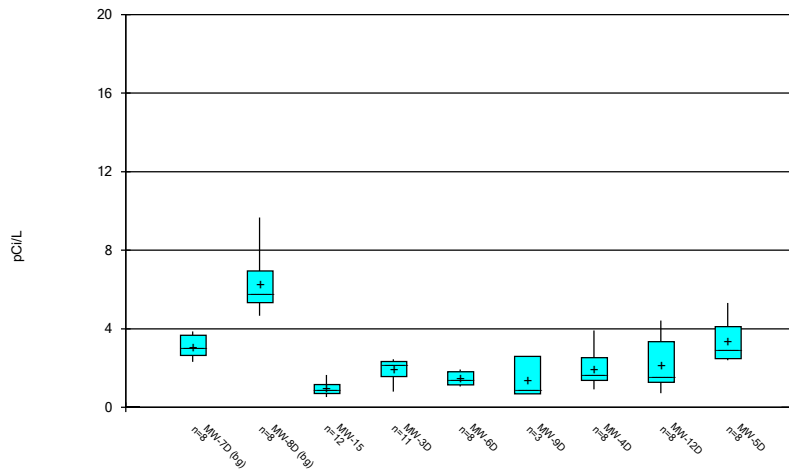
Constituent: Chromium Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



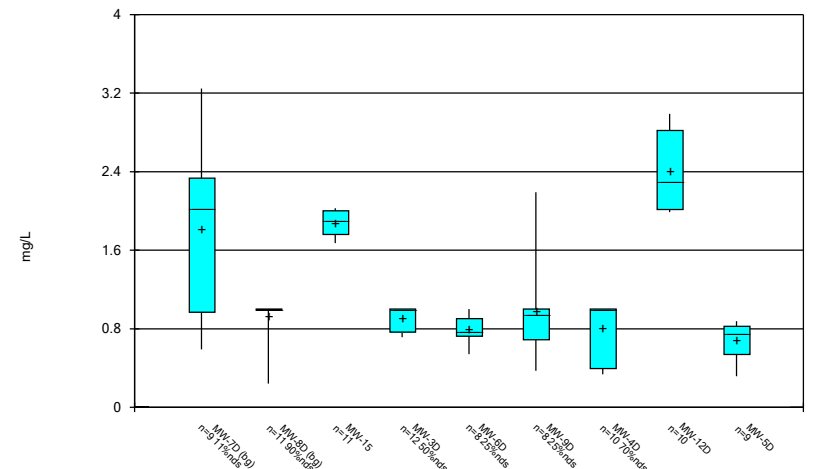
Constituent: Cobalt Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



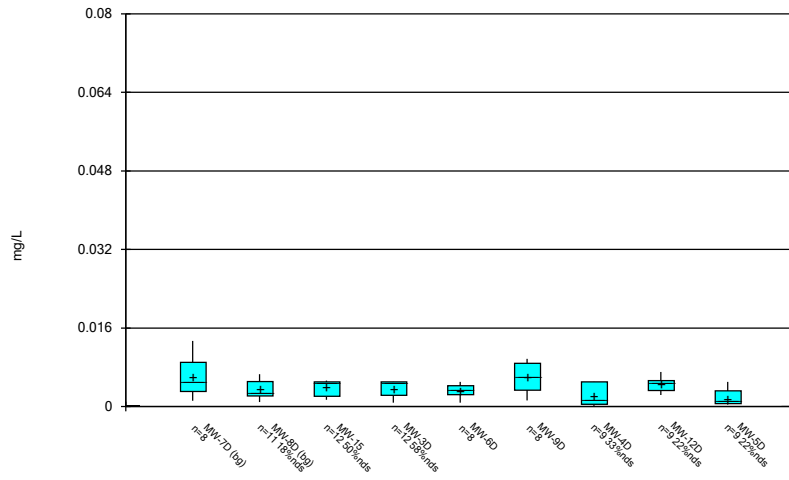
Constituent: Combined Radium 226 + 228 Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



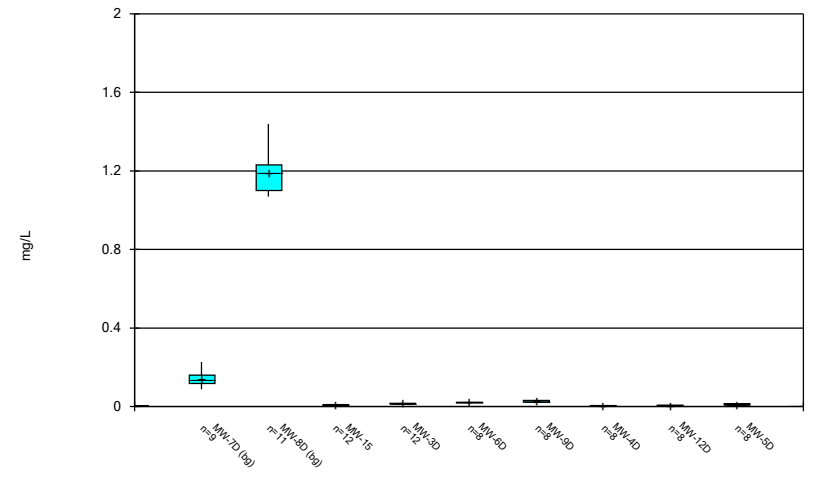
Constituent: Fluoride Analysis Run 3/21/2019 9:29 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



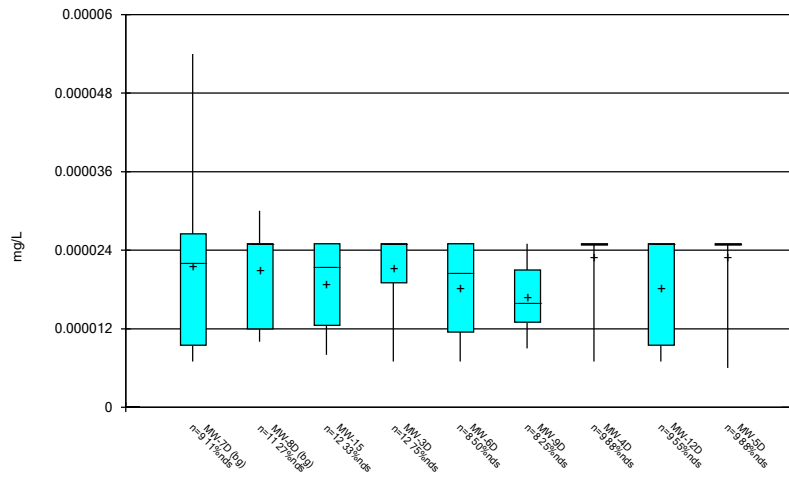
Constituent: Lead Analysis Run 3/21/2019 9:30 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



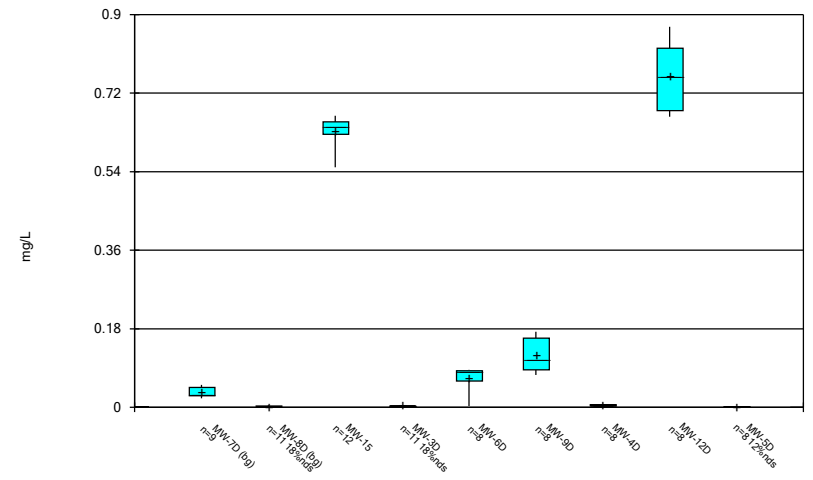
Constituent: Lithium Analysis Run 3/21/2019 9:30 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



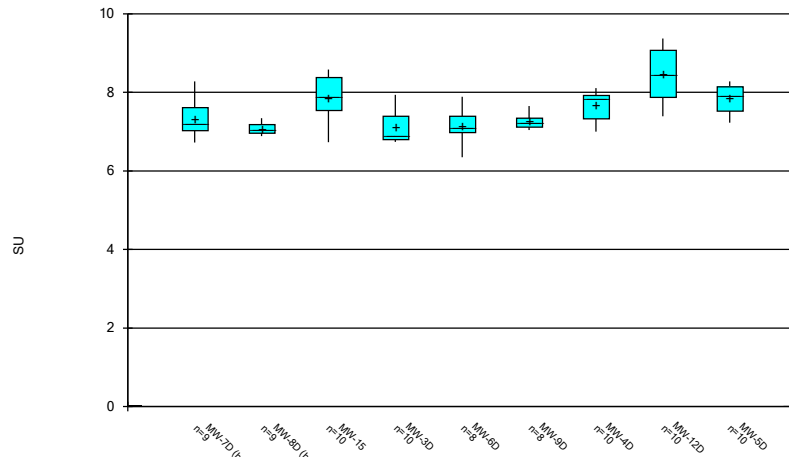
Constituent: Mercury Analysis Run 3/21/2019 9:30 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



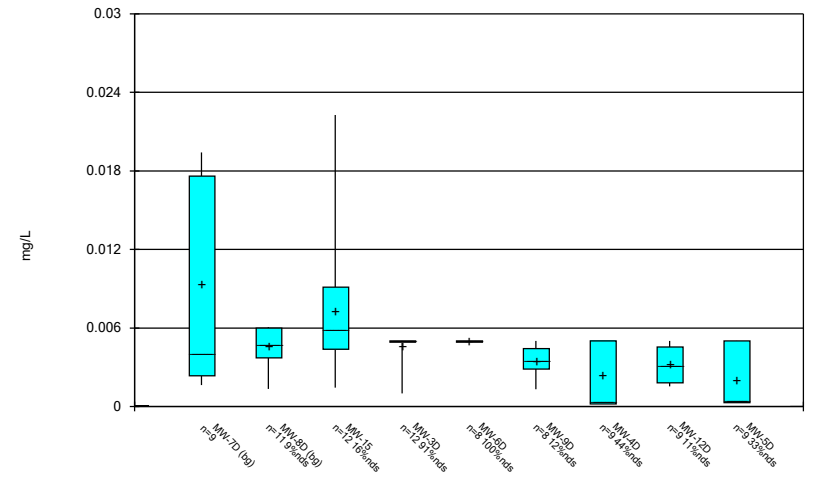
Constituent: Molybdenum Analysis Run 3/21/2019 9:30 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



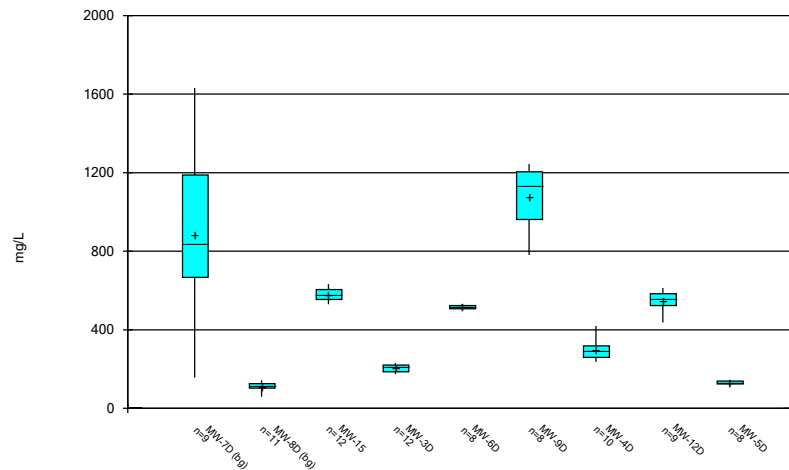
Constituent: pH, field Analysis Run 3/21/2019 9:30 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



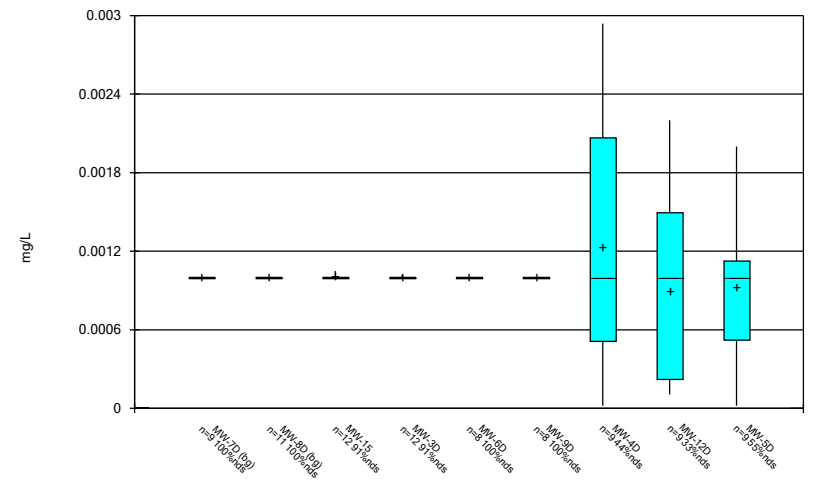
Constituent: Selenium Analysis Run 3/21/2019 9:30 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



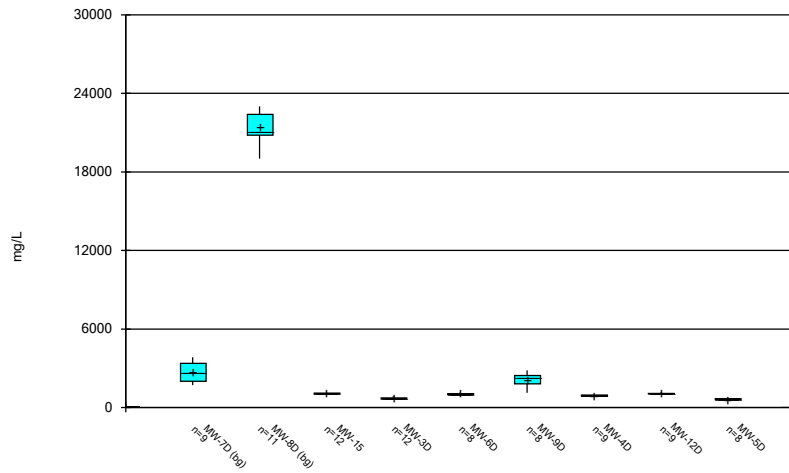
Constituent: Sulfate Analysis Run 3/21/2019 9:30 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Box & Whiskers Plot



Constituent: Thallium Analysis Run 3/21/2019 9:30 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Box & Whiskers Plot



Constituent: Total Dissolved Solids [TDS] Analysis Run 3/21/2019 9:30 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

# Outlier Summary

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 7/16/2019, 10:59 AM

MW-7D Arsenic (mg/L) MW-4D Barium (mg/L) MW-7D Beryllium (mg/L) MW-15 Chloride (mg/L) MW-3D Chloride (mg/L) MW-12D Chloride (mg/L) MW-7D Chromium (mg/L) MW-7D Cobalt (mg/L) MW-3D Combined Radium 226 + 228 (pCi/L) MW-15 Fluoride (mg/L)

Date	MW-7D Arsenic (mg/L)	MW-4D Barium (mg/L)	MW-7D Beryllium (mg/L)	MW-15 Chloride (mg/L)	MW-3D Chloride (mg/L)	MW-12D Chloride (mg/L)	MW-7D Chromium (mg/L)	MW-7D Cobalt (mg/L)	MW-3D Combined Radium 226 + 228 (pCi/L)	MW-15 Fluoride (mg/L)
3/15/2017		0.225 (o)								
5/18/2017			111 (o)							
6/28/2017										
7/12/2017								14.283 (o)		
8/17/2017				23 (o)						
9/20/2017	0.07314 (o)		0.0055 (o)				0.146 (o)	0.04905 (o)		0.642 (o)
5/30/2018						91 (o)				
7/31/2018										

MW-7D Lead (mg/L) MW-3D Molybdenum (mg/L) MW-12D Sulfate (mg/L) MW-5D Sulfate (mg/L)

Date	MW-7D Lead (mg/L)	MW-3D Molybdenum (mg/L)	MW-12D Sulfate (mg/L)	MW-5D Sulfate (mg/L)
3/15/2017				
5/18/2017				
6/28/2017		0.07928 (o)		
7/12/2017				
8/17/2017				
9/20/2017	0.07031 (o)			
5/30/2018				
7/31/2018		662 (o)	662 (o)	

# Outlier Analysis - Significant Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 7/16/2019, 10:57 AM

Constituent	Well	Outlier	Value(s)	Method	N	Mean	Std. Dev.	Distribution	Normality Test
Arsenic (mg/L)	MW-7D (bg)	Yes	0.07314	NP	9	0.01788	0.02098	In(x)	ShapiroWilk
Barium (mg/L)	MW-4D	Yes	0.225	NP	9	0.1762	0.01877	In(x)	ShapiroWilk
Chloride (mg/L)	MW-15	Yes	111	NP	12	32.25	30.12	In(x)	ShapiroWilk
Chloride (mg/L)	MW-3D	Yes	23	NP	12	13.58	3.288	In(x)	ShapiroWilk
Chloride (mg/L)	MW-12D	Yes	91	NP	10	25.5	23.15	In(x)	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-3D	Yes	14.28	NP	12	2.982	3.592	In(x)	ShapiroWilk
Molybdenum (mg/L)	MW-3D	Yes	0.07928	NP	12	0.009283	0.02205	In(x)	ShapiroWilk
Sulfate (mg/L)	MW-5D	Yes	662	NP	9	189.4	177.5	In(x)	ShapiroWilk

# Outlier Analysis - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 7/16/2019, 10:57 AM

Constituent	Well	Outlier	Value(s)	Method	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.003241	0.001742	ln(x)	ShapiroWilk
Antimony (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.006095	0.005012	ln(x)	ShapiroWilk
Antimony (mg/L)	MW-15	No	n/a	NP	12	0.003489	0.001873	ln(x)	ShapiroWilk
Antimony (mg/L)	MW-3D	n/a	n/a	NP	12	0.004422	0.001349	unknown	ShapiroWilk
Antimony (mg/L)	MW-6D	No	n/a	NP	8	0.00359	0.001946	ln(x)	ShapiroWilk
Antimony (mg/L)	MW-9D	n/a	n/a	NP	8	0.005	0	unknown	ShapiroWilk
Antimony (mg/L)	MW-4D	No	n/a	NP	9	0.00221	0.002443	ln(x)	ShapiroWilk
Antimony (mg/L)	MW-12D	No	n/a	NP	9	0.002378	0.002489	ln(x)	ShapiroWilk
Antimony (mg/L)	MW-5D	No	n/a	NP	9	0.001819	0.002099	ln(x)	ShapiroWilk
<b>Arsenic (mg/L)</b>	<b>MW-7D (bg)</b>	<b>Yes</b>	<b>0.07314</b>	<b>NP</b>	<b>9</b>	<b>0.01788</b>	<b>0.02098</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Arsenic (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.006484	0.003466	x^(1/3)	ShapiroWilk
Arsenic (mg/L)	MW-15	No	n/a	NP	12	0.005394	0.002875	ln(x)	ShapiroWilk
Arsenic (mg/L)	MW-3D	No	n/a	NP	12	0.004473	0.002424	x^(1/3)	ShapiroWilk
Arsenic (mg/L)	MW-6D	No	n/a	NP	8	0.002919	0.001756	ln(x)	ShapiroWilk
Arsenic (mg/L)	MW-9D	n/a	n/a	NP	8	0.005	0	unknown	ShapiroWilk
Arsenic (mg/L)	MW-4D	No	n/a	NP	9	0.002771	0.00172	ln(x)	ShapiroWilk
Arsenic (mg/L)	MW-12D	No	n/a	NP	9	0.003812	0.0017	normal	ShapiroWilk
Arsenic (mg/L)	MW-5D	No	n/a	NP	9	0.002423	0.001935	ln(x)	ShapiroWilk
Barium (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.7454	1.19	ln(x)	ShapiroWilk
Barium (mg/L)	MW-8D (bg)	No	n/a	NP	11	3.756	2.143	ln(x)	ShapiroWilk
Barium (mg/L)	MW-15	No	n/a	NP	12	0.09759	0.0489	ln(x)	ShapiroWilk
Barium (mg/L)	MW-3D	No	n/a	NP	12	0.2538	0.2682	ln(x)	ShapiroWilk
Barium (mg/L)	MW-6D	No	n/a	NP	8	0.1131	0.02738	ln(x)	ShapiroWilk
Barium (mg/L)	MW-9D	No	n/a	NP	8	0.222	0.1398	x^(1/3)	ShapiroWilk
<b>Barium (mg/L)</b>	<b>MW-4D</b>	<b>Yes</b>	<b>0.225</b>	<b>NP</b>	<b>9</b>	<b>0.1762</b>	<b>0.01877</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Barium (mg/L)	MW-12D	No	n/a	NP	9	0.06426	0.02825	ln(x)	ShapiroWilk
Barium (mg/L)	MW-5D	No	n/a	NP	9	0.1199	0.01516	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.00114	0.001679	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.0004655	0.0003544	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-15	No	n/a	NP	12	0.0004692	0.0004722	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-3D	No	n/a	NP	12	0.0004217	0.00042	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-6D	No	n/a	NP	8	0.0001925	0.00007226	normal	ShapiroWilk
Beryllium (mg/L)	MW-9D	No	n/a	NP	8	0.00037	0.0002851	x^(1/3)	ShapiroWilk
Beryllium (mg/L)	MW-4D	No	n/a	NP	9	0.0005154	0.0004829	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-12D	No	n/a	NP	9	0.0003933	0.0004556	ln(x)	ShapiroWilk
Beryllium (mg/L)	MW-5D	No	n/a	NP	9	0.0005366	0.0004592	ln(x)	ShapiroWilk
Boron (mg/L)	MW-7D (bg)	No	n/a	NP	9	1.183	0.1416	ln(x)	ShapiroWilk
Boron (mg/L)	MW-8D (bg)	No	n/a	NP	11	1.324	0.03585	x^3	ShapiroWilk
Boron (mg/L)	MW-15	No	n/a	NP	12	9.52	0.482	x^6	ShapiroWilk
Boron (mg/L)	MW-3D	No	n/a	NP	12	0.8698	0.04713	ln(x)	ShapiroWilk
Boron (mg/L)	MW-6D	No	n/a	NP	8	3.156	0.9525	x^6	ShapiroWilk
Boron (mg/L)	MW-9D	No	n/a	NP	8	7.146	0.3683	ln(x)	ShapiroWilk
Boron (mg/L)	MW-4D	No	n/a	NP	9	1.125	0.1902	x^6	ShapiroWilk
Boron (mg/L)	MW-12D	No	n/a	NP	9	8.926	0.4975	ln(x)	ShapiroWilk
Boron (mg/L)	MW-5D	No	n/a	NP	9	0.4964	0.05414	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.001086	0.001634	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.002558	0.002236	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-15	No	n/a	NP	12	0.0007567	0.0003841	normal	ShapiroWilk
Cadmium (mg/L)	MW-3D	No	n/a	NP	12	0.000425	0.0003052	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-6D	No	n/a	NP	8	0.0005213	0.0002371	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-9D	No	n/a	NP	8	0.0008563	0.0006827	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-4D	No	n/a	NP	9	0.0003933	0.000457	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-12D	No	n/a	NP	9	0.0004767	0.0003564	ln(x)	ShapiroWilk
Cadmium (mg/L)	MW-5D	No	n/a	NP	9	0.0004333	0.0004347	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-7D (bg)	No	n/a	NP	9	248.5	259.2	ln(x)	ShapiroWilk

# Outlier Analysis - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 7/16/2019, 10:57 AM

Constituent	Well	Outlier	Value(s)	Method	N	Mean	Std. Dev.	Distribution	Normality Test
Calcium (mg/L)	MW-8D (bg)	No	n/a	NP	11	487	139	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-15	No	n/a	NP	12	84.28	21.28	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-3D	No	n/a	NP	12	138.7	23.13	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-6D	No	n/a	NP	8	203.5	31.18	x^6	ShapiroWilk
Calcium (mg/L)	MW-9D	No	n/a	NP	8	294.1	64.61	x^4	ShapiroWilk
Calcium (mg/L)	MW-4D	No	n/a	NP	10	186.6	12.99	normal	ShapiroWilk
Calcium (mg/L)	MW-12D	No	n/a	NP	10	102.6	36.57	ln(x)	ShapiroWilk
Calcium (mg/L)	MW-5D	No	n/a	NP	10	142.6	11.06	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-7D (bg)	No	n/a	NP	9	355.4	192.9	normal	ShapiroWilk
Chloride (mg/L)	MW-8D (bg)	No	n/a	NP	11	11986	1166	ln(x)	ShapiroWilk
<b>Chloride (mg/L)</b>	<b>MW-15</b>	<b>Yes</b>	<b>111</b>	<b>NP</b>	<b>12</b>	<b>32.25</b>	<b>30.12</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
<b>Chloride (mg/L)</b>	<b>MW-3D</b>	<b>Yes</b>	<b>23</b>	<b>NP</b>	<b>12</b>	<b>13.58</b>	<b>3.288</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Chloride (mg/L)	MW-6D	No	n/a	NP	8	30.25	1.389	sqrt(x)	ShapiroWilk
Chloride (mg/L)	MW-9D	No	n/a	NP	8	155.4	86.93	sqrt(x)	ShapiroWilk
Chloride (mg/L)	MW-4D	No	n/a	NP	10	27.83	6.996	ln(x)	ShapiroWilk
<b>Chloride (mg/L)</b>	<b>MW-12D</b>	<b>Yes</b>	<b>91</b>	<b>NP</b>	<b>10</b>	<b>25.5</b>	<b>23.15</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Chloride (mg/L)	MW-5D	No	n/a	NP	9	27.06	2.981	ln(x)	ShapiroWilk
Chromium (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.02955	0.04483	ln(x)	ShapiroWilk
Chromium (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.004962	0.005615	ln(x)	ShapiroWilk
Chromium (mg/L)	MW-15	No	n/a	NP	12	0.002332	0.002352	x^(1/3)	ShapiroWilk
Chromium (mg/L)	MW-3D	No	n/a	NP	12	0.003558	0.004924	ln(x)	ShapiroWilk
Chromium (mg/L)	MW-6D	No	n/a	NP	8	0.005719	0.002302	x^3	ShapiroWilk
Chromium (mg/L)	MW-9D	No	n/a	NP	8	0.01027	0.00617	normal	ShapiroWilk
Chromium (mg/L)	MW-4D	No	n/a	NP	9	0.003866	0.008012	ln(x)	ShapiroWilk
Chromium (mg/L)	MW-12D	No	n/a	NP	9	0.002139	0.00232	ln(x)	ShapiroWilk
Chromium (mg/L)	MW-5D	No	n/a	NP	9	0.0006623	0.0003552	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.01029	0.0148	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.004142	0.002704	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-15	No	n/a	NP	12	0.001621	0.001068	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-3D	No	n/a	NP	12	0.002067	0.001262	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-6D	No	n/a	NP	8	0.003014	0.0009294	x^4	ShapiroWilk
Cobalt (mg/L)	MW-9D	No	n/a	NP	8	0.008858	0.003339	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-4D	No	n/a	NP	9	0.001265	0.000775	ln(x)	ShapiroWilk
Cobalt (mg/L)	MW-12D	No	n/a	NP	9	0.001624	0.0009752	x^(1/3)	ShapiroWilk
Cobalt (mg/L)	MW-5D	No	n/a	NP	9	0.0008123	0.0007372	ln(x)	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-7D (bg)	No	n/a	NP	8	3.108	0.5949	normal	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-8D (bg)	No	n/a	NP	8	6.303	1.601	ln(x)	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-15	No	n/a	NP	12	0.9451	0.3271	ln(x)	ShapiroWilk
<b>Combined Radium 226 + 228 (pCi/L)</b>	<b>MW-3D</b>	<b>Yes</b>	<b>14.28</b>	<b>NP</b>	<b>12</b>	<b>2.982</b>	<b>3.592</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Combined Radium 226 + 228 (pCi/L)	MW-6D	No	n/a	NP	8	1.457	0.3437	ln(x)	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-4D	No	n/a	NP	8	1.985	1.003	ln(x)	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-12D	No	n/a	NP	8	2.185	1.329	ln(x)	ShapiroWilk
Combined Radium 226 + 228 (pCi/L)	MW-5D	No	n/a	NP	8	3.335	1.201	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-7D (bg)	No	n/a	NP	9	1.818	0.8399	normal	ShapiroWilk
Fluoride (mg/L)	MW-8D (bg)	n/a	n/a	NP	11	0.9309	0.2291	unknown	ShapiroWilk
Fluoride (mg/L)	MW-15	No	n/a	NP	12	1.779	0.3789	x^6	ShapiroWilk
Fluoride (mg/L)	MW-3D	No	n/a	NP	12	0.9024	0.1244	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-6D	No	n/a	NP	8	0.7895	0.1518	x^(1/3)	ShapiroWilk
Fluoride (mg/L)	MW-9D	No	n/a	NP	8	0.9776	0.5368	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-4D	No	n/a	NP	10	0.8125	0.3025	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-12D	No	n/a	NP	10	2.407	0.3782	ln(x)	ShapiroWilk
Fluoride (mg/L)	MW-5D	No	n/a	NP	9	0.6811	0.2004	x^5	ShapiroWilk
Lead (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.01325	0.02176	ln(x)	ShapiroWilk
Lead (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.003685	0.001825	sqrt(x)	ShapiroWilk
Lead (mg/L)	MW-15	No	n/a	NP	12	0.003753	0.001635	ln(x)	ShapiroWilk



# Outlier Analysis - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 7/16/2019, 10:57 AM

Constituent	Well	Outlier	Value(s)	Method	N	Mean	Std. Dev.	Distribution	Normality Test
Lead (mg/L)	MW-3D	No	n/a	NP	12	0.003701	0.001753	normal	ShapiroWilk
Lead (mg/L)	MW-6D	No	n/a	NP	8	0.003195	0.001395	normal	ShapiroWilk
Lead (mg/L)	MW-9D	No	n/a	NP	8	0.005931	0.00316	normal	ShapiroWilk
Lead (mg/L)	MW-4D	No	n/a	NP	9	0.00219	0.002153	ln(x)	ShapiroWilk
Lead (mg/L)	MW-12D	No	n/a	NP	9	0.004514	0.001425	normal	ShapiroWilk
Lead (mg/L)	MW-5D	No	n/a	NP	9	0.001748	0.001873	ln(x)	ShapiroWilk
Lithium (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.1411	0.03981	ln(x)	ShapiroWilk
Lithium (mg/L)	MW-8D (bg)	No	n/a	NP	11	1.189	0.1091	ln(x)	ShapiroWilk
Lithium (mg/L)	MW-15	No	n/a	NP	12	0.008383	0.001941	ln(x)	ShapiroWilk
Lithium (mg/L)	MW-3D	No	n/a	NP	12	0.01577	0.001757	ln(x)	ShapiroWilk
Lithium (mg/L)	MW-6D	No	n/a	NP	8	0.01911	0.00291	x^3	ShapiroWilk
Lithium (mg/L)	MW-9D	No	n/a	NP	8	0.02532	0.005668	sqrt(x)	ShapiroWilk
Lithium (mg/L)	MW-4D	No	n/a	NP	8	0.00371	0.0009187	ln(x)	ShapiroWilk
Lithium (mg/L)	MW-12D	No	n/a	NP	8	0.005234	0.001653	ln(x)	ShapiroWilk
Lithium (mg/L)	MW-5D	No	n/a	NP	8	0.01141	0.0009013	x^6	ShapiroWilk
Mercury (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.00002167	0.00001428	ln(x)	ShapiroWilk
Mercury (mg/L)	MW-8D (bg)	n/a	n/a	NP	11	0.00002091	0.000007273	unknown	ShapiroWilk
Mercury (mg/L)	MW-15	n/a	n/a	NP	12	0.00001892	0.00000664	unknown	ShapiroWilk
Mercury (mg/L)	MW-3D	No	n/a	NP	12	0.00002125	0.000006904	ln(x)	ShapiroWilk
Mercury (mg/L)	MW-6D	No	n/a	NP	8	0.00001825	0.000007611	ln(x)	ShapiroWilk
Mercury (mg/L)	MW-9D	No	n/a	NP	8	0.00001675	0.000005776	ln(x)	ShapiroWilk
Mercury (mg/L)	MW-4D	n/a	n/a	NP	9	0.000023	0.000006	unknown	ShapiroWilk
Mercury (mg/L)	MW-12D	No	n/a	NP	9	0.00001822	0.000008273	ln(x)	ShapiroWilk
Mercury (mg/L)	MW-5D	n/a	n/a	NP	9	0.00002289	0.000006333	unknown	ShapiroWilk
Molybdenum (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.03396	0.01079	ln(x)	ShapiroWilk
Molybdenum (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.002343	0.001018	x^(1/3)	ShapiroWilk
Molybdenum (mg/L)	MW-15	No	n/a	NP	12	0.6351	0.03228	x^6	ShapiroWilk
<b>Molybdenum (mg/L)</b>	<b>MW-3D</b>	<b>Yes</b>	<b>0.07928</b>	<b>NP</b>	<b>12</b>	<b>0.009283</b>	<b>0.02205</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Molybdenum (mg/L)	MW-6D	No	n/a	NP	8	0.06722	0.02812	x^6	ShapiroWilk
Molybdenum (mg/L)	MW-9D	No	n/a	NP	8	0.1189	0.03949	ln(x)	ShapiroWilk
Molybdenum (mg/L)	MW-4D	No	n/a	NP	8	0.005206	0.001419	ln(x)	ShapiroWilk
Molybdenum (mg/L)	MW-12D	No	n/a	NP	8	0.7578	0.0783	x^2	ShapiroWilk
Molybdenum (mg/L)	MW-5D	No	n/a	NP	8	0.001305	0.0006926	normal	ShapiroWilk
pH, field (SU)	MW-7D (bg)	No	n/a	NP	9	7.324	0.4731	ln(x)	ShapiroWilk
pH, field (SU)	MW-8D (bg)	No	n/a	NP	9	7.071	0.1434	ln(x)	ShapiroWilk
pH, field (SU)	MW-15	No	n/a	NP	10	7.852	0.5446	x^4	ShapiroWilk
pH, field (SU)	MW-3D	No	n/a	NP	10	7.101	0.3915	ln(x)	ShapiroWilk
pH, field (SU)	MW-6D	No	n/a	NP	8	7.153	0.4475	x^2	ShapiroWilk
pH, field (SU)	MW-9D	No	n/a	NP	8	7.256	0.1972	ln(x)	ShapiroWilk
pH, field (SU)	MW-4D	No	n/a	NP	10	7.675	0.3629	x^6	ShapiroWilk
pH, field (SU)	MW-12D	No	n/a	NP	10	8.459	0.6611	x^2	ShapiroWilk
pH, field (SU)	MW-5D	No	n/a	NP	10	7.853	0.3525	x^6	ShapiroWilk
Selenium (mg/L)	MW-7D (bg)	No	n/a	NP	9	0.009326	0.008021	ln(x)	ShapiroWilk
Selenium (mg/L)	MW-8D (bg)	No	n/a	NP	11	0.004629	0.001428	x^2	ShapiroWilk
Selenium (mg/L)	MW-15	No	n/a	NP	12	0.007312	0.005647	ln(x)	ShapiroWilk
Selenium (mg/L)	MW-3D	n/a	n/a	NP	12	0.004667	0.001155	unknown	ShapiroWilk
Selenium (mg/L)	MW-6D	n/a	n/a	NP	8	0.005	0	unknown	ShapiroWilk
Selenium (mg/L)	MW-9D	No	n/a	NP	8	0.003499	0.001205	normal	ShapiroWilk
Selenium (mg/L)	MW-4D	No	n/a	NP	9	0.002356	0.002509	ln(x)	ShapiroWilk
Selenium (mg/L)	MW-12D	No	n/a	NP	9	0.003237	0.001328	normal	ShapiroWilk
Selenium (mg/L)	MW-5D	No	n/a	NP	9	0.002006	0.00227	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-7D (bg)	No	n/a	NP	9	881.6	419.4	normal	ShapiroWilk
Sulfate (mg/L)	MW-8D (bg)	No	n/a	NP	11	109.6	24.76	x^3	ShapiroWilk
Sulfate (mg/L)	MW-15	No	n/a	NP	12	578.6	31.72	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-3D	No	n/a	NP	12	205.9	20.34	x^6	ShapiroWilk

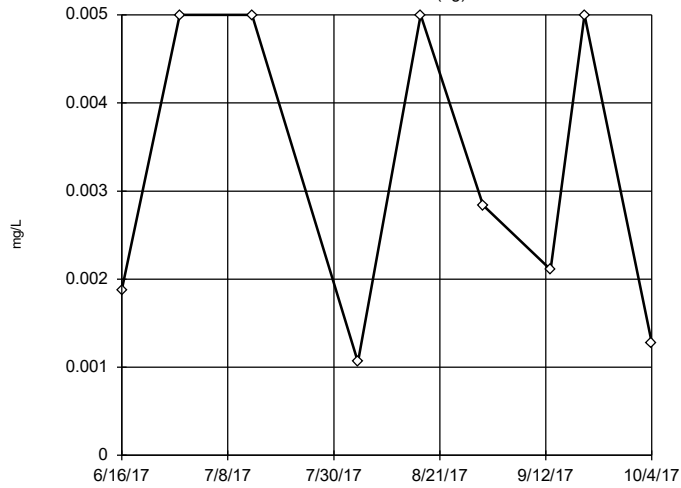
# Outlier Analysis - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 7/16/2019, 10:57 AM

Constituent	Well	Outlier	Value(s)	Method	N	Mean	Std. Dev.	Distribution	Normality Test
Sulfate (mg/L)	MW-6D	No	n/a	NP	8	515.6	10.41	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-9D	No	n/a	NP	8	1079	170.3	x^6	ShapiroWilk
Sulfate (mg/L)	MW-4D	No	n/a	NP	10	296.4	50.08	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-12D	No	n/a	NP	10	559.8	60.94	x^2	ShapiroWilk
<b>Sulfate (mg/L)</b>	<b>MW-5D</b>	<b>Yes</b>	<b>662</b>	<b>NP</b>	<b>9</b>	<b>189.4</b>	<b>177.5</b>	<b>ln(x)</b>	<b>ShapiroWilk</b>
Thallium (mg/L)	MW-7D (bg)	n/a	n/a	NP	9	0.001	0	unknown	ShapiroWilk
Thallium (mg/L)	MW-8D (bg)	n/a	n/a	NP	11	0.001	0	unknown	ShapiroWilk
Thallium (mg/L)	MW-15	n/a	n/a	NP	12	0.001004	0.00001443	unknown	ShapiroWilk
Thallium (mg/L)	MW-3D	n/a	n/a	NP	12	0.001002	0.000005773	unknown	ShapiroWilk
Thallium (mg/L)	MW-6D	n/a	n/a	NP	8	0.001	0	unknown	ShapiroWilk
Thallium (mg/L)	MW-9D	n/a	n/a	NP	8	0.001	0	unknown	ShapiroWilk
Thallium (mg/L)	MW-4D	No	n/a	NP	9	0.001234	0.00106	sqrt(x)	ShapiroWilk
Thallium (mg/L)	MW-12D	No	n/a	NP	9	0.000893	0.0007764	ln(x)	ShapiroWilk
Thallium (mg/L)	MW-5D	No	n/a	NP	9	0.0009233	0.0006012	normal	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-7D (bg)	No	n/a	NP	9	2690	764.7	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-8D (bg)	No	n/a	NP	11	21432	1259	x^4	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-15	No	n/a	NP	12	1079	32.67	x^6	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-3D	No	n/a	NP	12	709	64.4	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-6D	No	n/a	NP	8	1037	46.63	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-9D	No	n/a	NP	8	2122	561.5	x^3	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-4D	No	n/a	NP	9	896.4	50.69	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-12D	No	n/a	NP	9	1067	32.79	ln(x)	ShapiroWilk
Total Dissolved Solids [TDS] (mg/L)	MW-5D	No	n/a	NP	8	638.8	16.28	ln(x)	ShapiroWilk

### Tukey's Outlier Screening

MW-7D (bg)

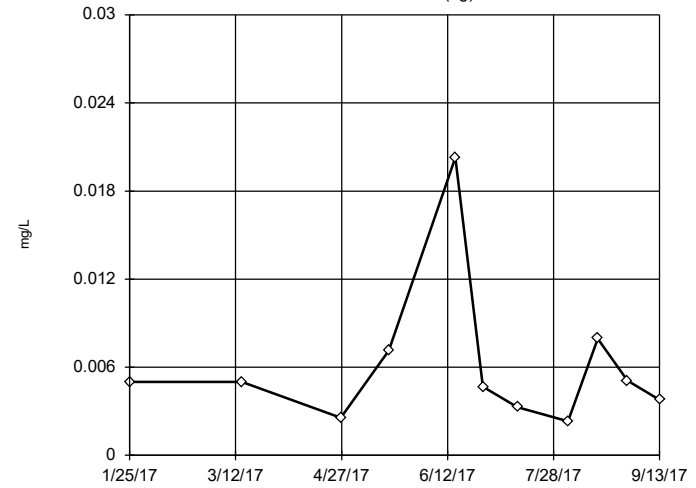


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.1674,  
 low cutoff = 0.00004633,  
 based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

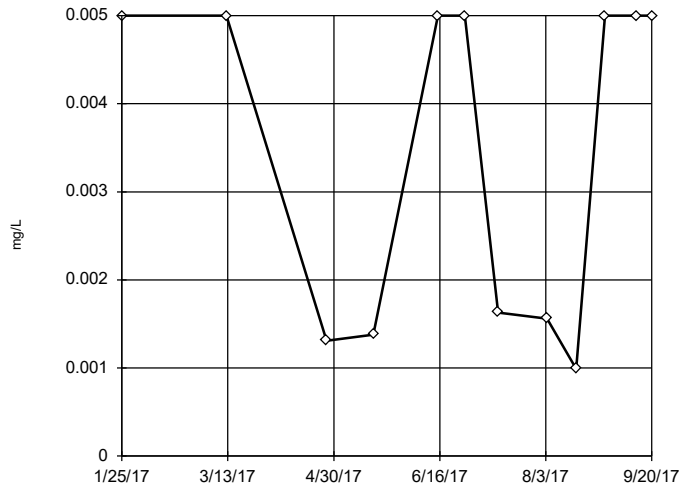


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.07324,  
 low cutoff = 0.0003193,  
 based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

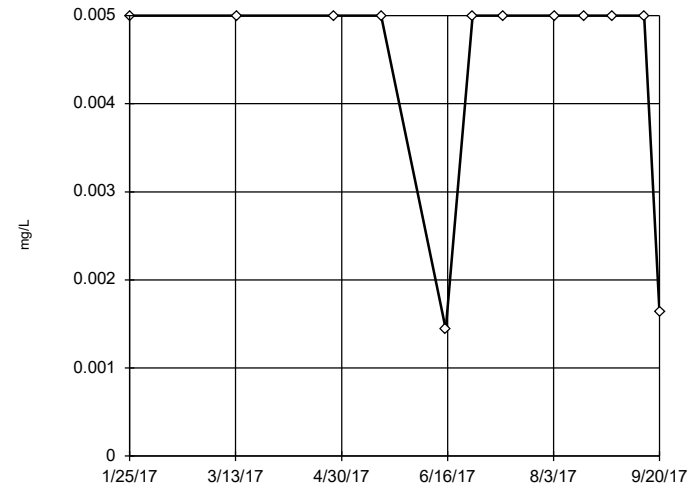


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.1979,  
 low cutoff = 0.00003708,  
 based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

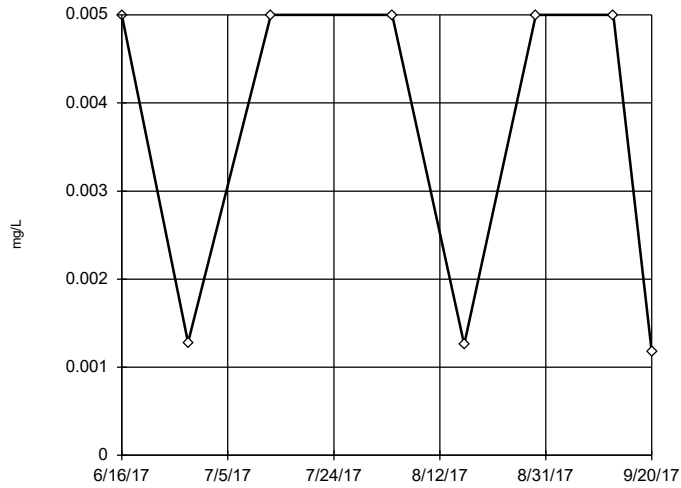


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

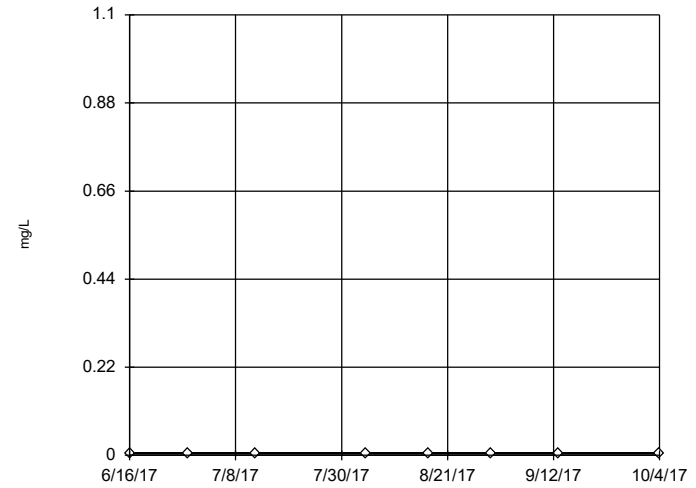


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.3051, low cutoff = 0.00002081, based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D

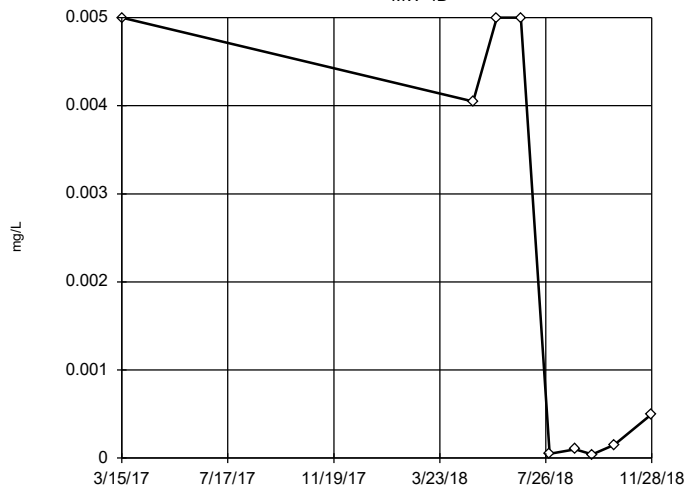


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D

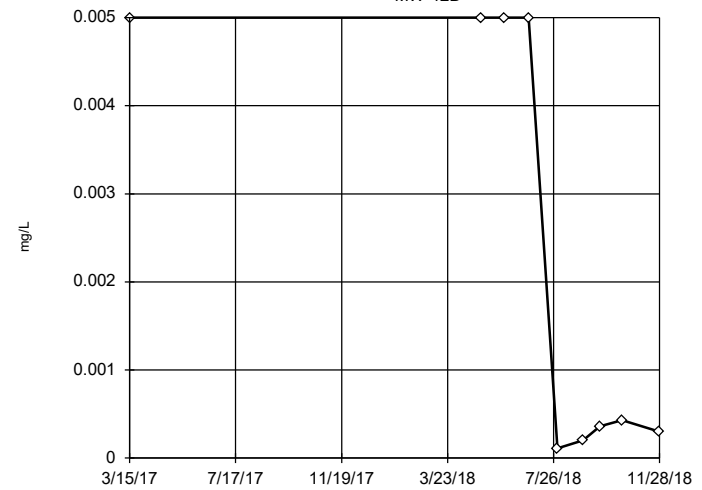


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1768, low cutoff = 2.0e-10, based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-12D

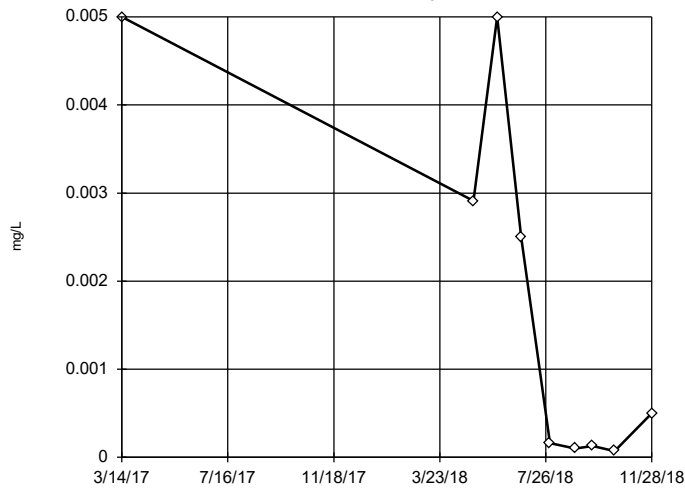


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 42.53, low cutoff = 2.9e-8, based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-5D

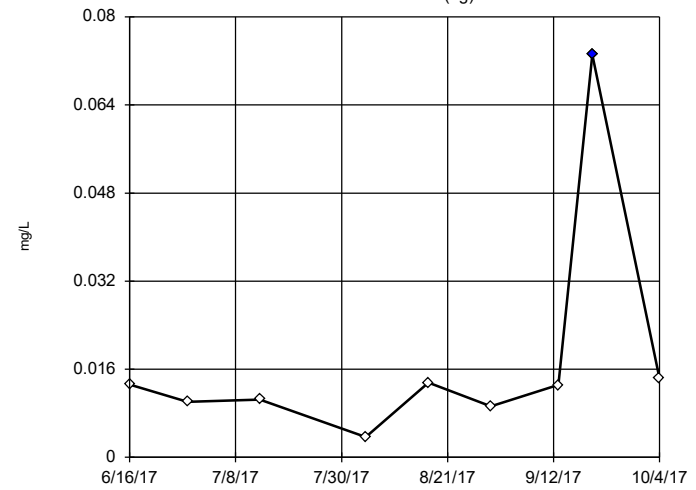


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 142.8, low cutoff = 3.0e-9, based on IQR multiplier of 3.

Constituent: Antimony Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-7D (bg)

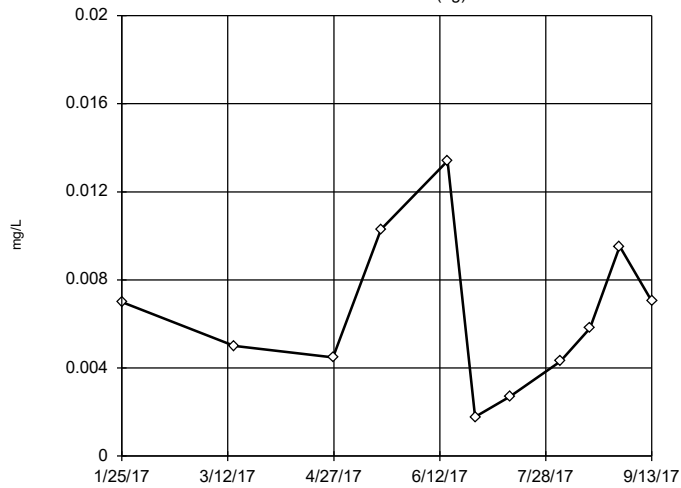


n = 9  
 Outlier is drawn as solid. Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0415, low cutoff = 0.003244, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

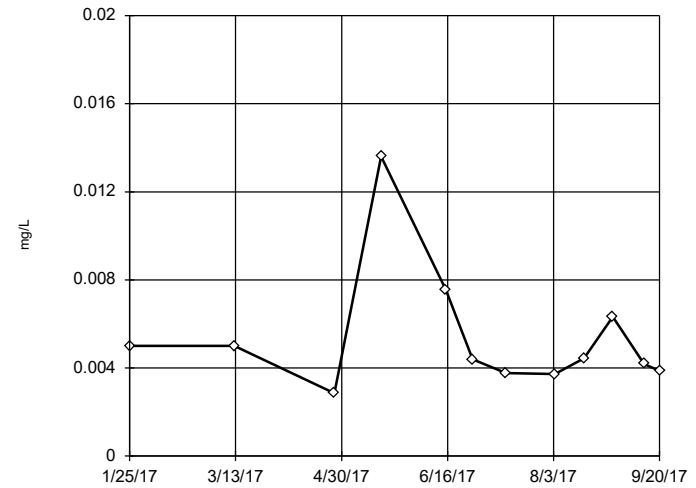


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.04662, low cutoff = 0.000003134, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

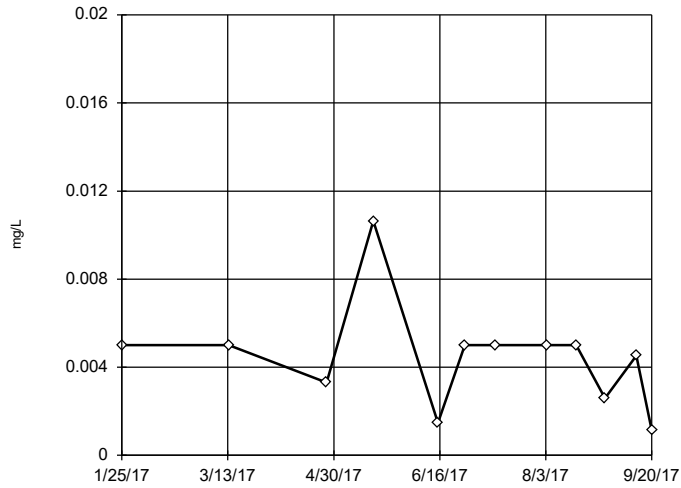
MW-15



n = 12  
 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 = 0.01792, low cutoff = 0.001198, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:43 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

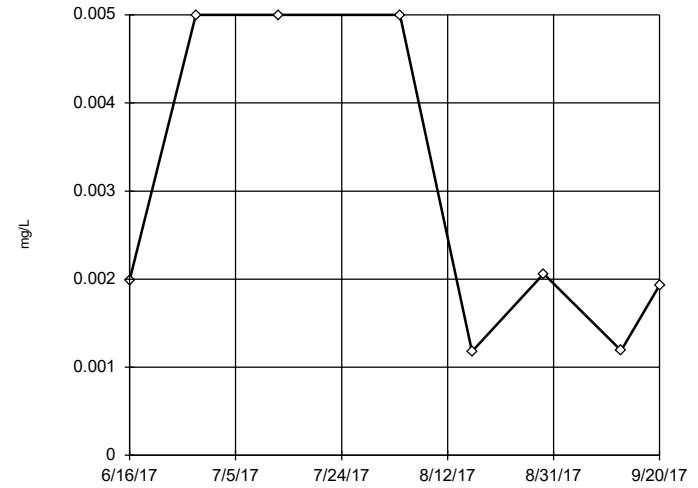
### Tukey's Outlier Screening MW-3D



n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.01647,  
 low cutoff = 0.0002137,  
 based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

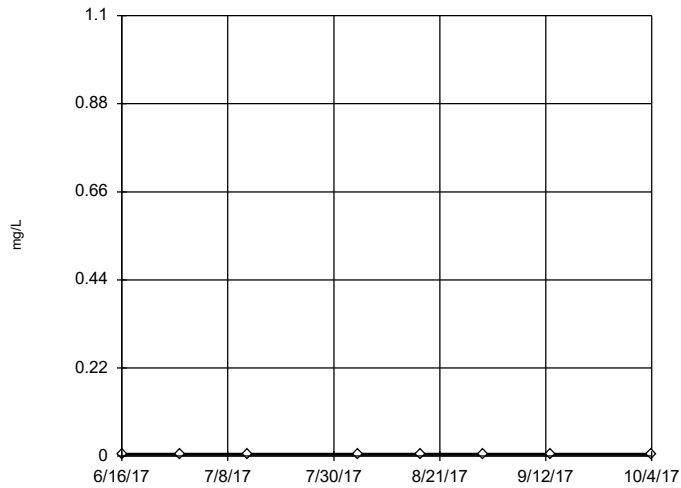
### Tukey's Outlier Screening MW-6D



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 = 0.1796,  
 low cutoff = 0.0000422,  
 based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

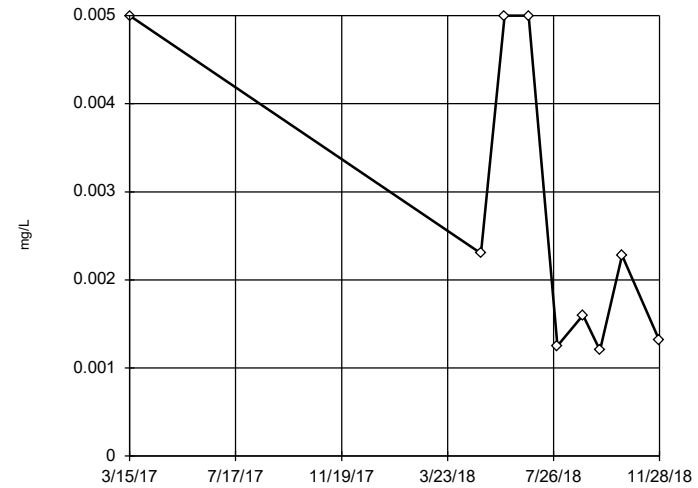
### Tukey's Outlier Screening MW-9D



n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Arsenic Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

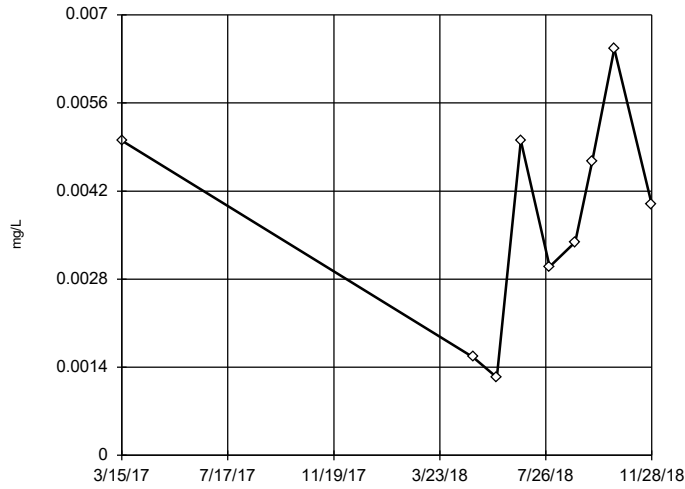
### Tukey's Outlier Screening MW-4D



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 = 0.2983,  
 low cutoff = 0.00002145,  
 based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

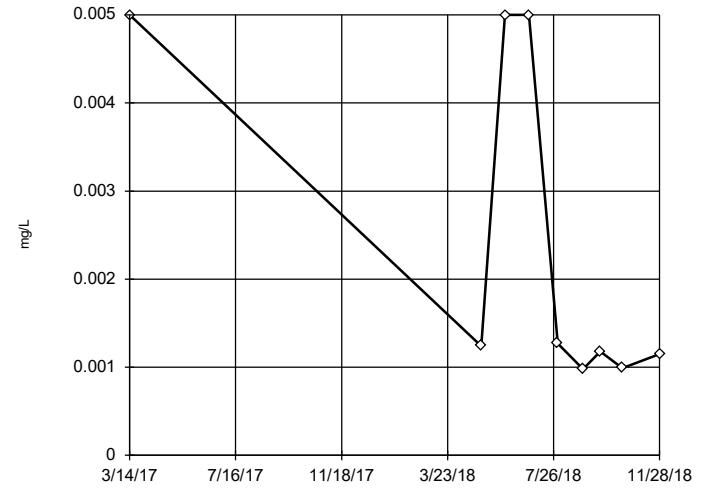
Tukey's Outlier Screening  
MW-12D



n = 9  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
High cutoff = 0.01316, low cutoff = -0.00588, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

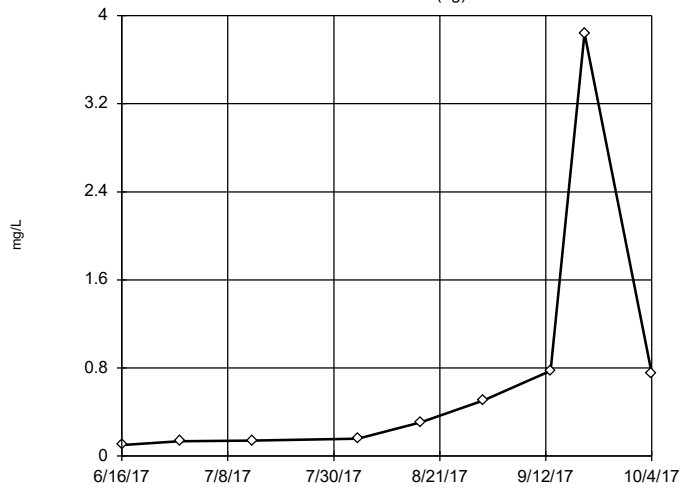
Tukey's Outlier Screening  
MW-5D



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 = 0.5145, low cutoff = 0.00001037, based on IQR multiplier of 3.

Constituent: Arsenic Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

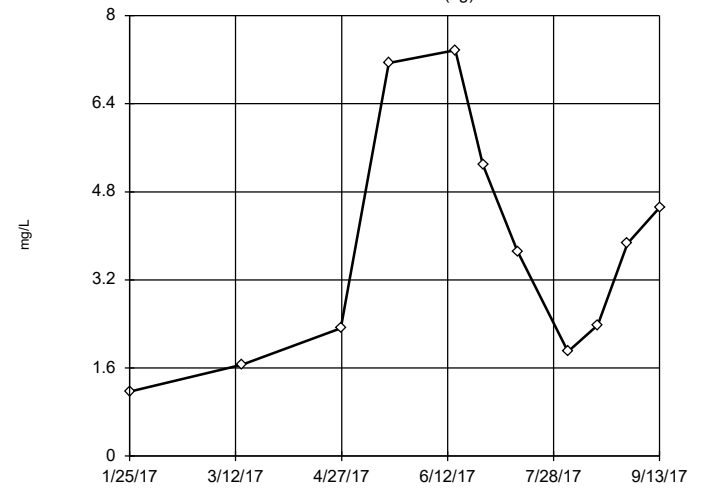
Tukey's Outlier Screening  
MW-7D (bg)



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 = 128.3, low cutoff = 0.0008196, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-8D (bg)

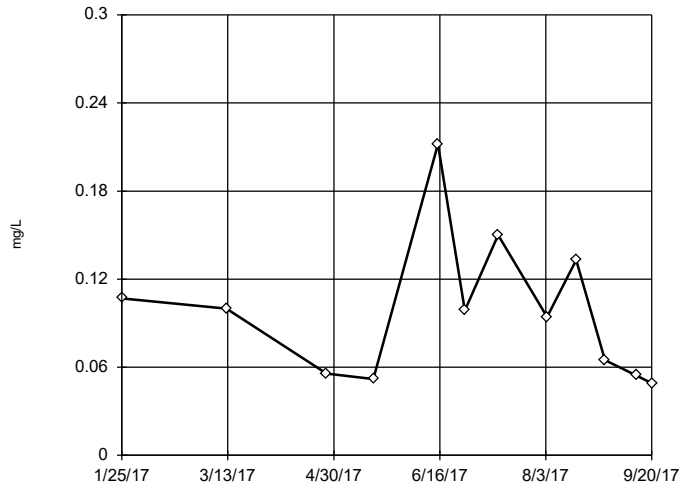


n = 11  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 114.2, low cutoff = 0.08803, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15



n = 12

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

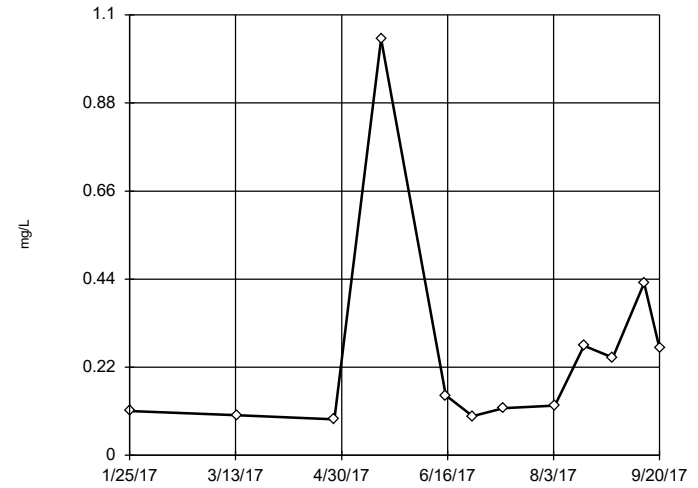
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1.215, low cutoff = 0.005402, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D



n = 12

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

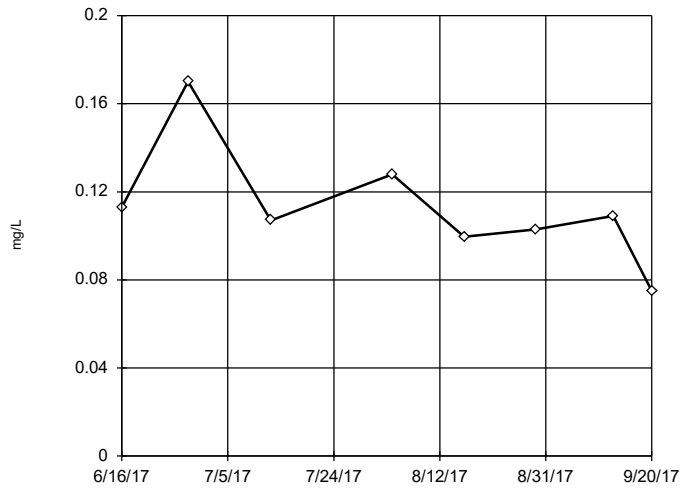
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 4.577, low cutoff = 0.006227, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D



n = 8

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

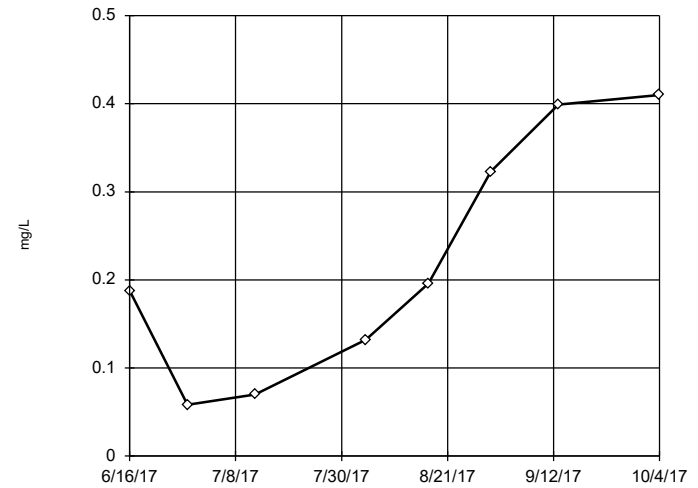
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.2015, low cutoff = 0.06043, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D



n = 8

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

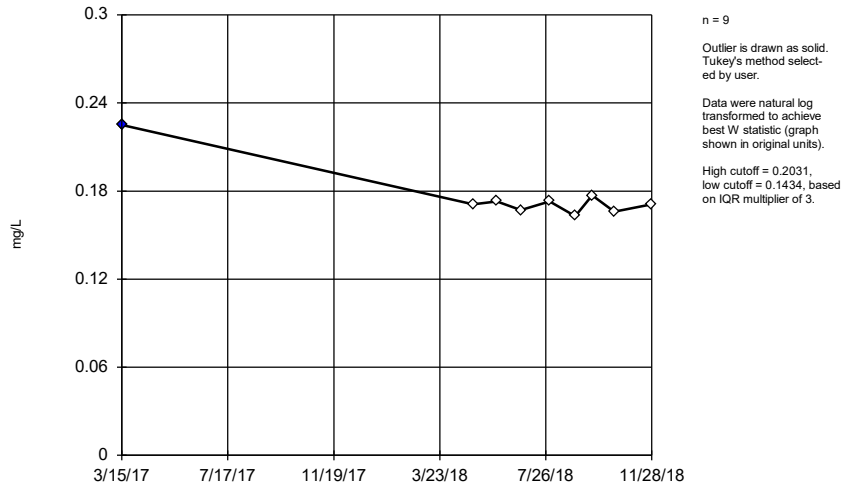
Data were cube root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 3.131, low cutoff = -0.02472, based on IQR multiplier of 3.

Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

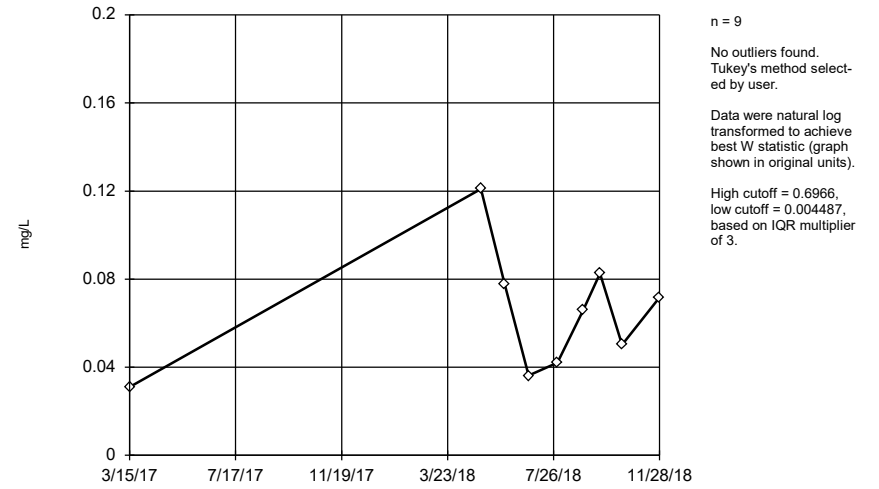


Tukey's Outlier Screening  
MW-4D



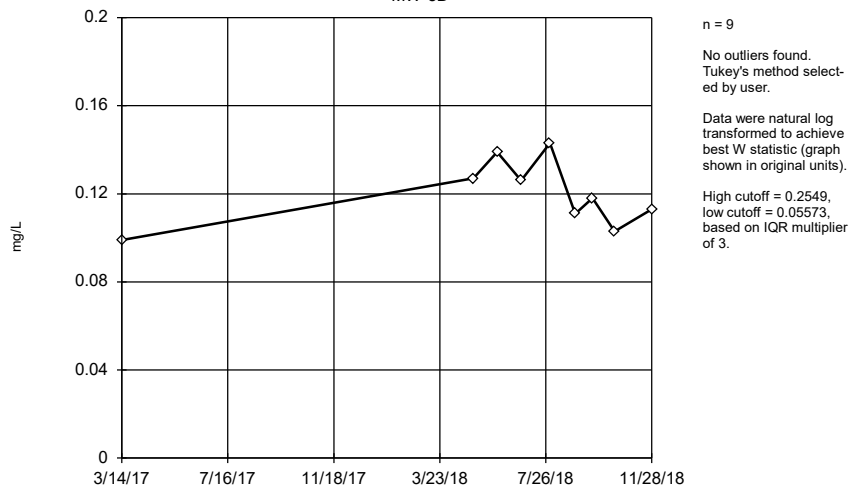
Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-12D



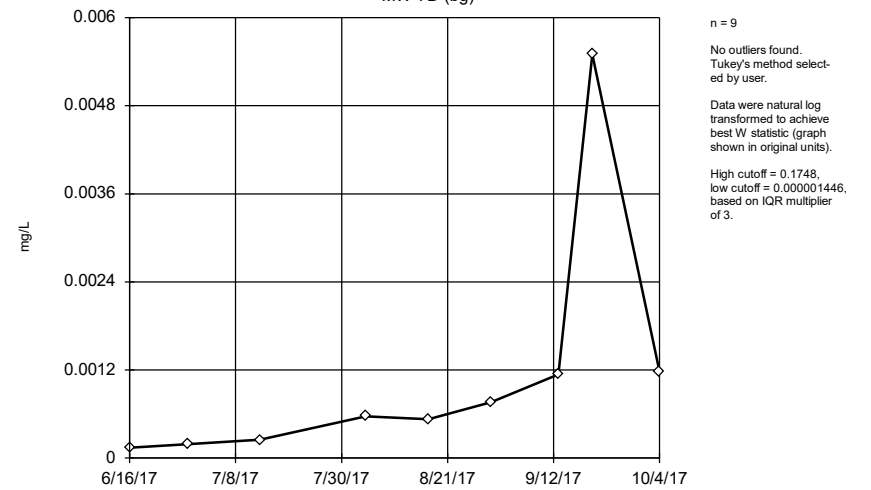
Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-5D



Constituent: Barium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

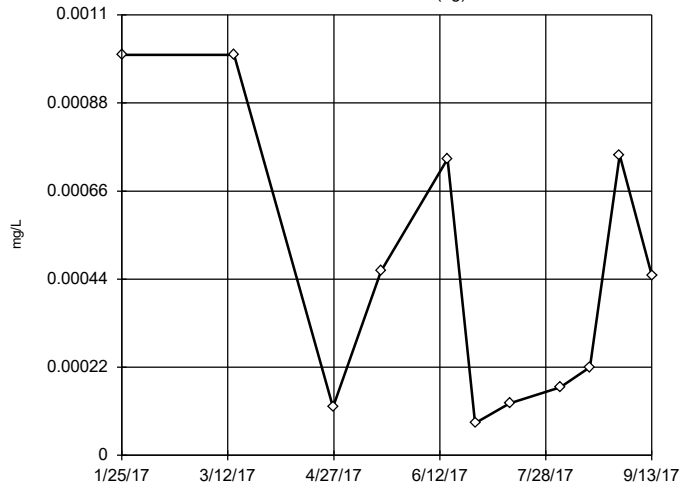
Tukey's Outlier Screening  
MW-7D (bg)



Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

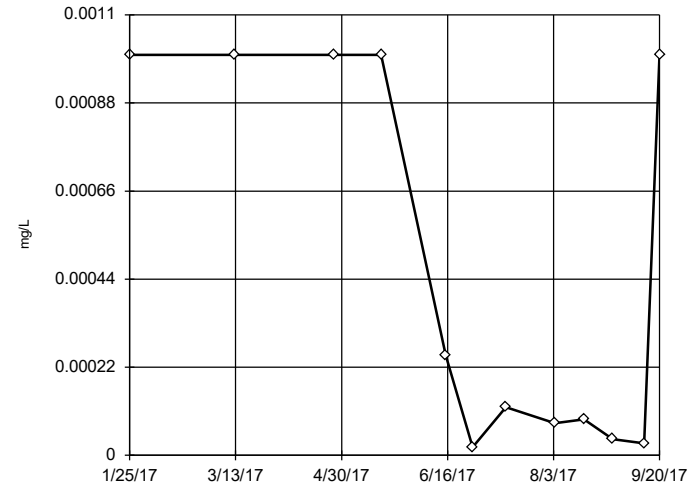


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.144, low cutoff = 6.8e-7, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

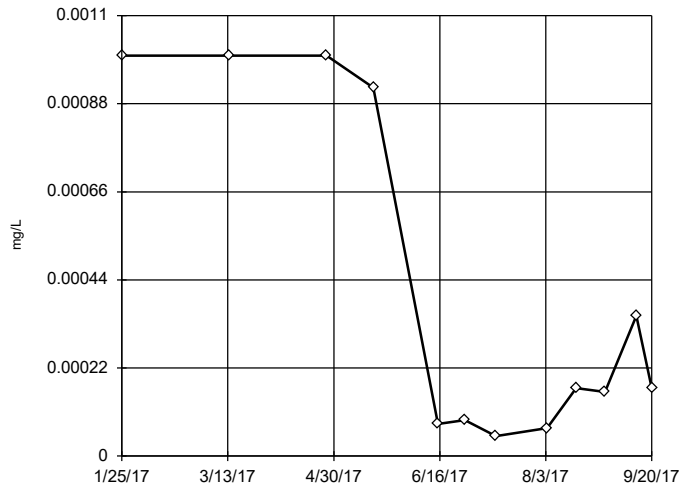


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 5.524, low cutoff = 1.0e-8, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

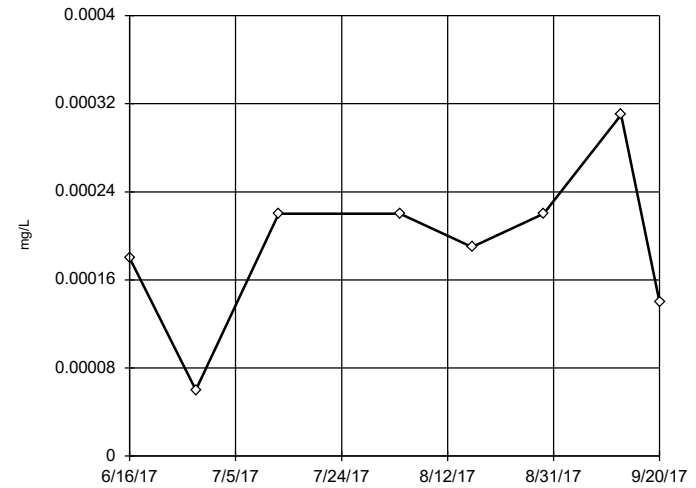


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.385, low cutoff = 5.9e-8, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

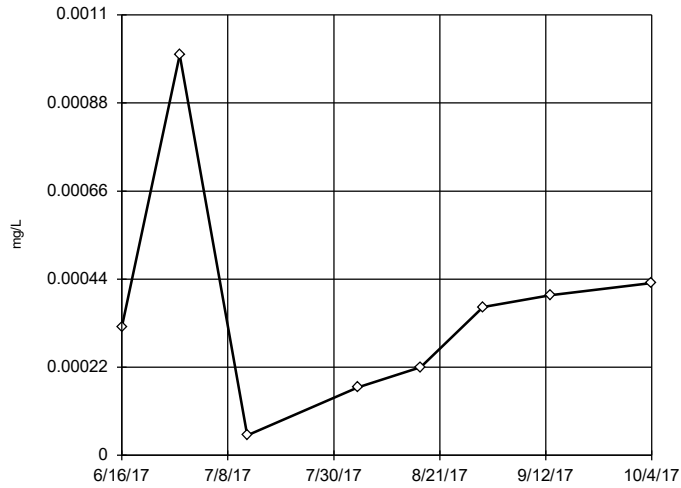
MW-6D



n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.0004, low cutoff = -0.00002, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

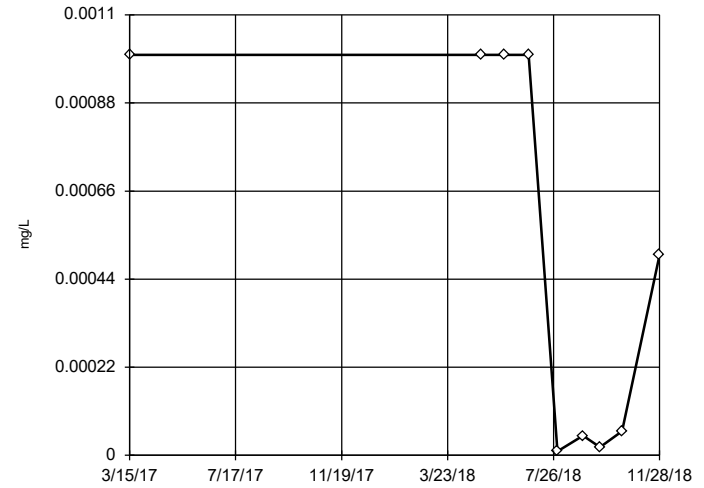
### Tukey's Outlier Screening MW-9D



n = 8  
No outliers found. Tukey's method selected by user.  
Data were cube root transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.001938, low cutoff = 4.7e-7, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

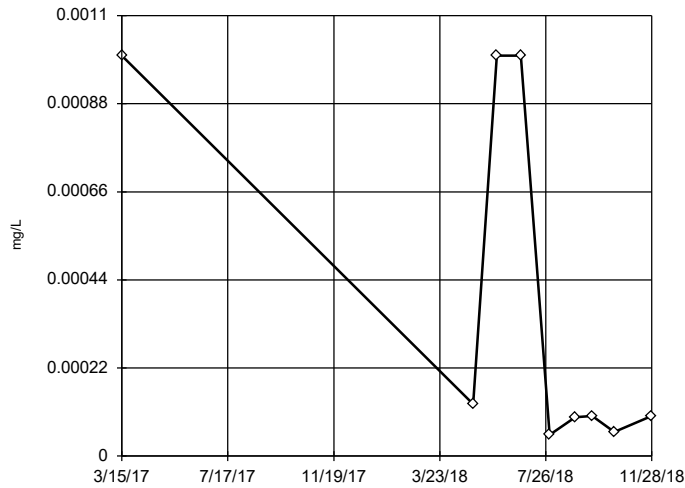
### Tukey's Outlier Screening MW-4D



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 = 32.6, low cutoff = 9.6e-10, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

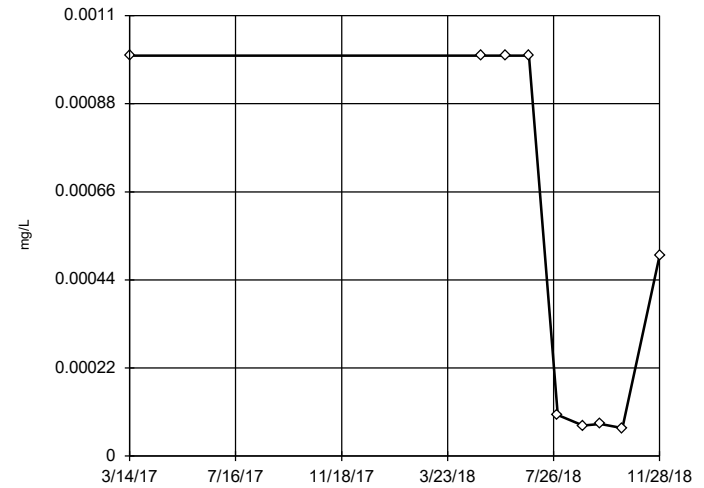
### Tukey's Outlier Screening MW-12D



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 = 2.252, low cutoff = 3.4e-8, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

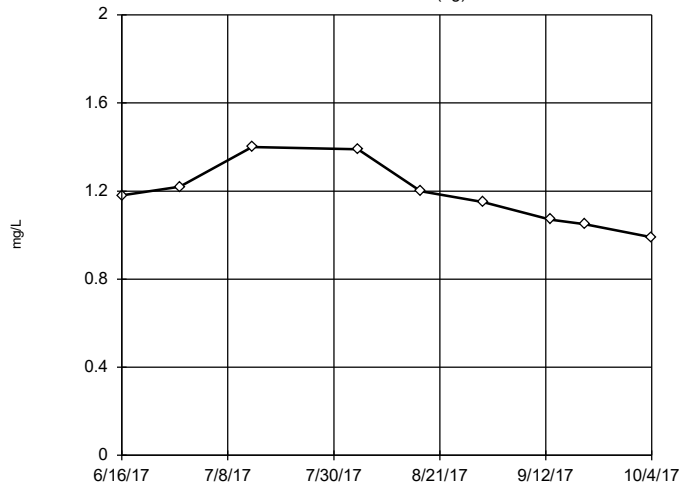
### Tukey's Outlier Screening MW-5D



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 = 2.109, low cutoff = 3.7e-8, based on IQR multiplier of 3.

Constituent: Beryllium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

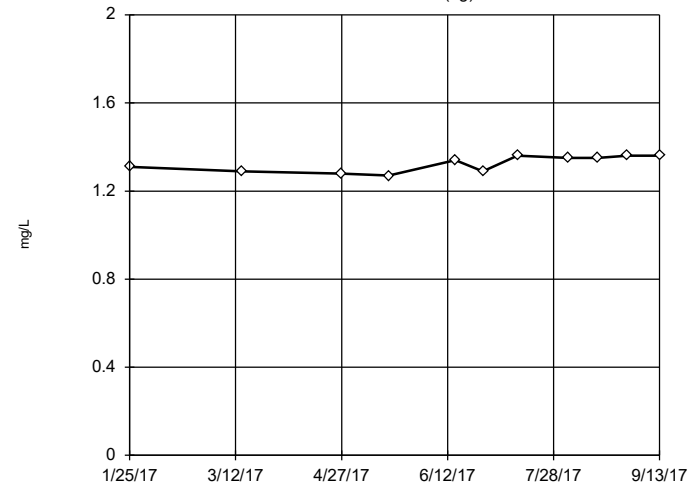
Tukey's Outlier Screening  
MW-7D (bg)



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 = 2.415, low cutoff = 0.5716, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

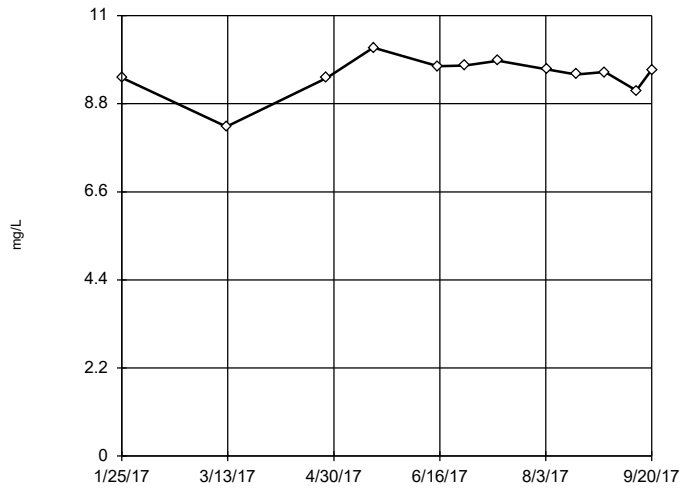
Tukey's Outlier Screening  
MW-8D (bg)



n = 11  
No outliers found. Tukey's method selected by user.  
Data were cube transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 1.536, low cutoff = 1.013, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

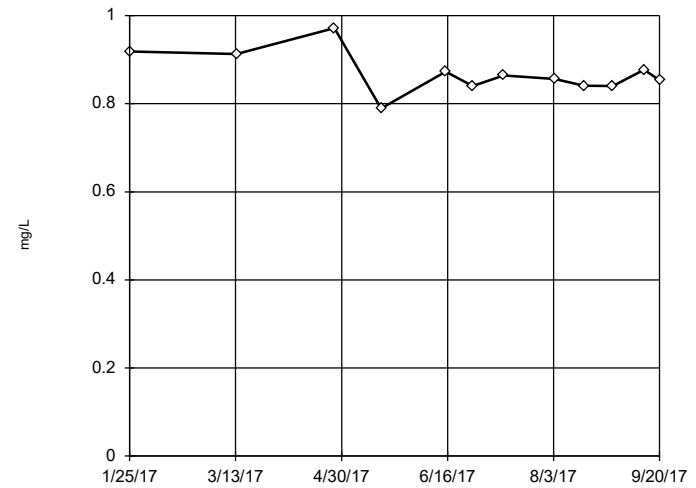
Tukey's Outlier Screening  
MW-15



n = 12  
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 = 10.44, low cutoff = 8.042, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-3D

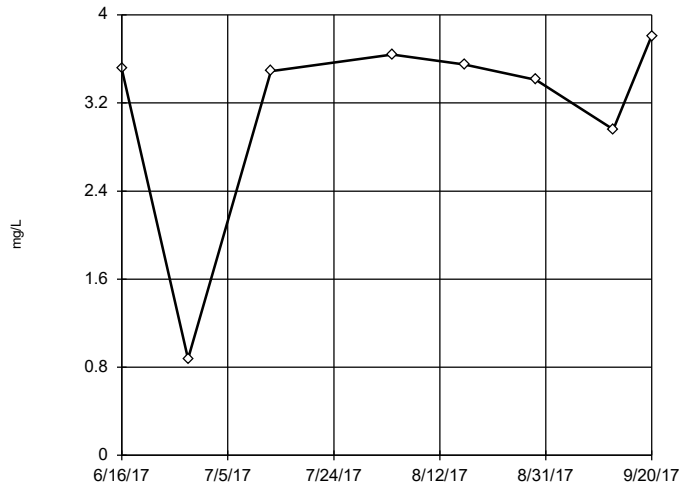


n = 12  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 1.08, low cutoff = 0.6965, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

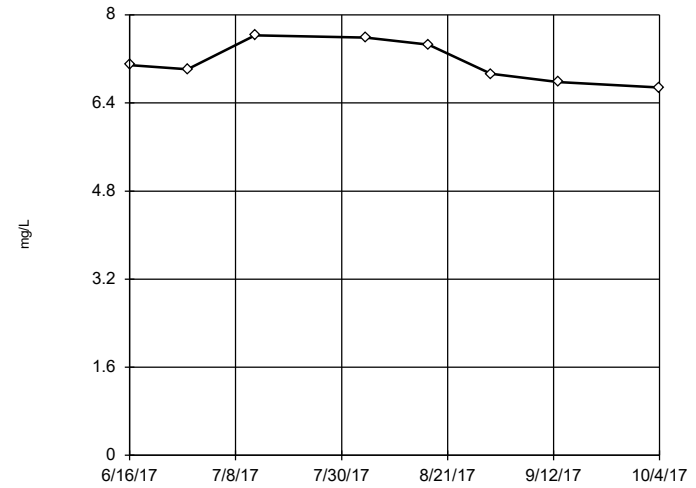


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*6 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 4.174, low cutoff = -3.55, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D

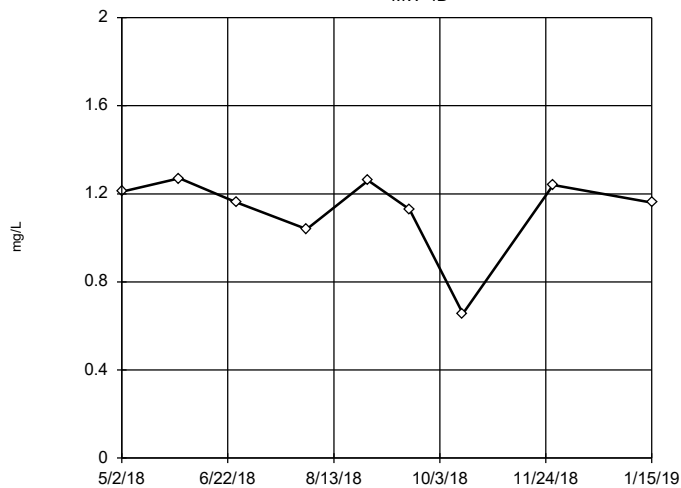


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 9.954, low cutoff = 5.181, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D

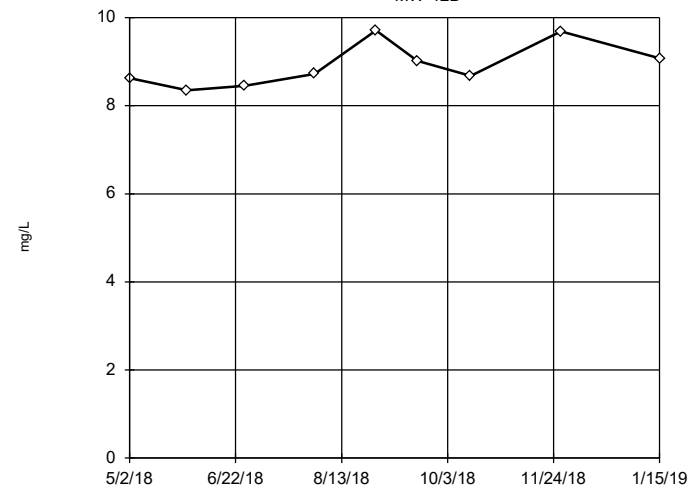


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*6 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.474, low cutoff = -1.297, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

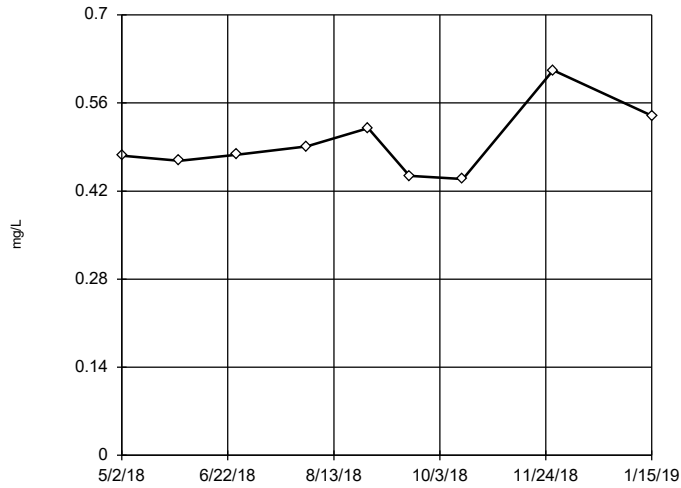
MW-12D



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 = 12.43, low cutoff = 6.443, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

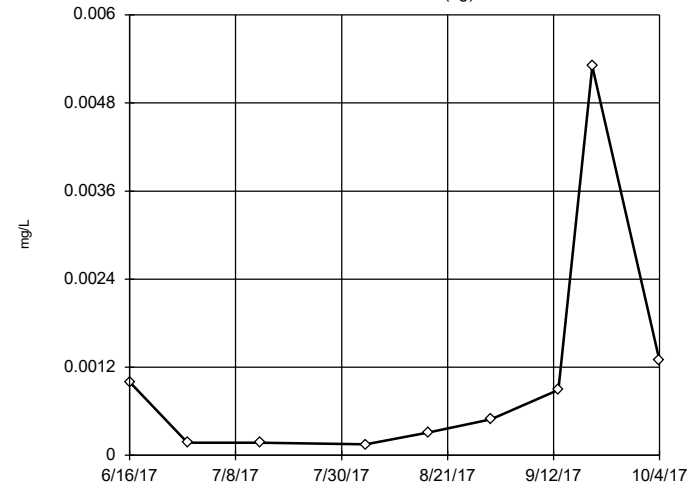
Tukey's Outlier Screening  
MW-5D



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 = 0.8324, low cutoff = 0.2902, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

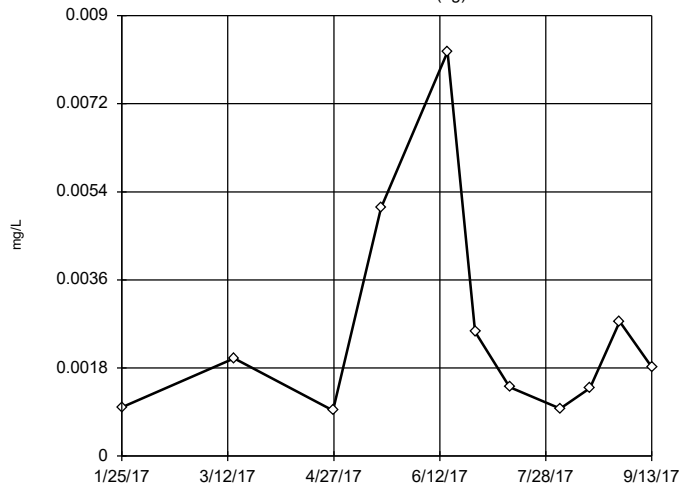
Tukey's Outlier Screening  
MW-7D (bg)



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 = 0.3387, low cutoff = 5.7e-7, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

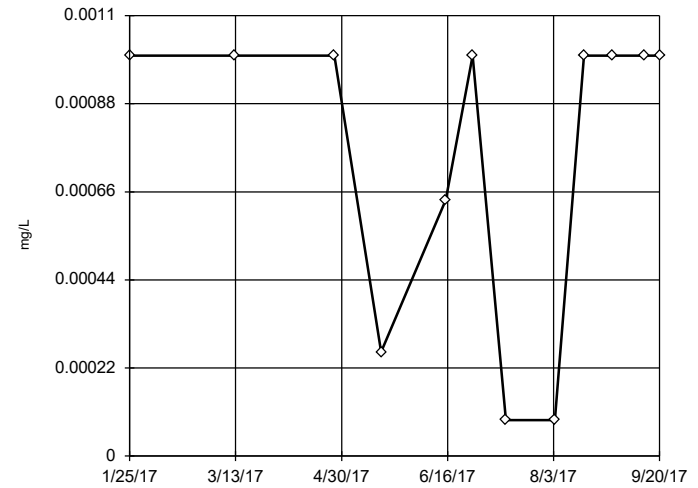
Tukey's Outlier Screening  
MW-8D (bg)



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 = 0.05719, low cutoff = 0.00004808, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

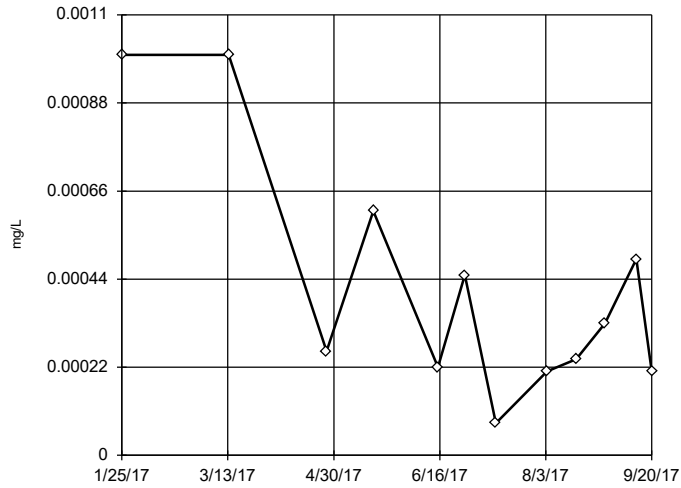
Tukey's Outlier Screening  
MW-15



n = 12  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
High cutoff = 0.00265, low cutoff = -0.0012, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

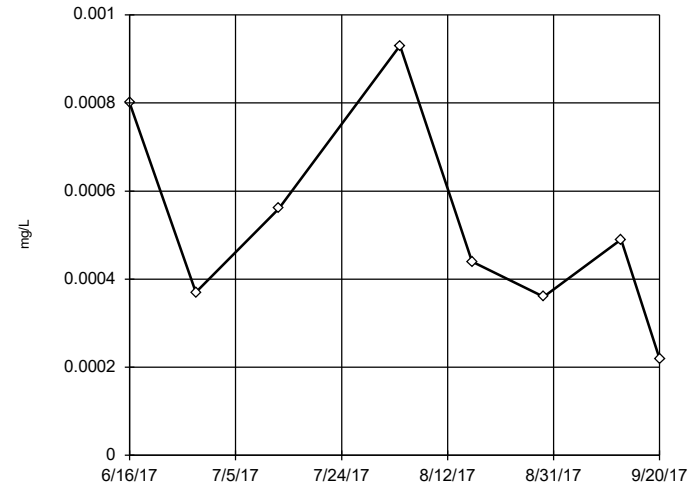
### Tukey's Outlier Screening MW-3D



n = 12  
 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 = 0.008997, low cutoff = 0.00001306, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

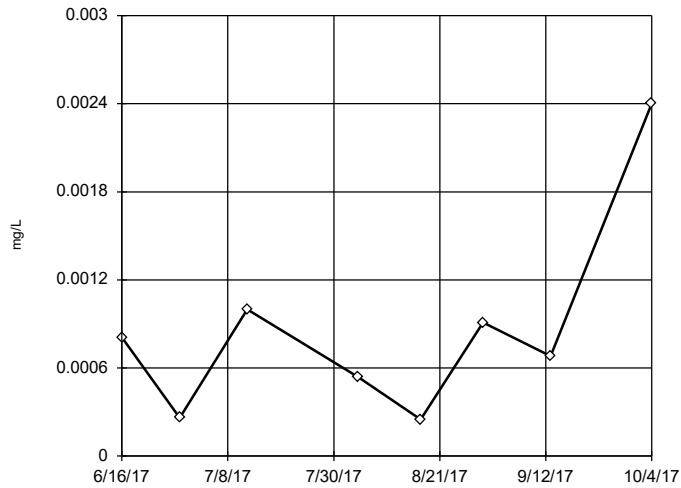
### Tukey's Outlier Screening MW-6D



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 = 0.004129, low cutoff = 0.00005917, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

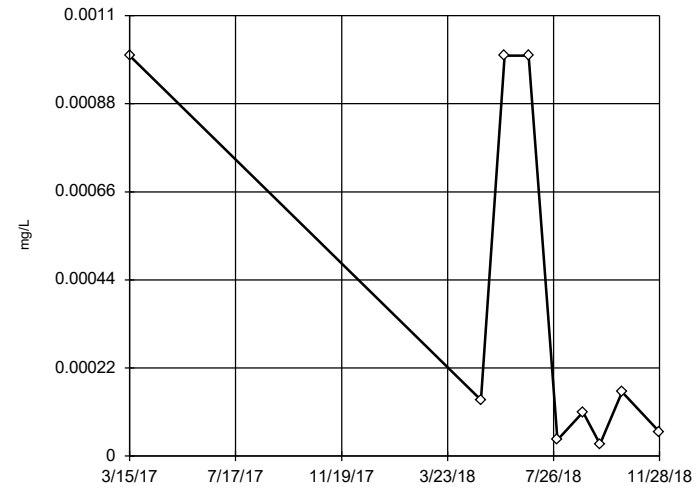
### Tukey's Outlier Screening MW-9D



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 = 0.01574, low cutoff = 0.00002271, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

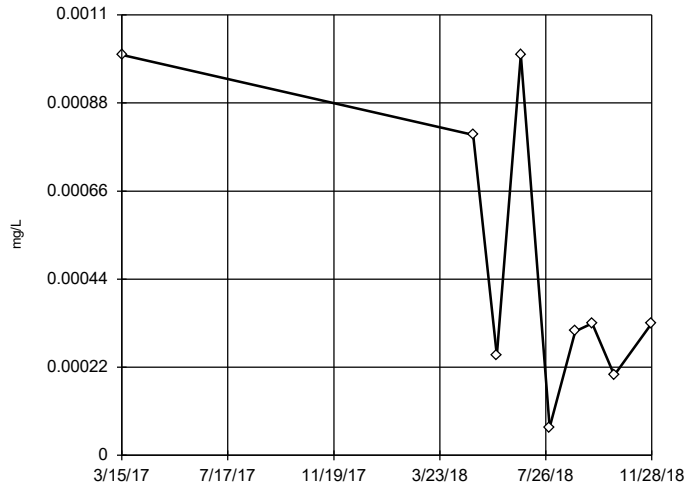
### Tukey's Outlier Screening MW-4D



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 = 8.505, low cutoff = 5.8e-9, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

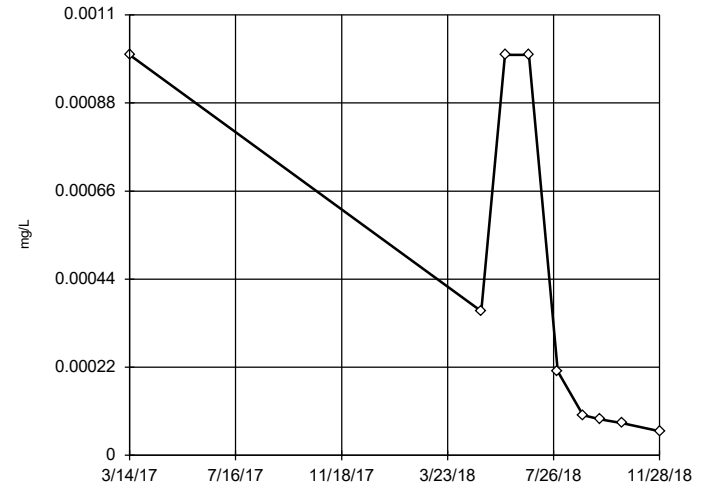
Tukey's Outlier Screening  
MW-12D



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 = 0.05724, low cutoff = 0.000003494, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

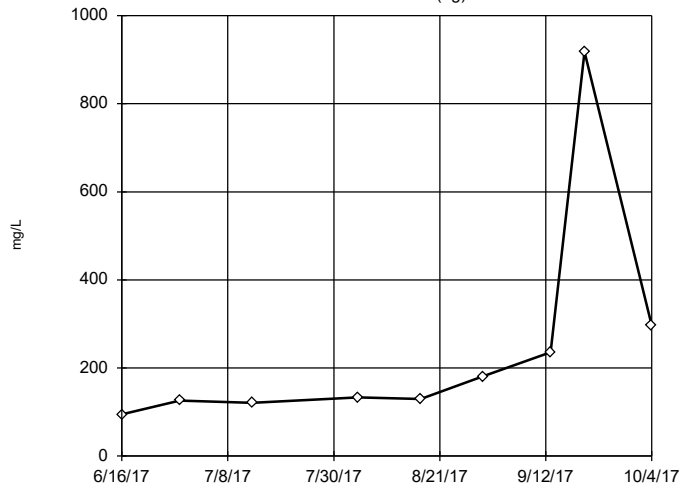
Tukey's Outlier Screening  
MW-5D



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 = 1.637, low cutoff = 5.2e-8, based on IQR multiplier of 3.

Constituent: Cadmium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

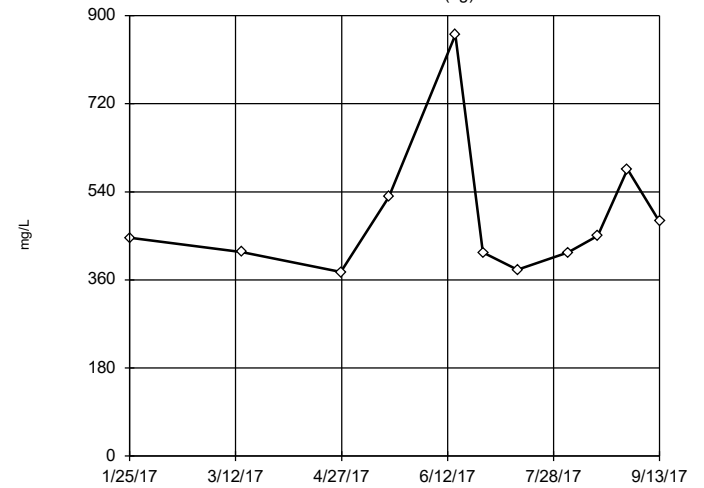
Tukey's Outlier Screening  
MW-7D (bg)



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 = 2610, low cutoff = 12.53, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-8D (bg)



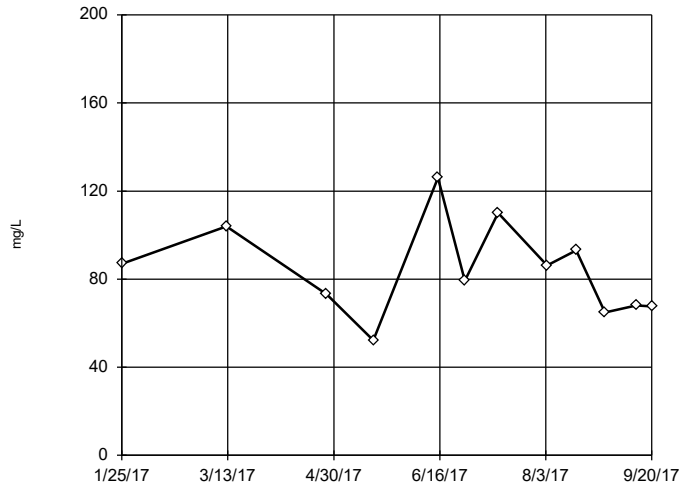
n = 11  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 1088, low cutoff = 202.3, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF



### Tukey's Outlier Screening

MW-15

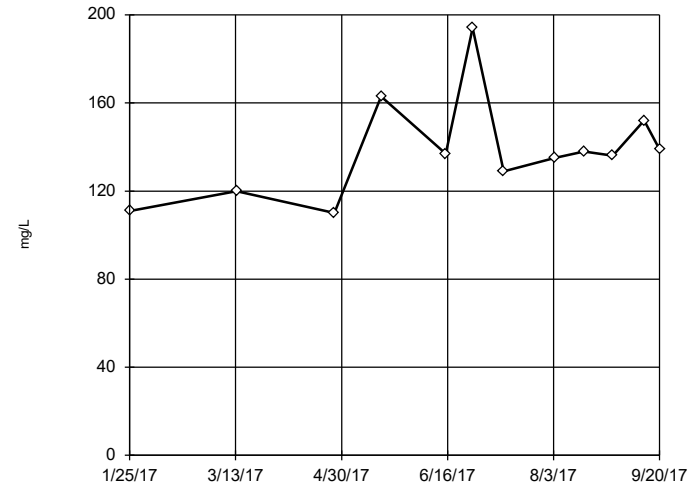


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 300.8, low cutoff = 22.18, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

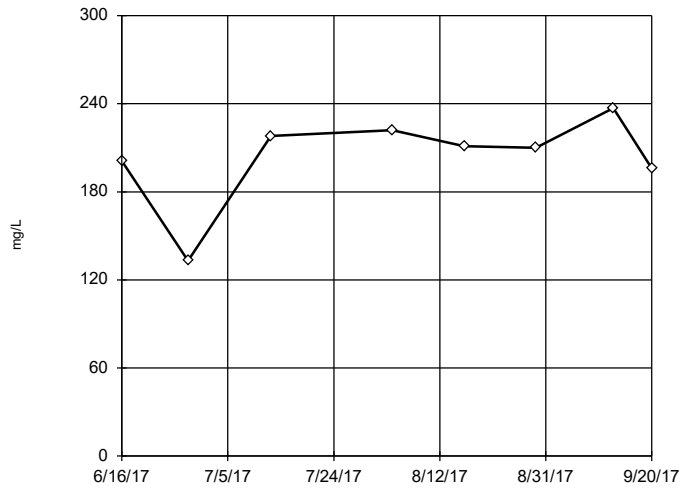


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 231.8, low cutoff = 78.03, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

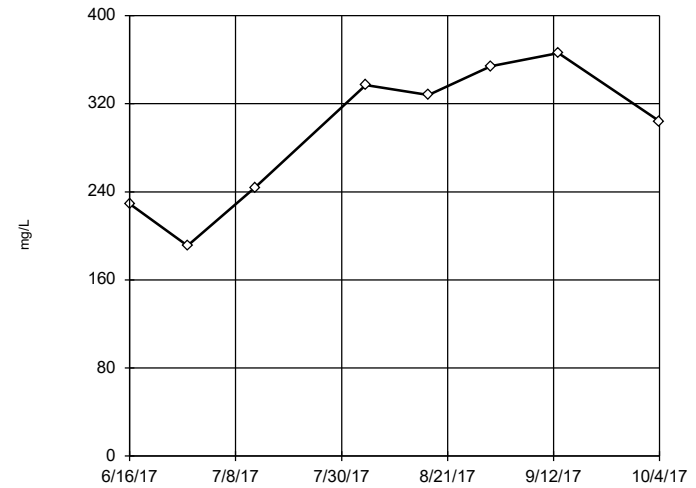


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*6 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 254.2, low cutoff = -213.7, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

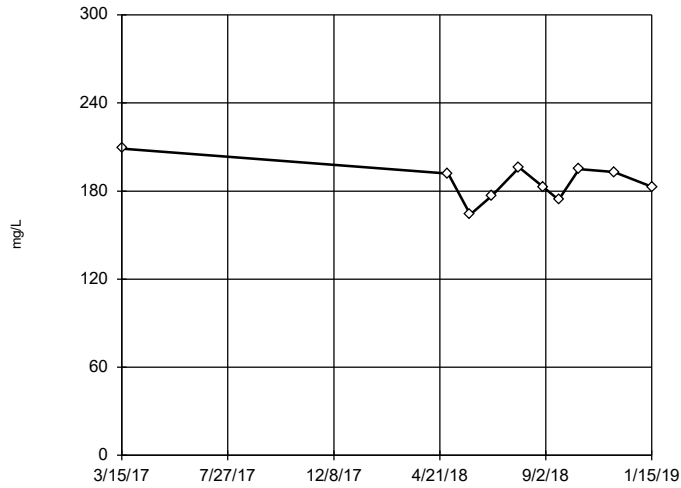
MW-9D



n = 8  
 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 = 467.5, low cutoff = -417.3, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

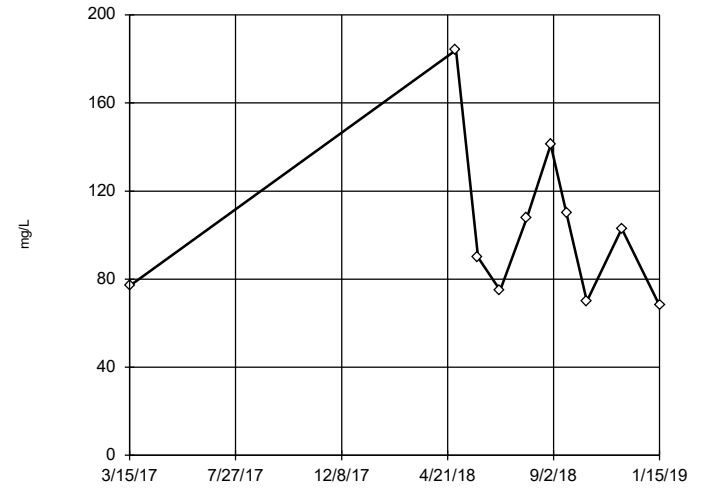
### Tukey's Outlier Screening MW-4D



n = 10  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 255.5, low cutoff = 115.5, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

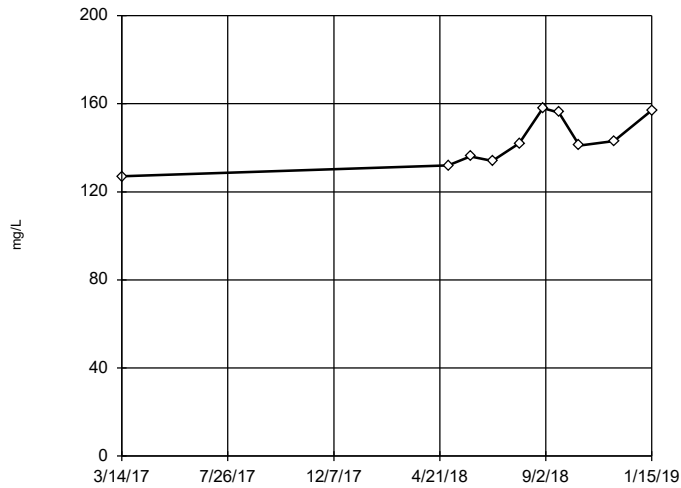
### Tukey's Outlier Screening MW-12D



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 = 633.7, low cutoff = 14.23, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

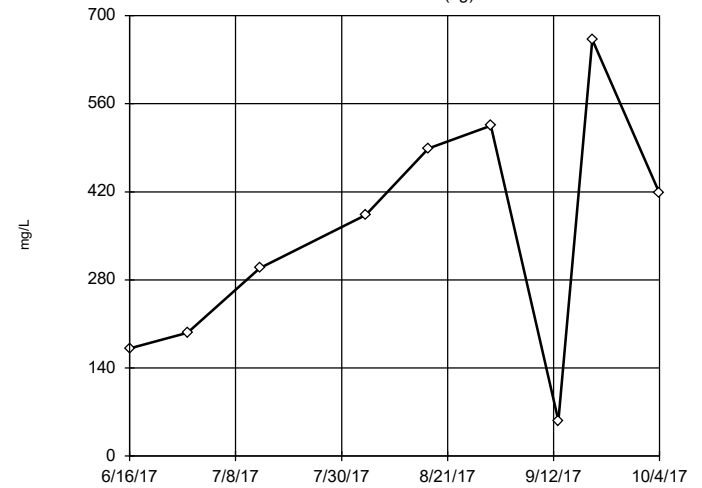
### Tukey's Outlier Screening MW-5D



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 = 255, low cutoff = 81.62, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening MW-7D (bg)

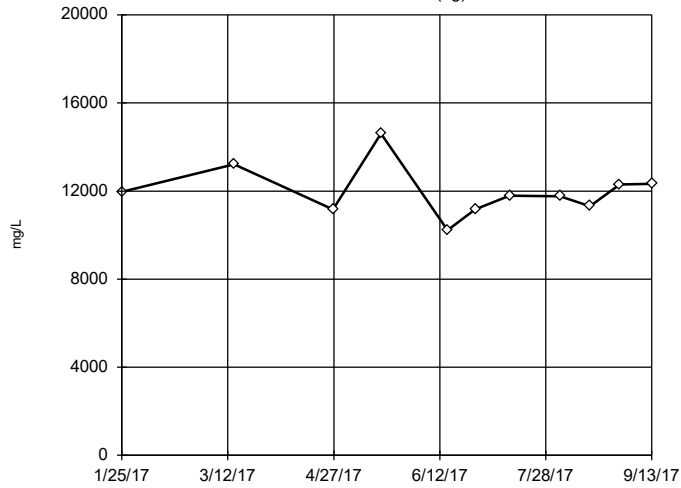


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 1478, low cutoff = -787, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

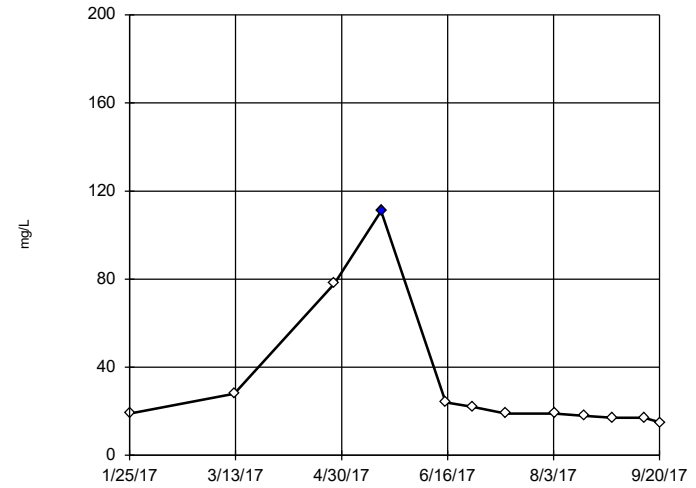


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 16585, low cutoff = 8306, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

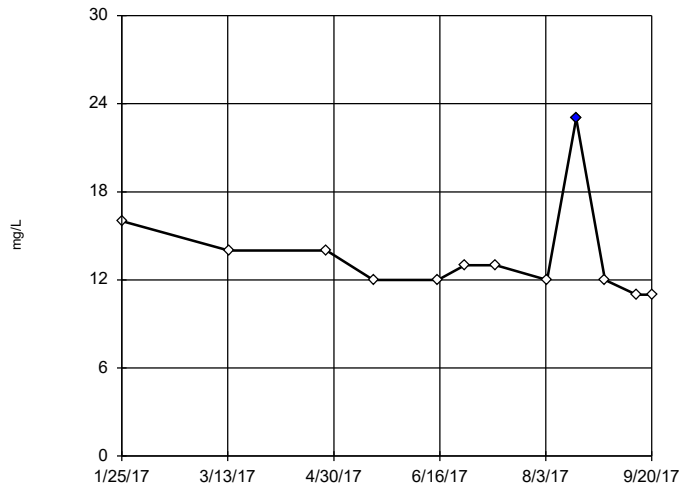


n = 12  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 84.36, low cutoff = 5.375, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

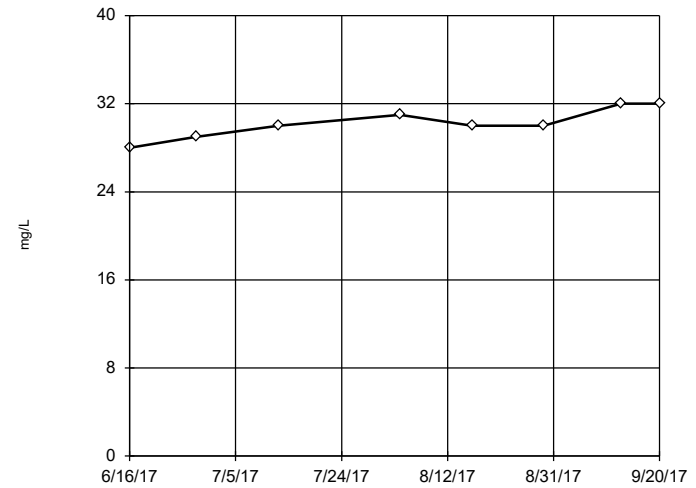


n = 12  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 22.23, low cutoff = 7.557, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

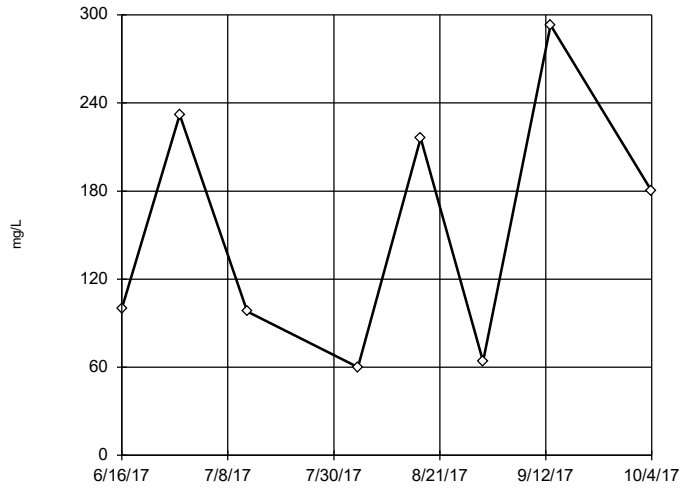


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 37.89, low cutoff = 23.89, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D

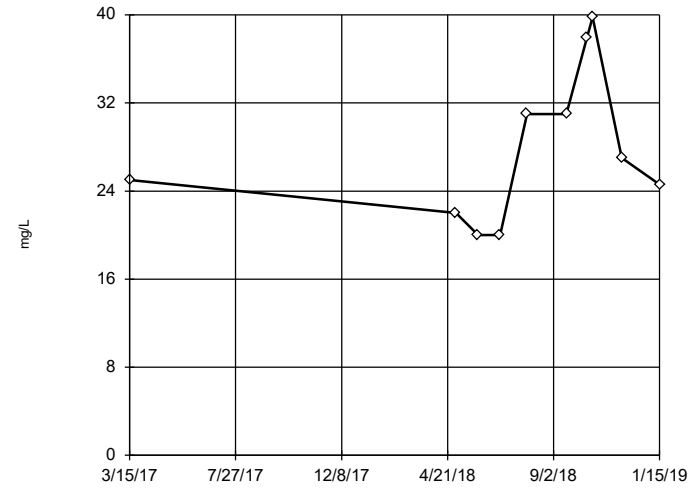


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1090, low cutoff = -82.7, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D

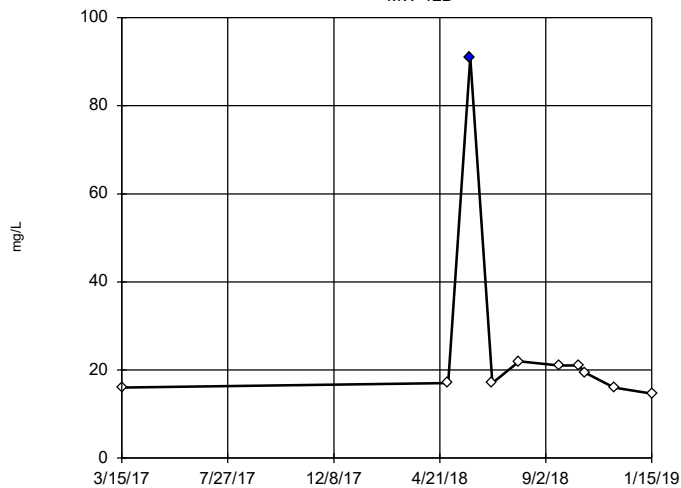


n = 10  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 149.6, low cutoff = 4.807, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-12D

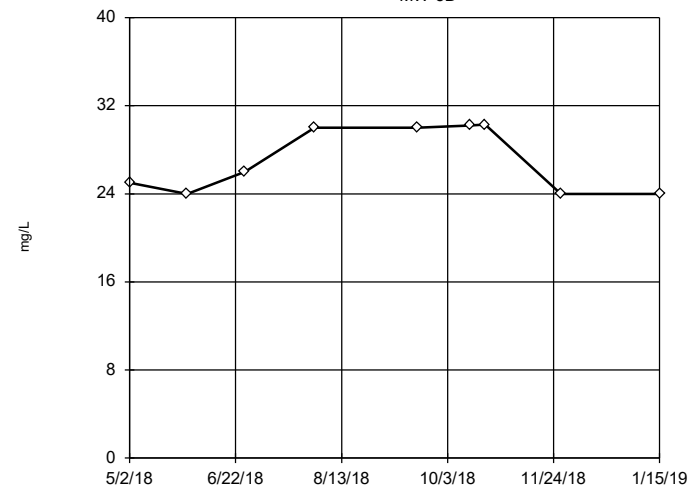


n = 10  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 52.11, low cutoff = 6.6, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

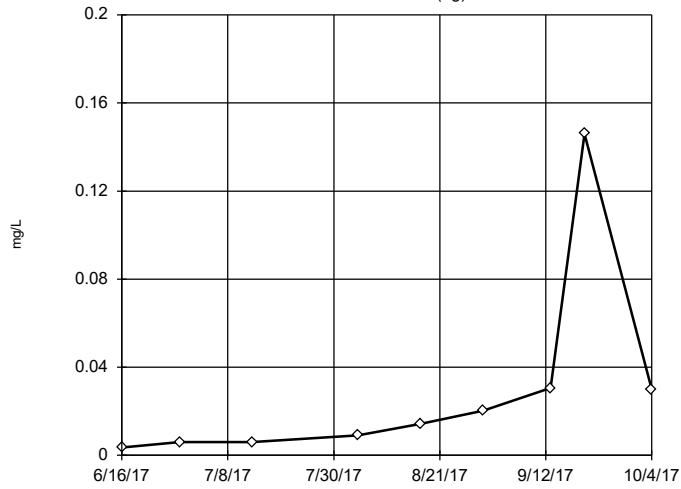
MW-5D



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 = 59.38, low cutoff = 12.17, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 7/16/2019 9:44 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

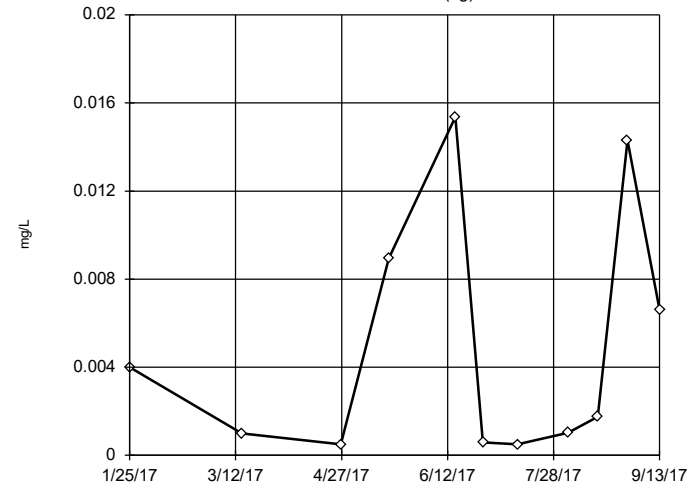
Tukey's Outlier Screening  
MW-7D (bg)



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 = 3.809, low cutoff = 0.00004793, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

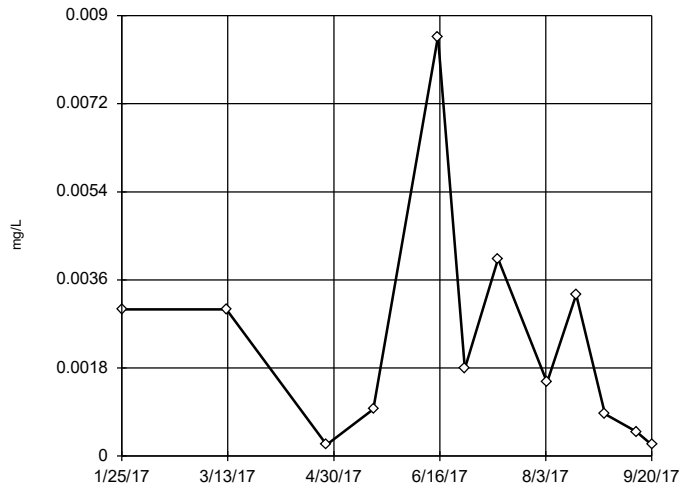
Tukey's Outlier Screening  
MW-8D (bg)



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 = 31.1, low cutoff = 1.7e-7, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

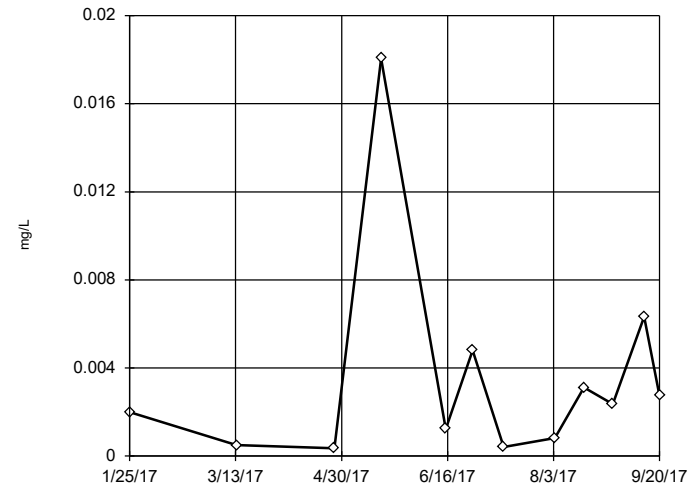
Tukey's Outlier Screening  
MW-15



n = 12  
No outliers found. Tukey's method selected by user.  
Data were cube root transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.03417, low cutoff = -0.0007467, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

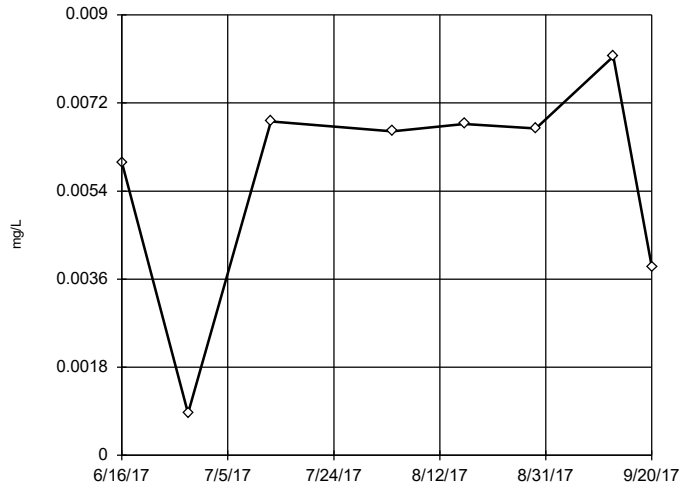
Tukey's Outlier Screening  
MW-3D



n = 12  
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 = 0.8488, low cutoff = 0.000002915, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

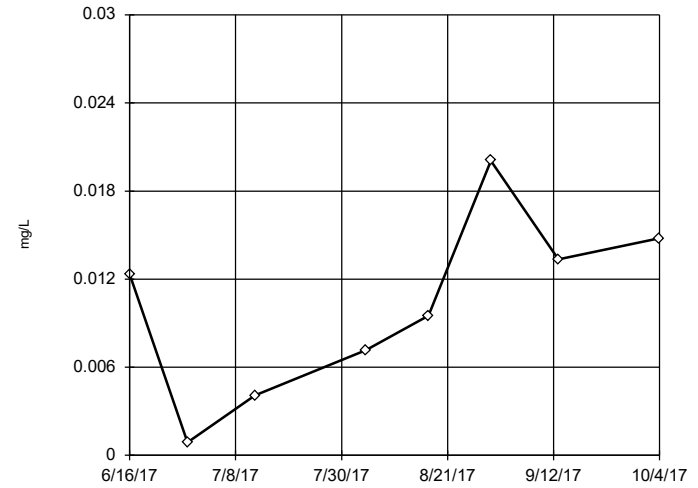
### Tukey's Outlier Screening MW-6D



n = 8  
No outliers found. Tukey's method selected by user.  
Data were cube transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.009459, low cutoff = -0.007346, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

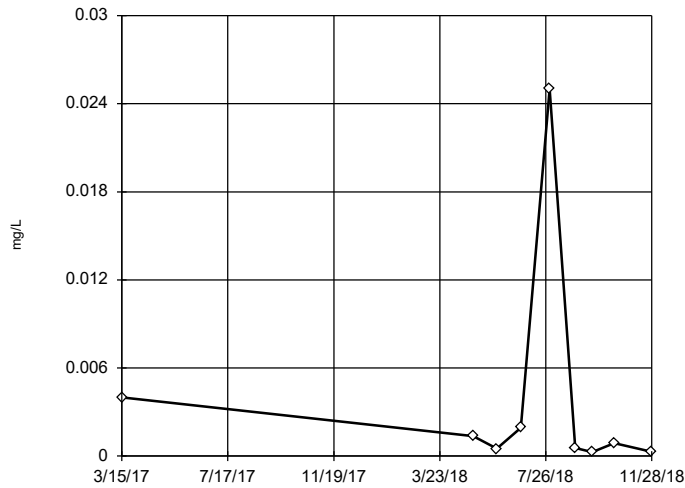
### Tukey's Outlier Screening MW-9D



n = 8  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
High cutoff = 0.0394, low cutoff = -0.01972, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

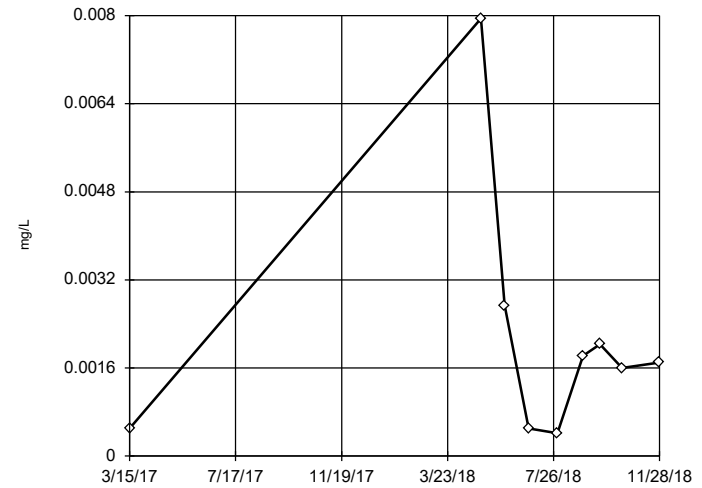
### Tukey's Outlier Screening MW-4D



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 = 1.026, low cutoff = 0.000001049, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

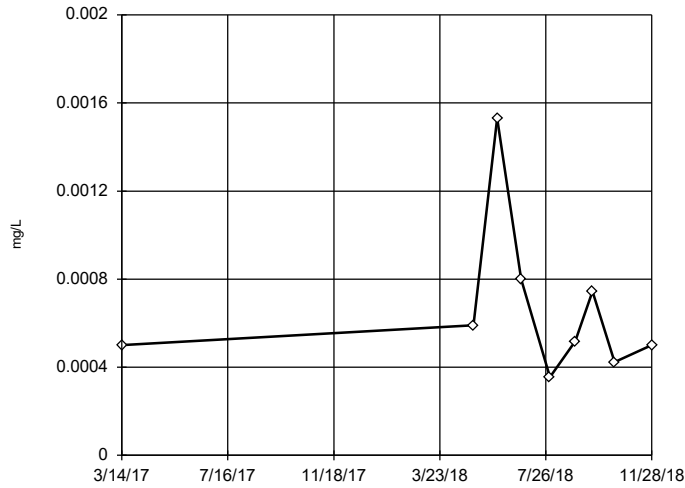
### Tukey's Outlier Screening MW-12D



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 = 0.2475, low cutoff = 0.000004764, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

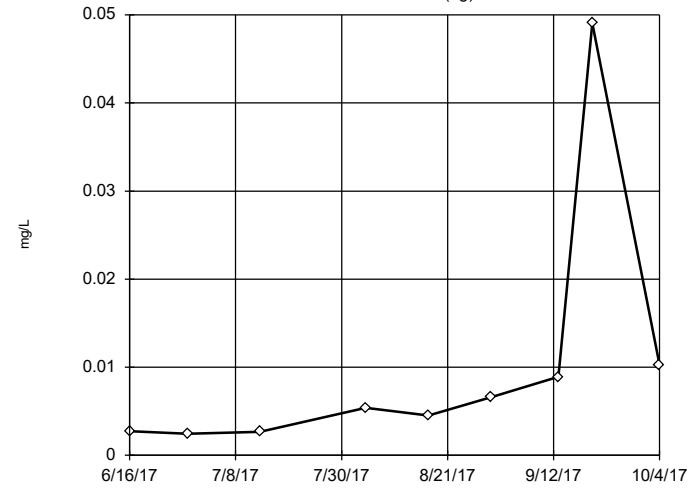
Tukey's Outlier Screening  
MW-5D



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 = 0.003652, low cutoff = 0.00009722, based on IQR multiplier of 3.

Constituent: Chromium Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

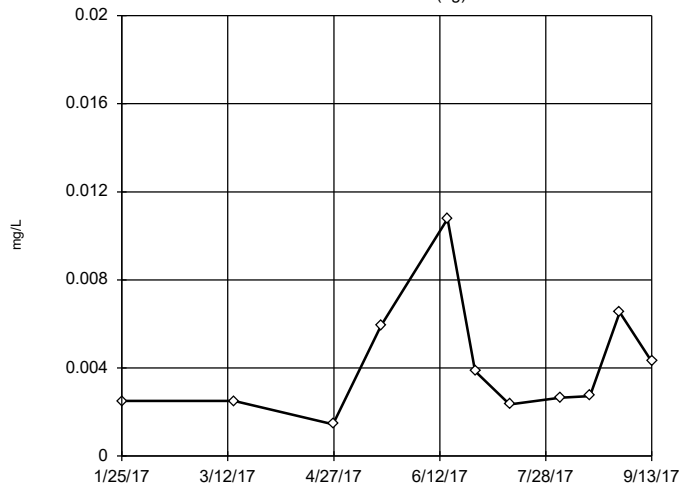
Tukey's Outlier Screening  
MW-7D (bg)



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 = 0.4239, low cutoff = 0.00006106, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

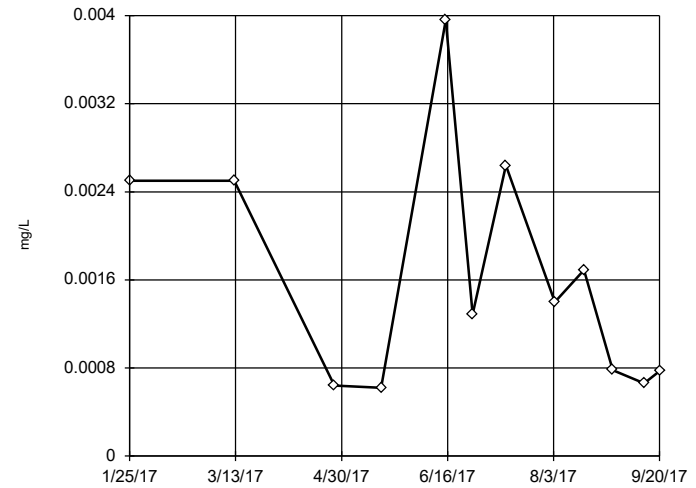
Tukey's Outlier Screening  
MW-8D (bg)



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 = 0.07861, low cutoff = 0.0001883, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

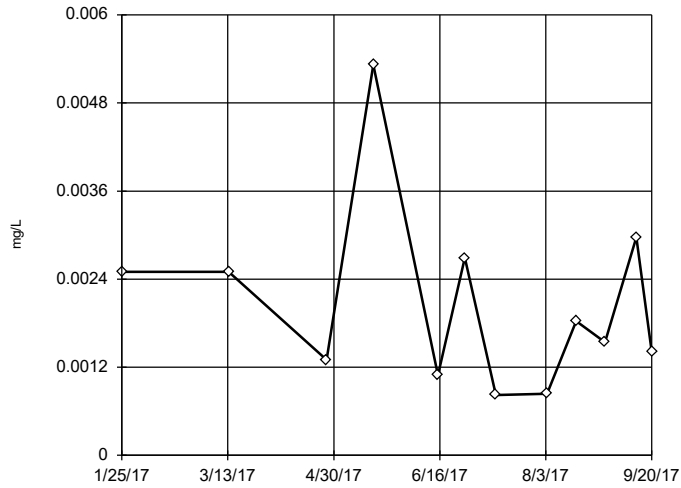
Tukey's Outlier Screening  
MW-15



n = 12  
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 = 0.1078, low cutoff = 0.00001653, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:44 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

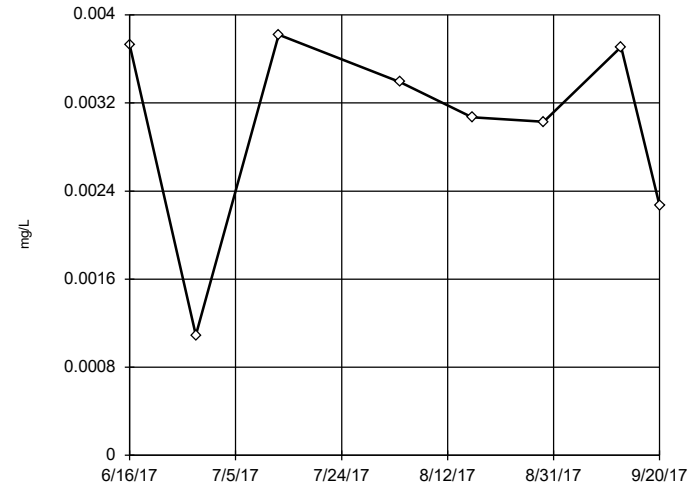
Tukey's Outlier Screening  
MW-3D



n = 12  
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 = 0.02681, low cutoff = 0.0001151, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

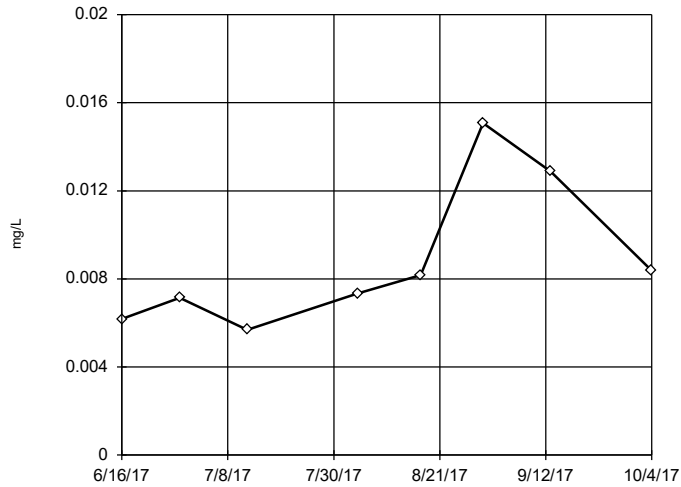
Tukey's Outlier Screening  
MW-6D



n = 8  
No outliers found. Tukey's method selected by user.  
Data were x<sup>4</sup> transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.004949, low cutoff = -0.004334, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

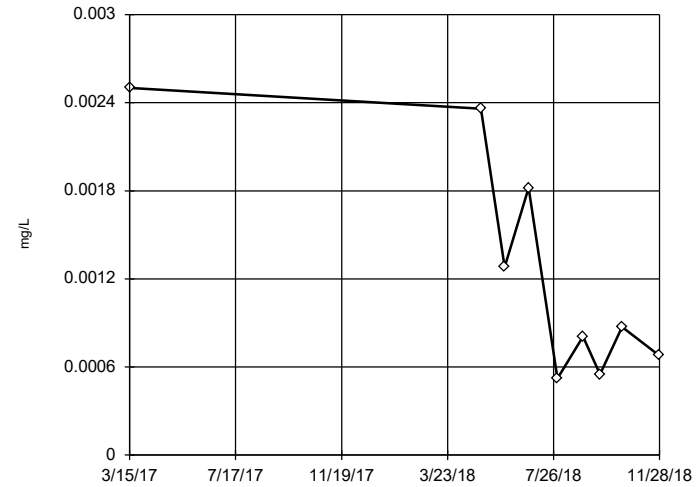
Tukey's Outlier Screening  
MW-9D



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 = 0.03975, low cutoff = 0.001736, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-4D

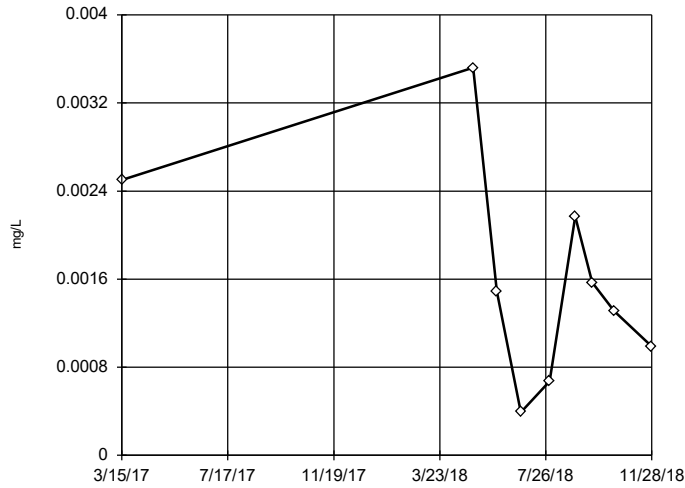


n = 9  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.08098, low cutoff = 0.00001563, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF



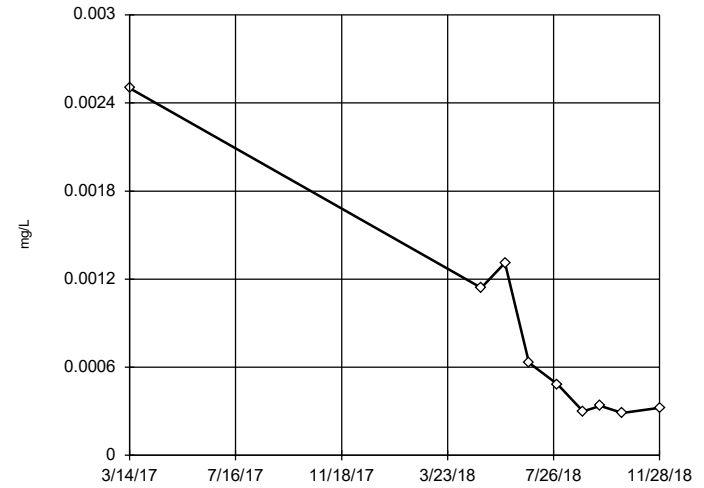
Tukey's Outlier Screening  
MW-12D



n = 9  
No outliers found. Tukey's method selected by user.  
Data were cube root transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.01551, low cutoff = -0.0001242, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

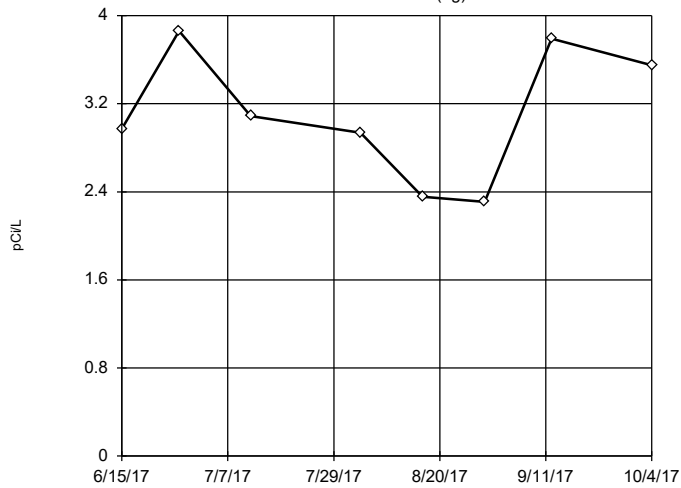
Tukey's Outlier Screening  
MW-5D



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 = 0.0736, low cutoff = 0.000005177, based on IQR multiplier of 3.

Constituent: Cobalt Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

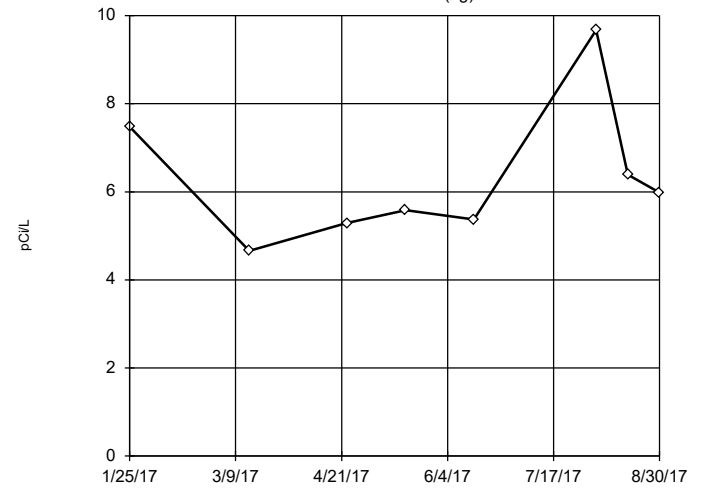
Tukey's Outlier Screening  
MW-7D (bg)



n = 8  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
High cutoff = 6.741, low cutoff = -0.424, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-8D (bg)

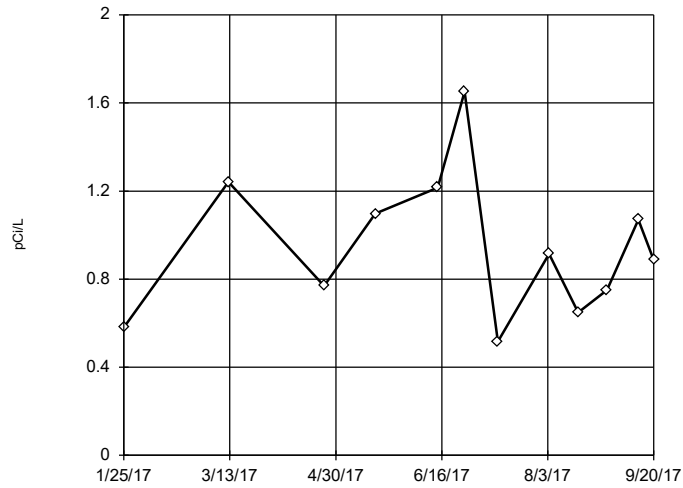


n = 8  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 15.09, low cutoff = 2.442, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

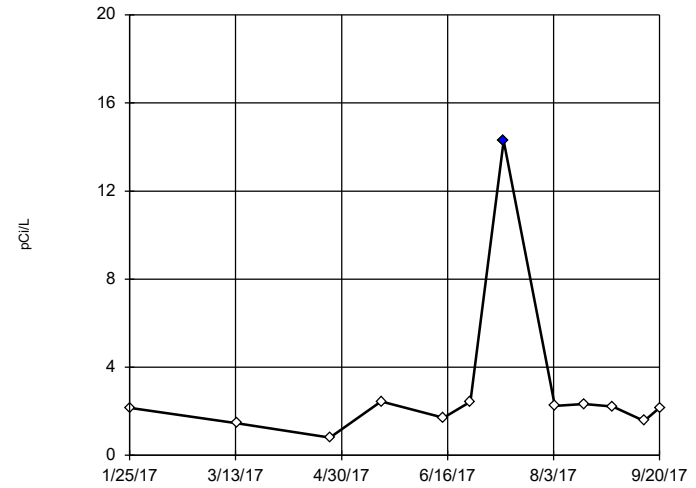


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 5.231, low cutoff = 0.154, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

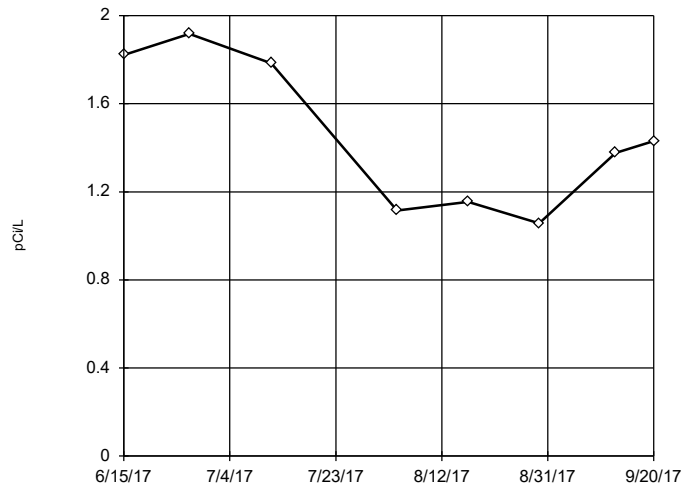


n = 12  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 7.335, low cutoff = 0.5301, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

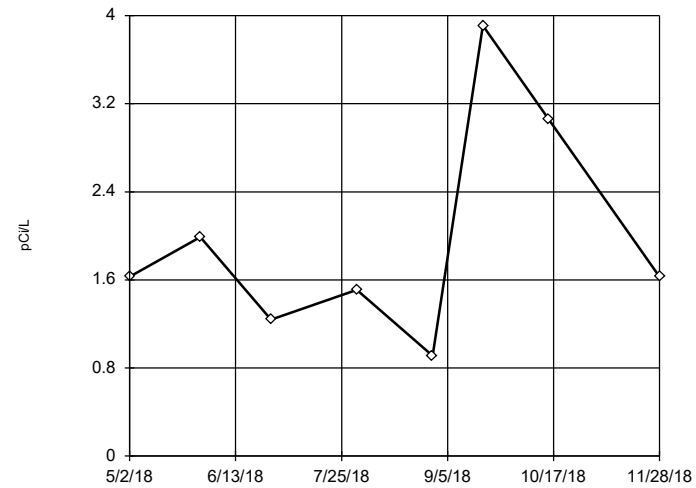


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 7.229, low cutoff = 0.283, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

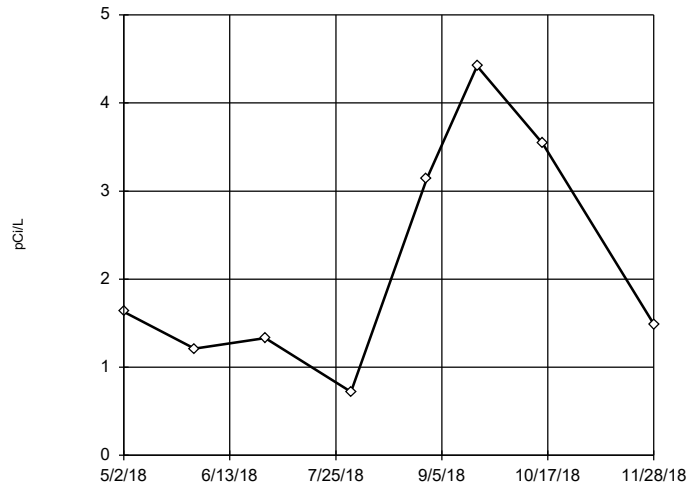
MW-4D



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 = 14.47, low cutoff = 0.2333, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

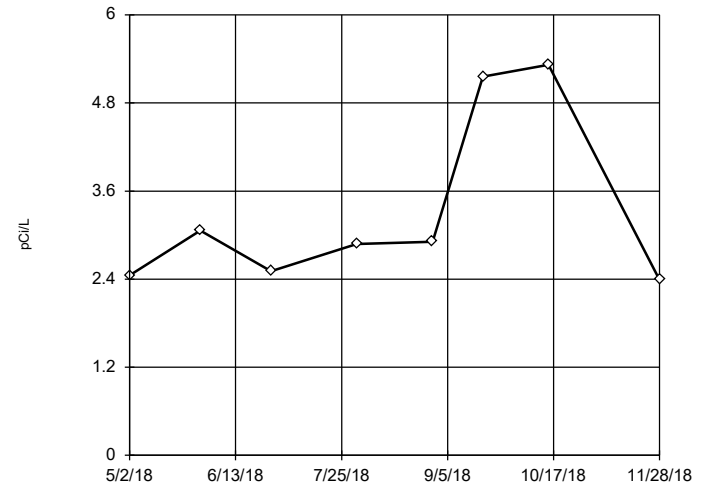
Tukey's Outlier Screening  
MW-12D



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 = 60.52, low cutoff = 0.06988, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

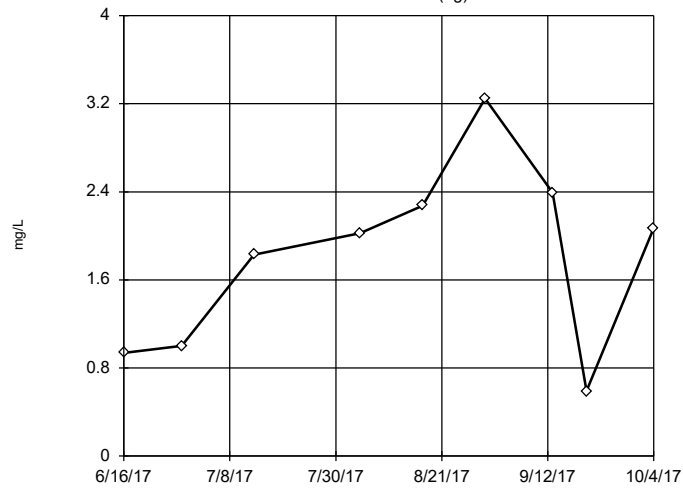
Tukey's Outlier Screening  
MW-5D



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 = 16.35, low cutoff = 0.6027, based on IQR multiplier of 3.

Constituent: Combined Radium 226 + 228 Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

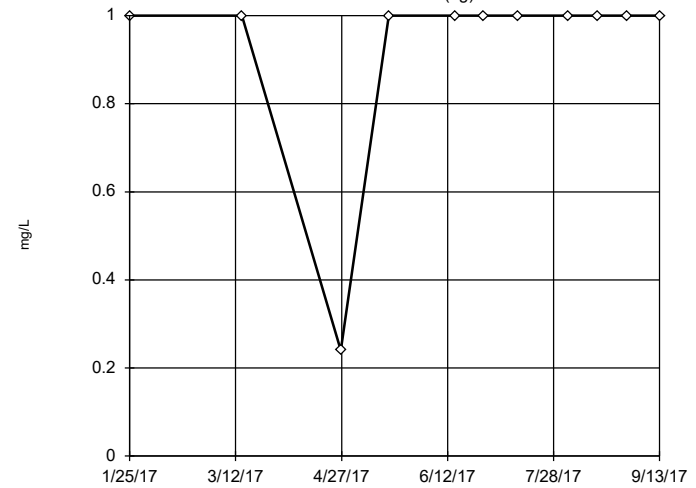
Tukey's Outlier Screening  
MW-7D (bg)



n = 9  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
High cutoff = 6.428, low cutoff = -3.126, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-8D (bg)

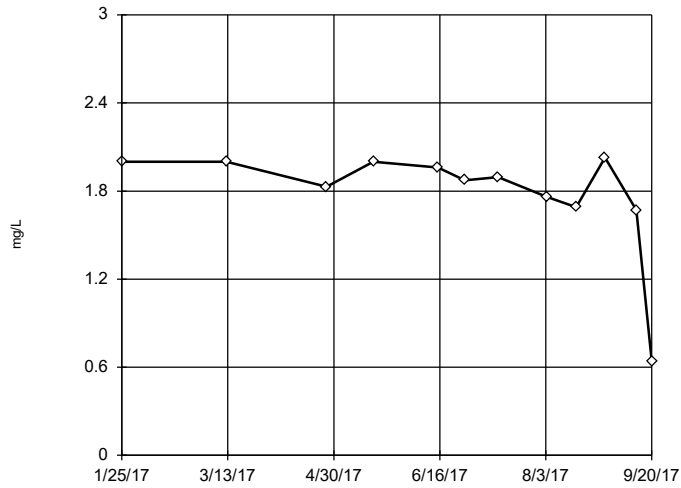


n = 11  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

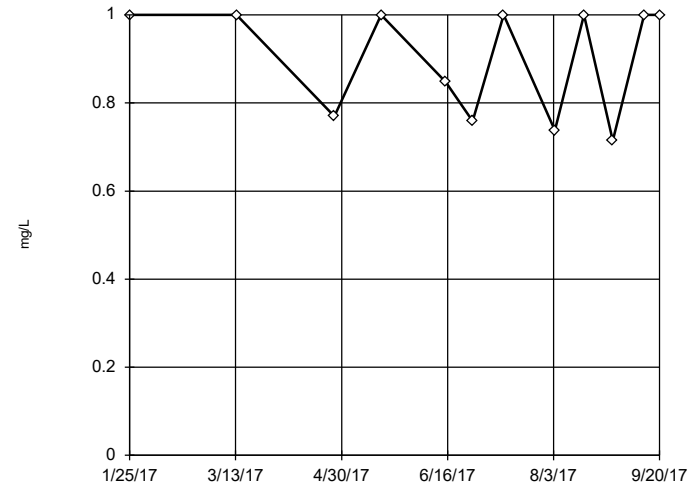


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x<sup>6</sup> transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 2.368, low cutoff = -2.101, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

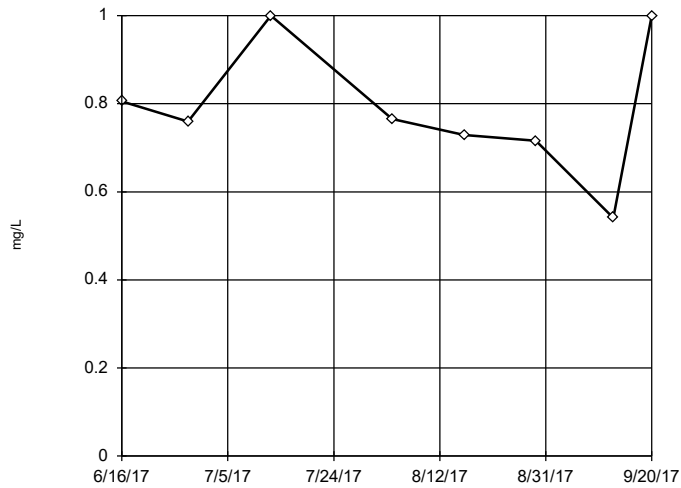


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 2.238, low cutoff = 0.3416, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

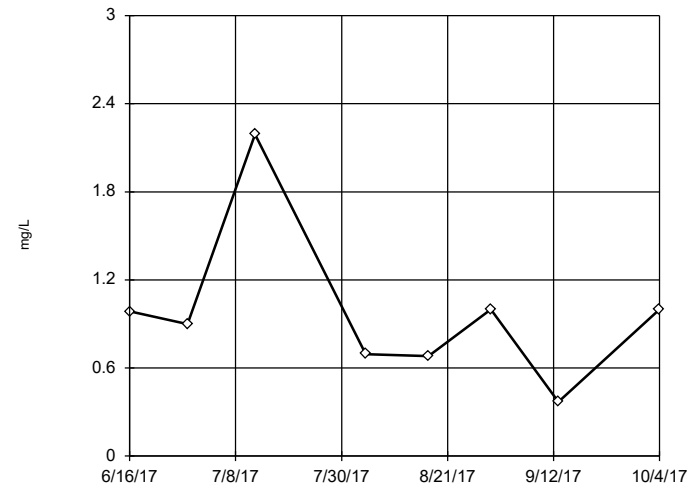


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 1.598, low cutoff = 0.3335, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

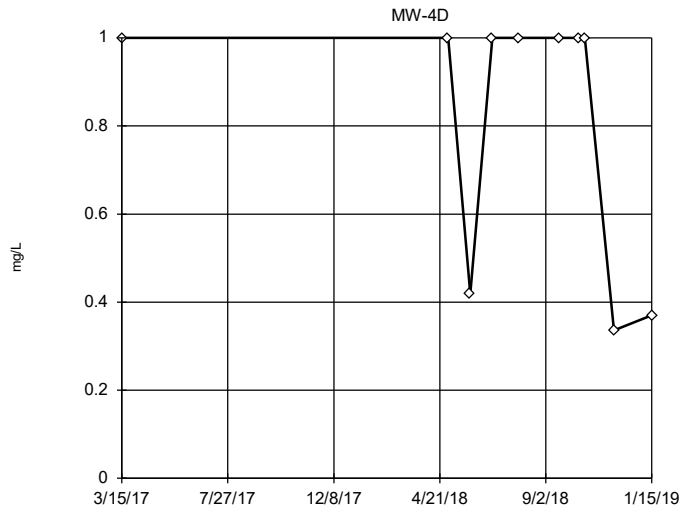
MW-9D



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 = 3.073, low cutoff = 0.2238, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

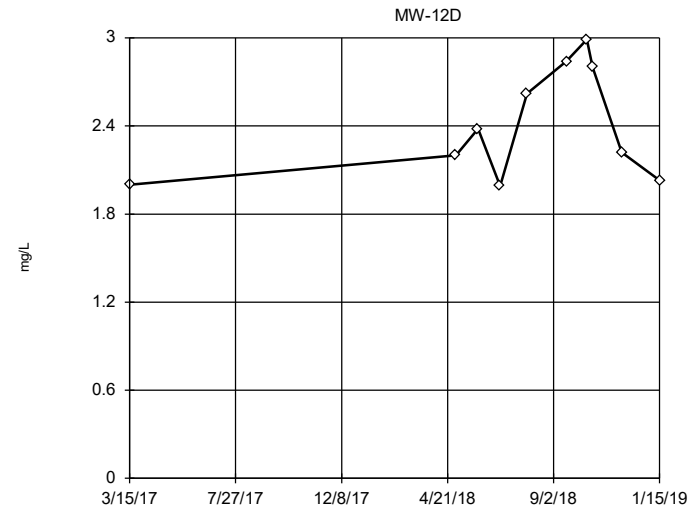
### Tukey's Outlier Screening



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 = 16.38, low cutoff = 0.02403, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

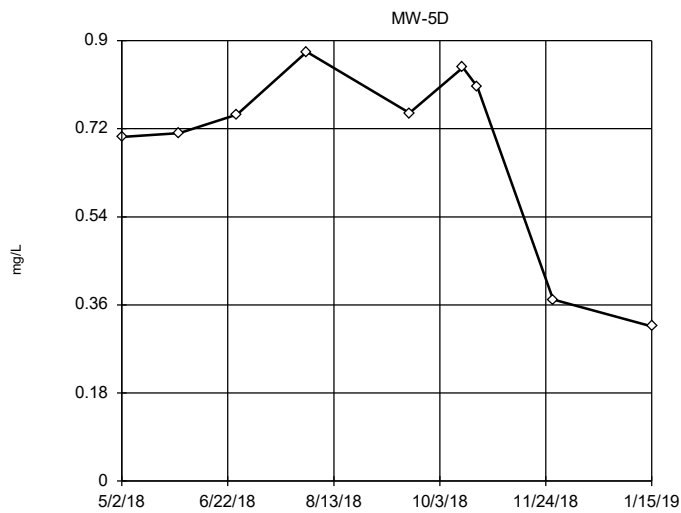
### Tukey's Outlier Screening



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 = 7.73, low cutoff = 0.7351, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

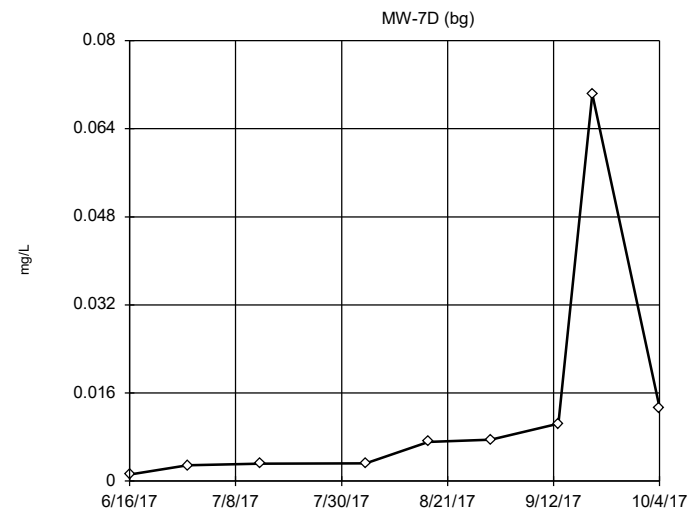
### Tukey's Outlier Screening



n = 9  
 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 = 1.05, low cutoff = -0.9561, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

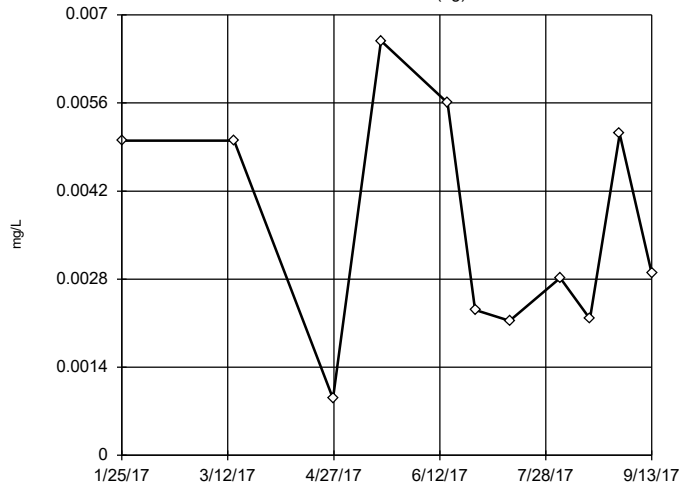


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.6993, low cutoff = 0.00005122, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

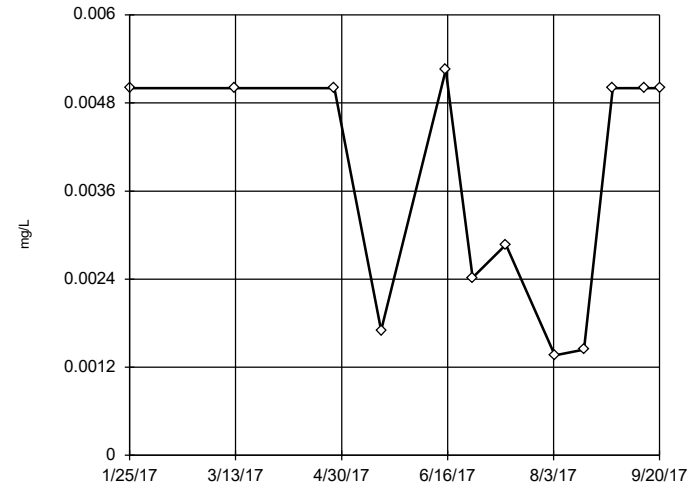


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.02137,  
 low cutoff = -0.0007907,  
 based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

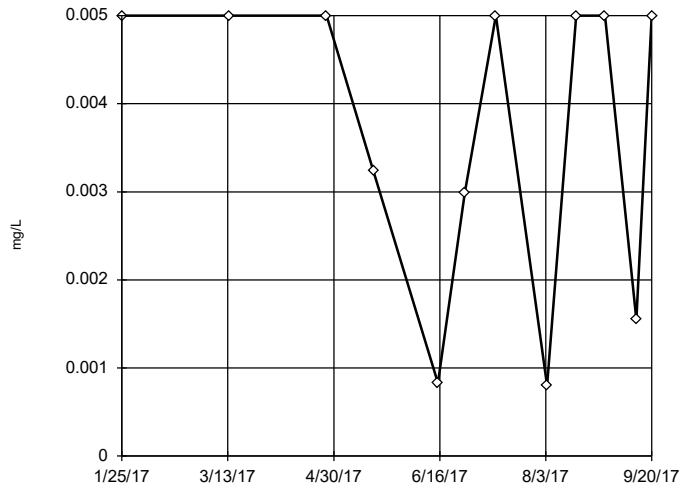


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0749,  
 low cutoff = 0.0001354,  
 based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

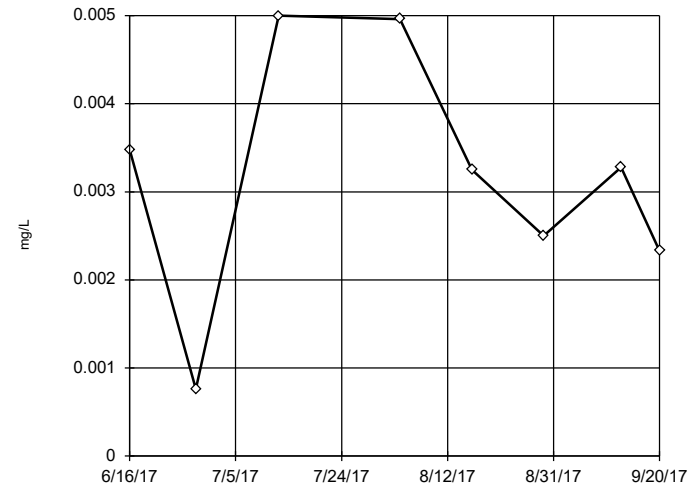


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.01319,  
 low cutoff = -0.00592,  
 based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

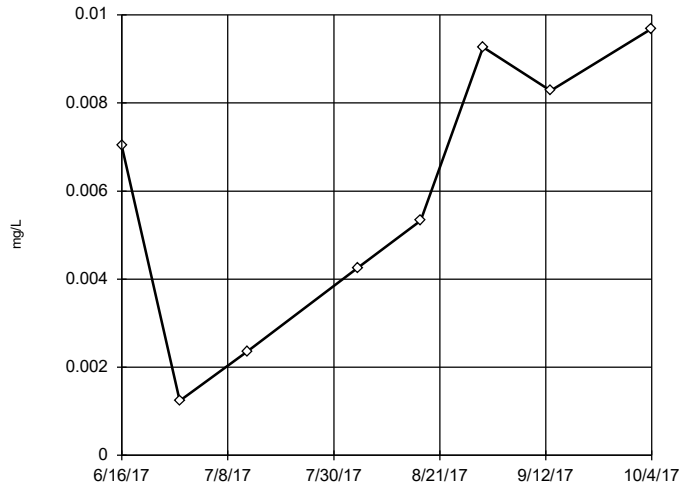


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.009635,  
 low cutoff = -0.003,  
 based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D

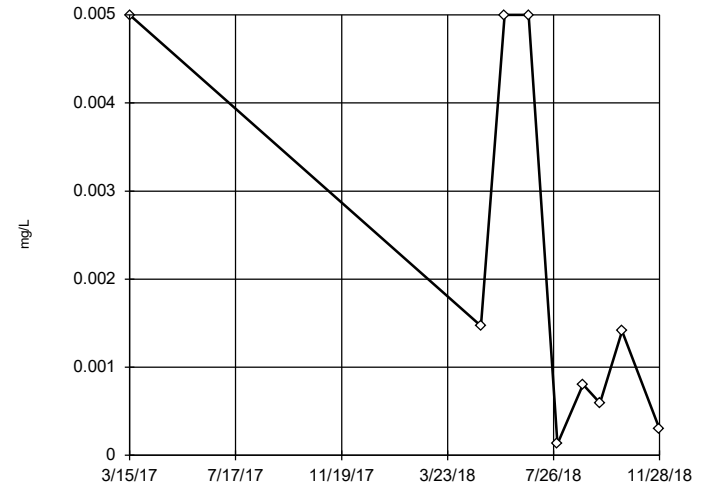


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.02517, low cutoff = -0.01309, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D

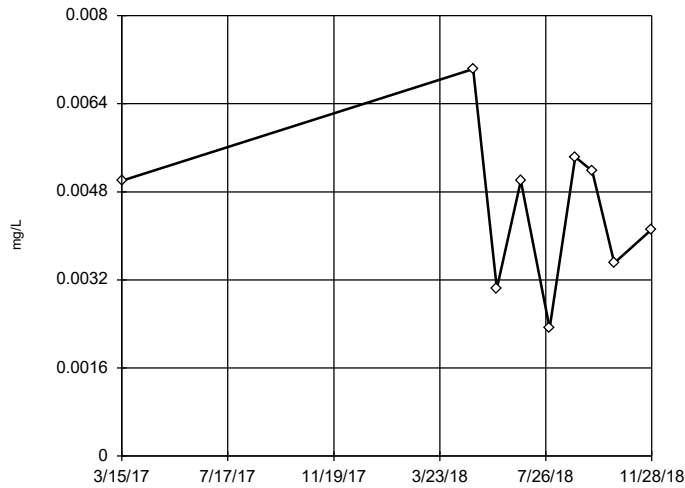


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 8.287, low cutoff = 2.5e-7, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-12D

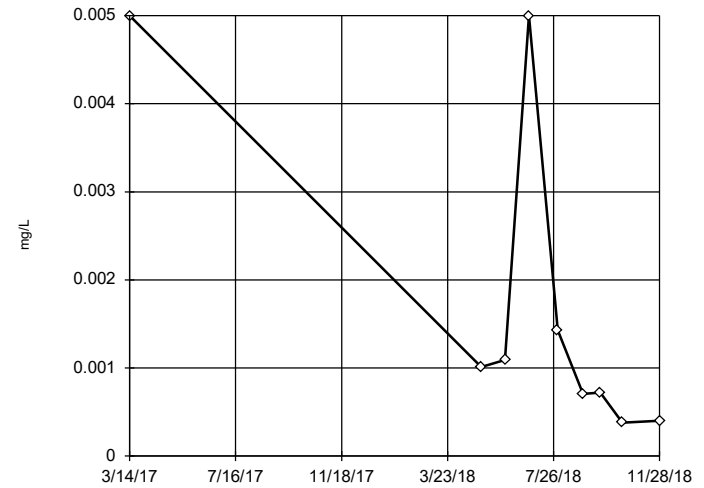


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.0114, low cutoff = -0.002815, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

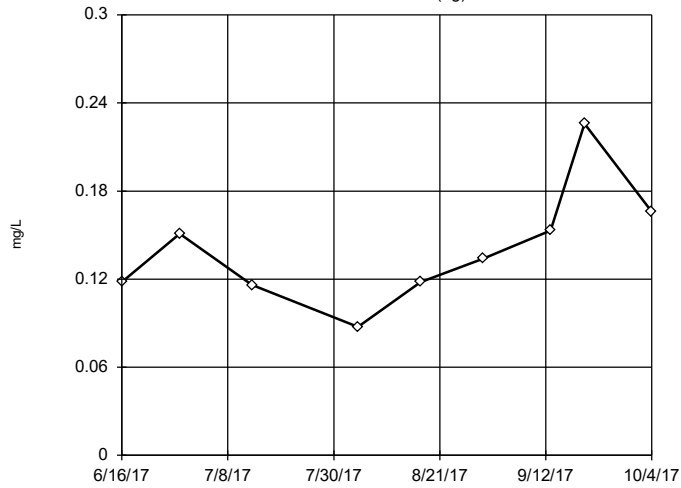
MW-5D



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 = 0.3407, low cutoff = 0.000004171, based on IQR multiplier of 3.

Constituent: Lead Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

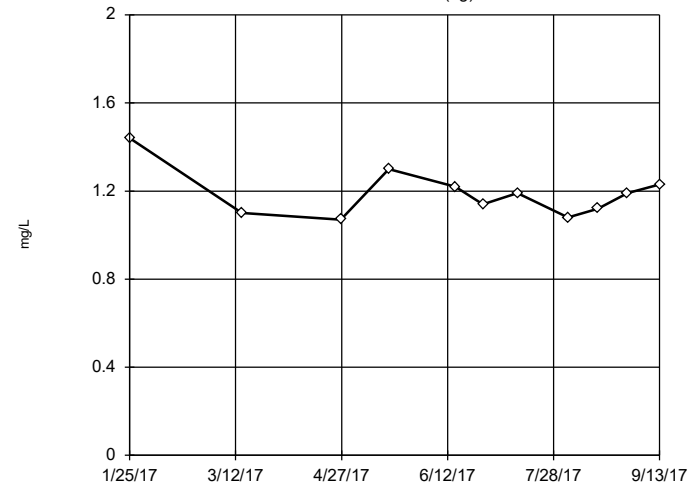
Tukey's Outlier Screening  
MW-7D (bg)



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 = 0.4028, low cutoff = 0.04629, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

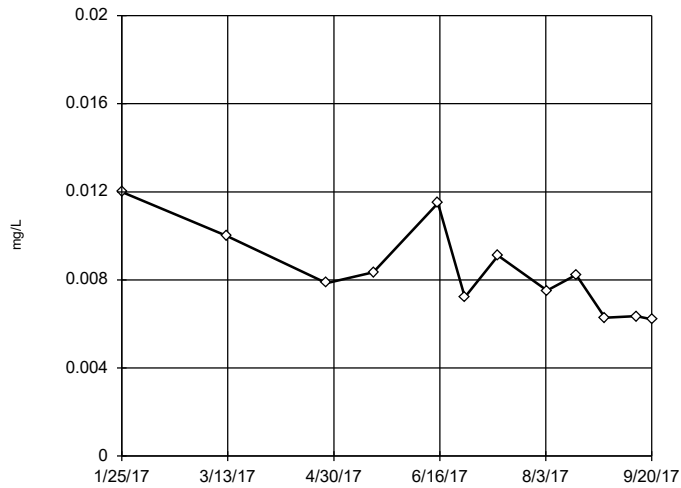
Tukey's Outlier Screening  
MW-8D (bg)



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 = 1.72, low cutoff = 0.7868, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

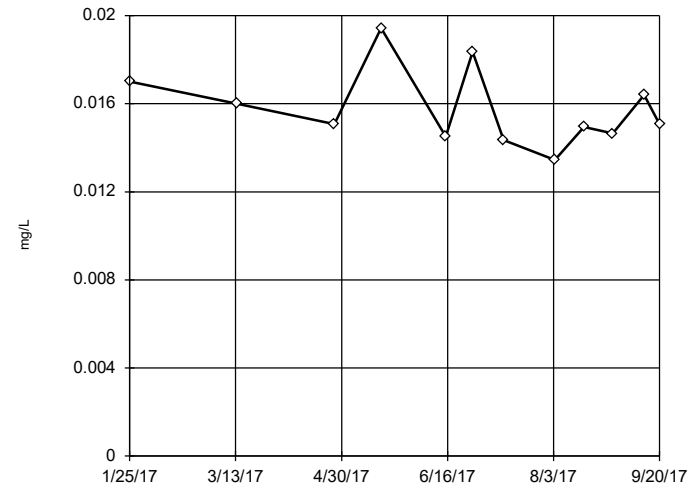
Tukey's Outlier Screening  
MW-15



n = 12  
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 = 0.02668, low cutoff = 0.002421, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-3D



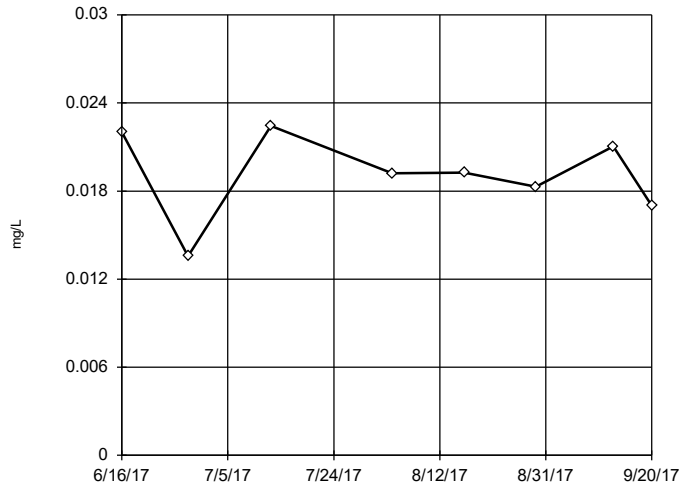
n = 12  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 0.02505, low cutoff = 0.009716, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF



### Tukey's Outlier Screening

MW-6D

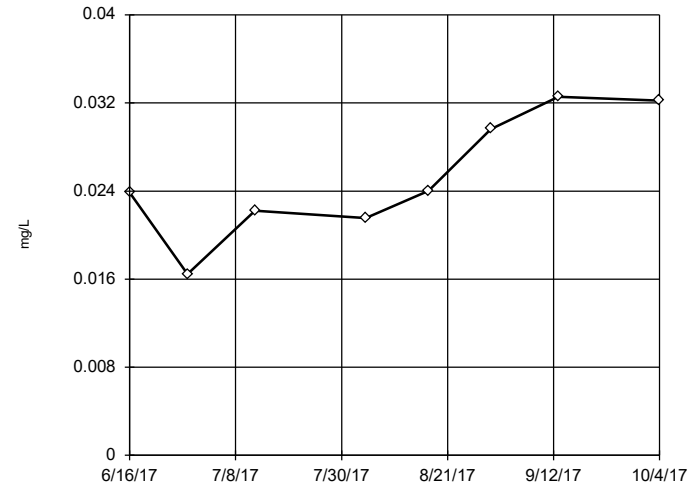


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.02863,  
 low cutoff = -0.01996,  
 based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D

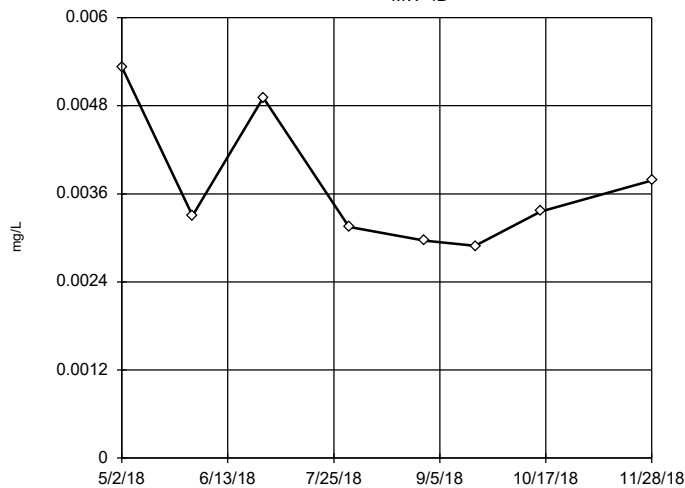


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.06738,  
 low cutoff = 0.004117,  
 based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D

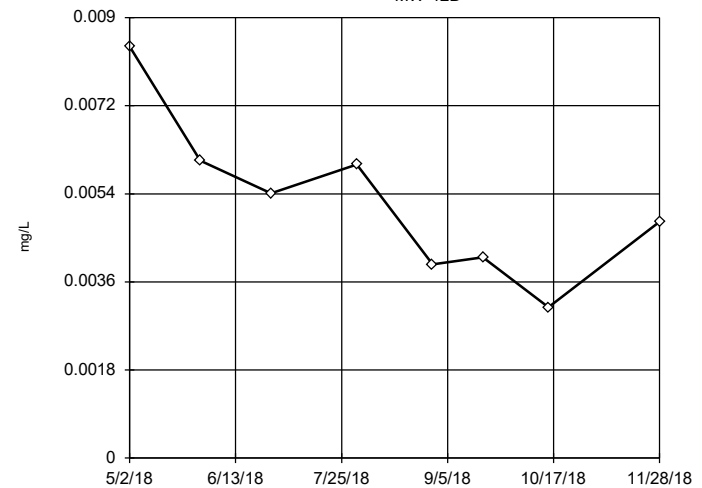


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0121,  
 low cutoff = 0.001087,  
 based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

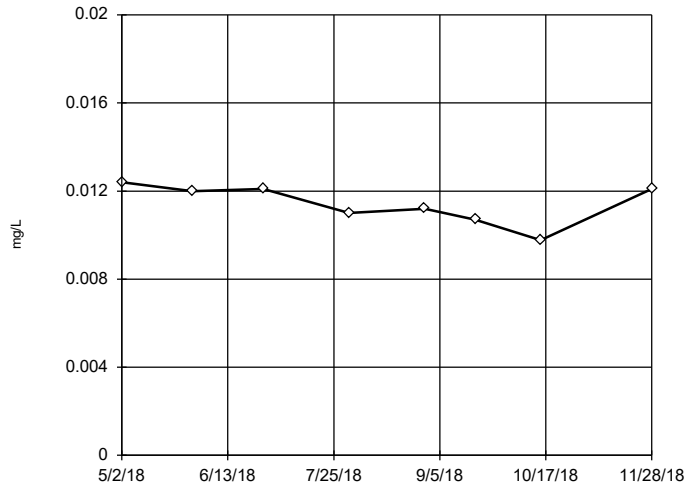
MW-12D



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 = 0.02034,  
 low cutoff = 0.001196,  
 based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

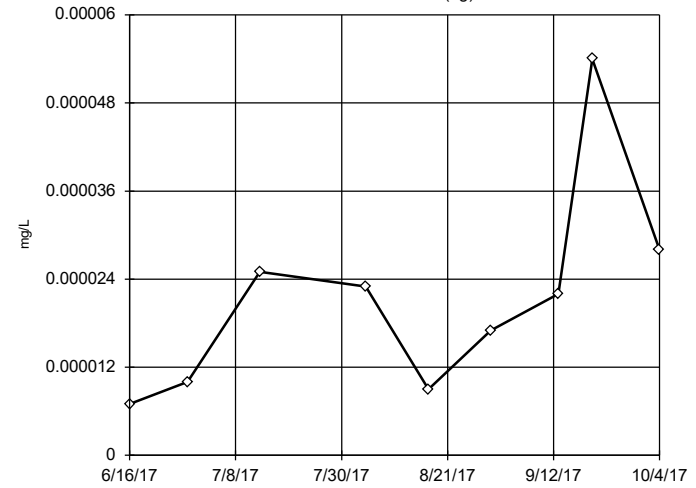
Tukey's Outlier Screening  
MW-5D



n = 8  
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 = 0.01404, low cutoff = -0.01192, based on IQR multiplier of 3.

Constituent: Lithium Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

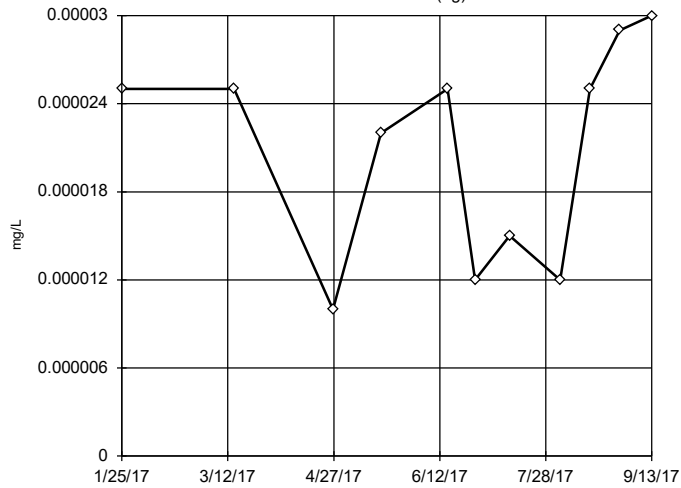
Tukey's Outlier Screening  
MW-7D (bg)



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 = 0.0005739, low cutoff = 4.4e-7, based on IQR multiplier of 3.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

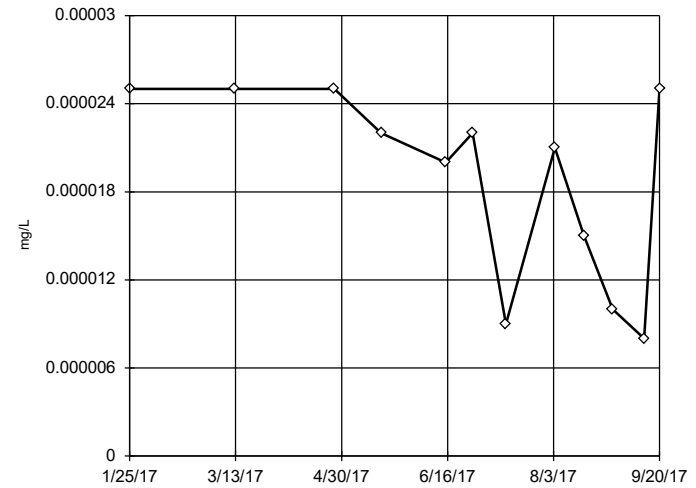
Tukey's Outlier Screening  
MW-8D (bg)



n = 11  
No outliers found. Tukey's method selected by user.  
Data were cube transformed to achieve best W statistic (graph shown in original units).  
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-15

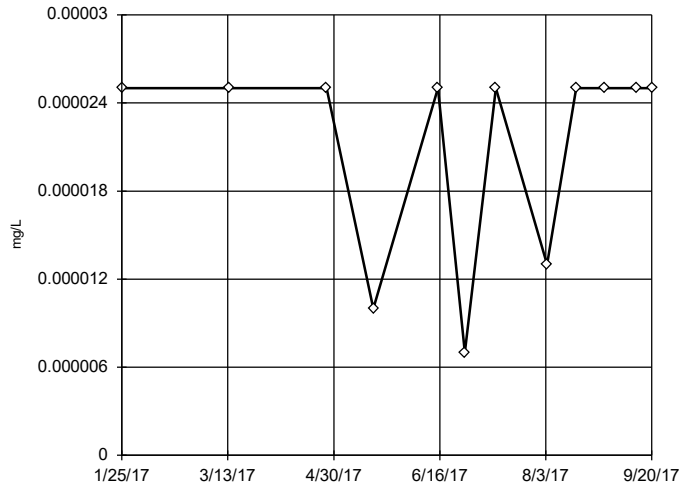


n = 12  
No outliers found. Tukey's method selected by user.  
Data were cube transformed to achieve best W statistic (graph shown in original units).  
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D



n = 12

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

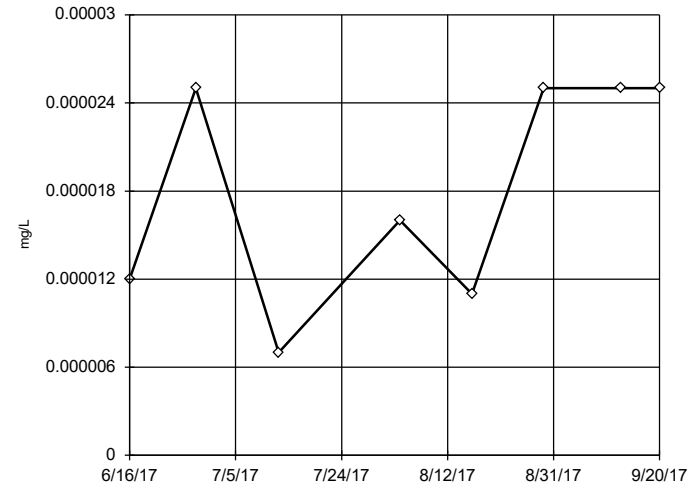
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.00006667, low cutoff = 0.00000676, based on IQR multiplier of 3.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D



n = 8

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

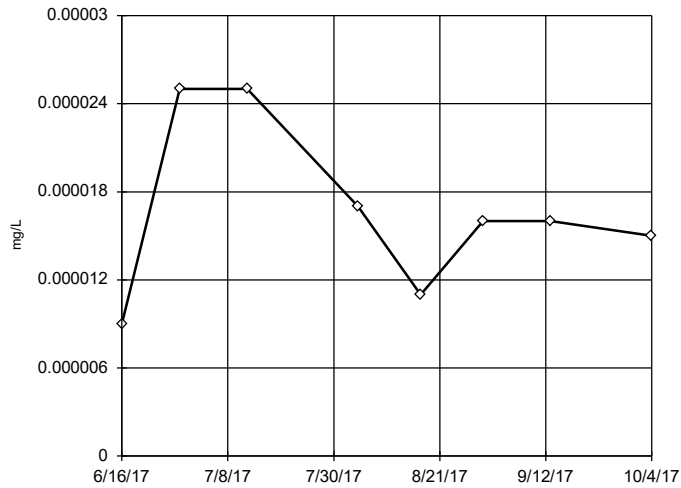
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.0002576, low cutoff = 0.000001115, based on IQR multiplier of 3.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D



n = 8

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

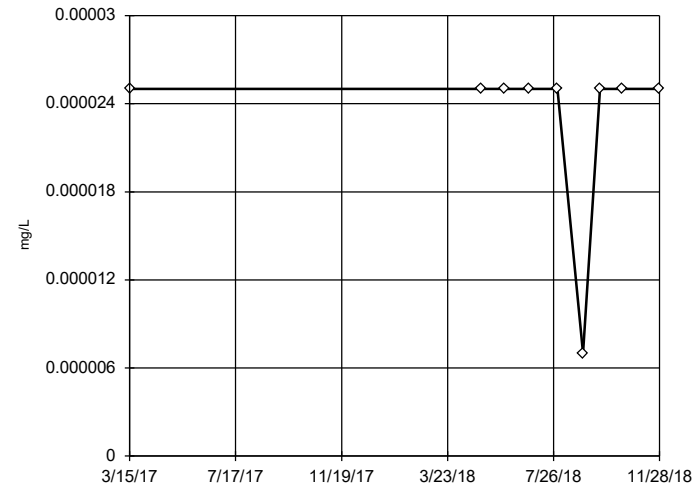
Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.00008522, low cutoff = 0.000003107, based on IQR multiplier of 3.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D



n = 9

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

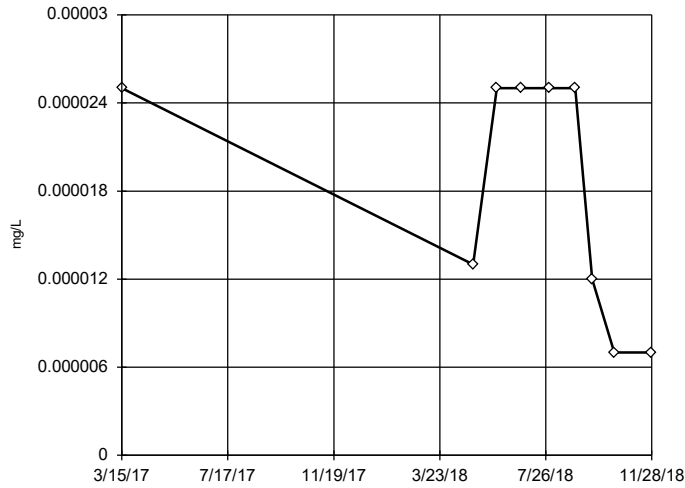
Data were cube root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-12D

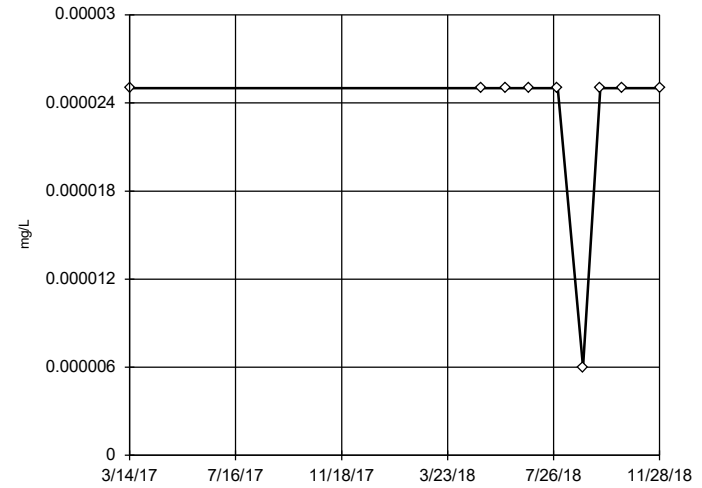


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0005074, low cutoff = 4.5e-7, based on IQR multiplier of 3.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-5D

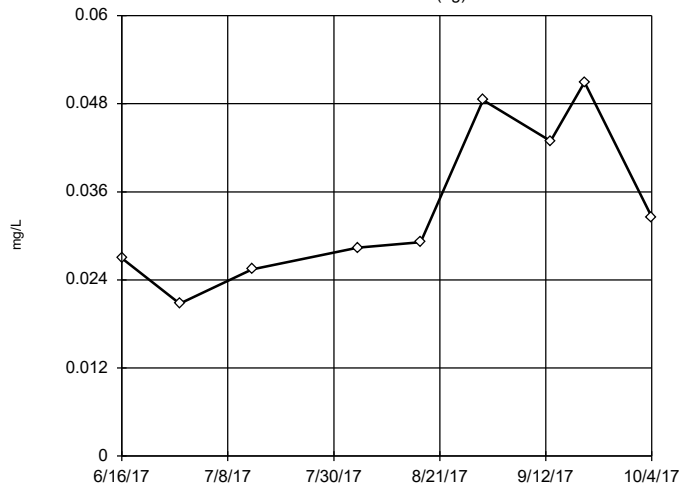


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-7D (bg)

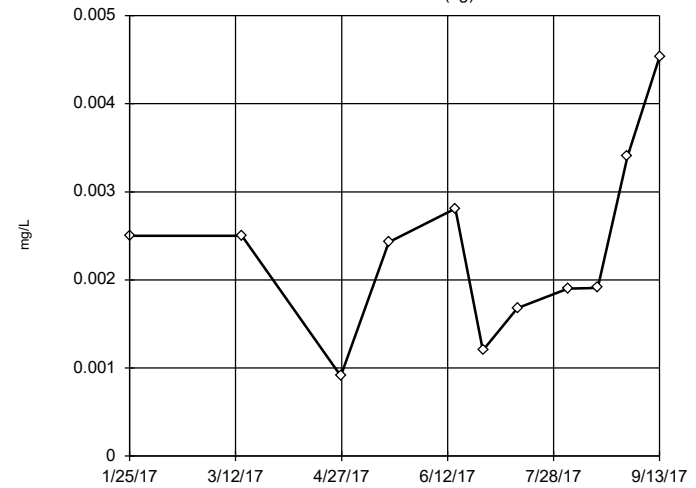


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.2409, low cutoff = 0.00496, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

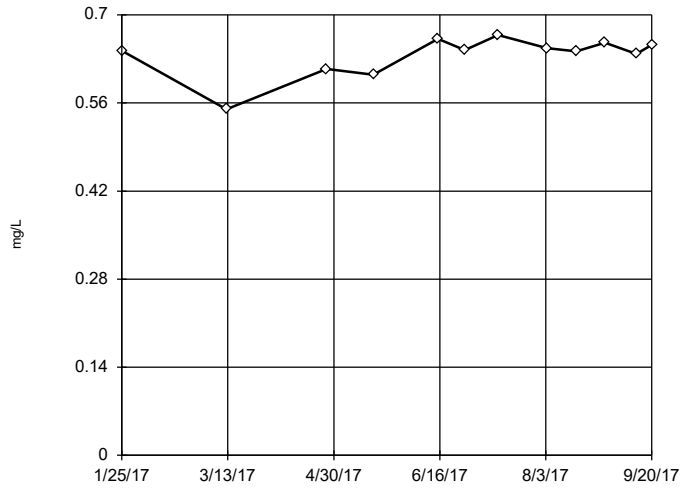


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.008975, low cutoff = 0.000142, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

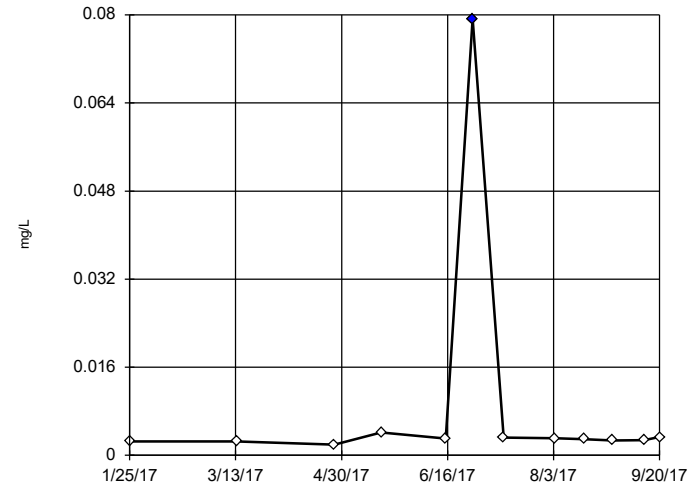


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*6 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.7131,  
 low cutoff = 0.4401, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

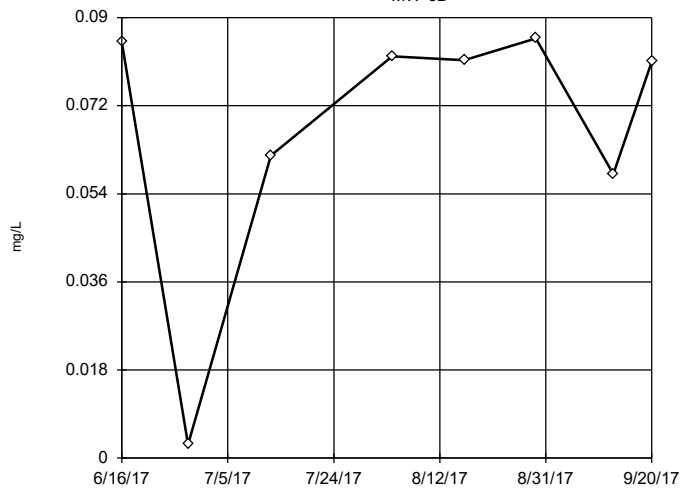


n = 12  
 Outlier is drawn as solid.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.00663,  
 low cutoff = 0.001278, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

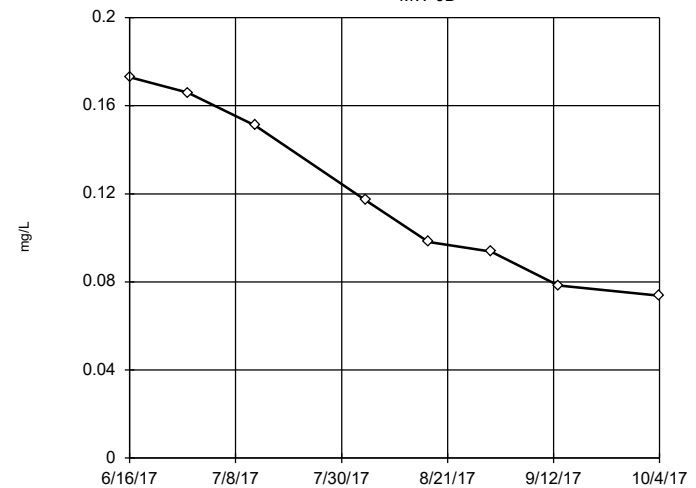


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x\*6 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.1035,  
 low cutoff = -0.0971, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

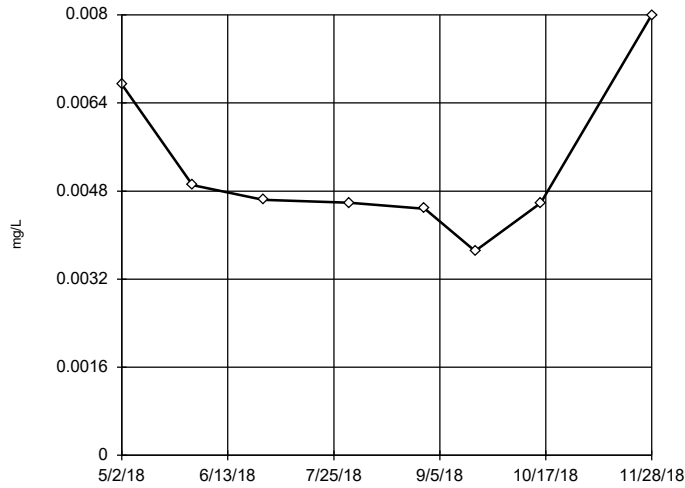
MW-9D



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 = 0.9959,  
 low cutoff = 0.01364, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

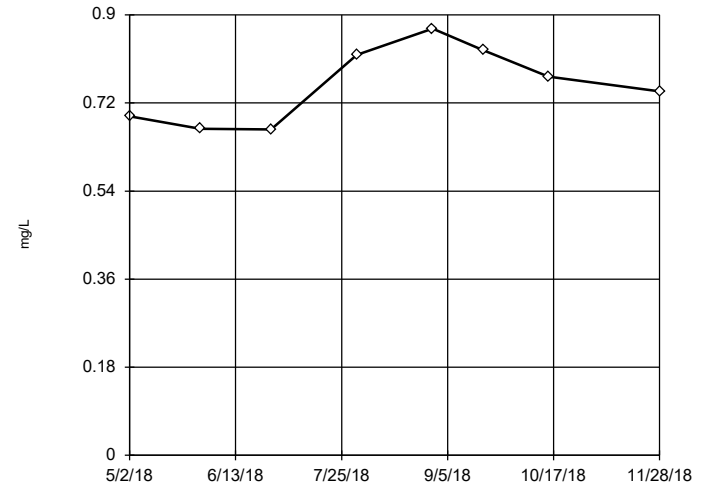
Tukey's Outlier Screening  
MW-4D



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 = 0.01178, low cutoff = 0.002211, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

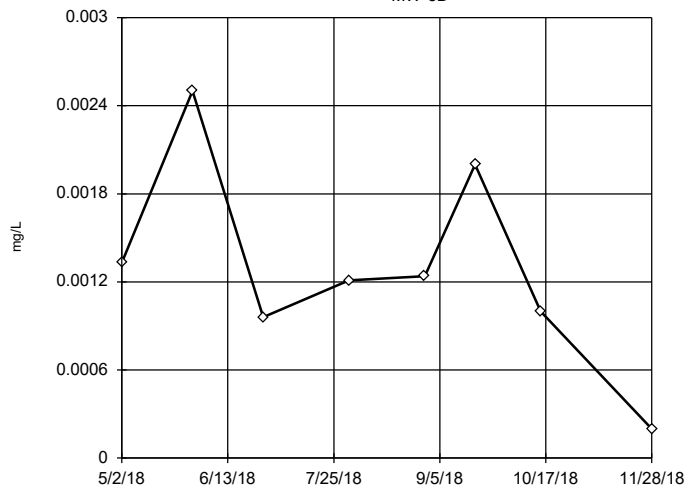
Tukey's Outlier Screening  
MW-12D



n = 8  
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 = 1.15, low cutoff = -0.4264, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

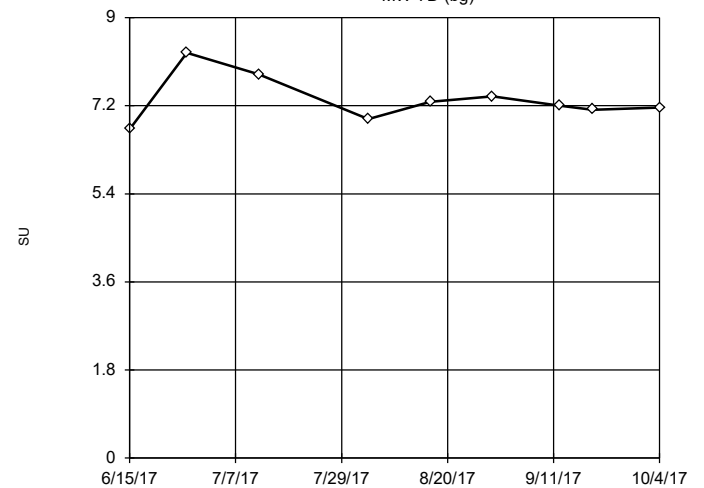
Tukey's Outlier Screening  
MW-5D



n = 8  
No outliers found. Tukey's method selected by user.  
Ladder of Powers transformations did not improve normality; analysis run on raw data.  
High cutoff = 0.00372, low cutoff = -0.001075, based on IQR multiplier of 3.

Constituent: Molybdenum Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

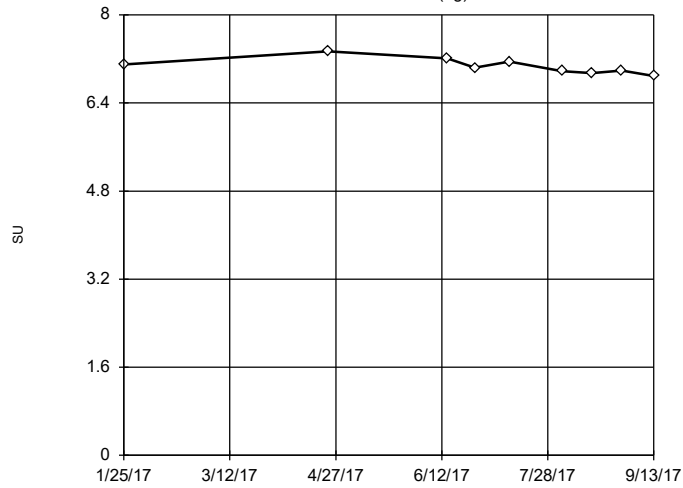
Tukey's Outlier Screening  
MW-7D (bg)



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 = 9.685, low cutoff = 5.521, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

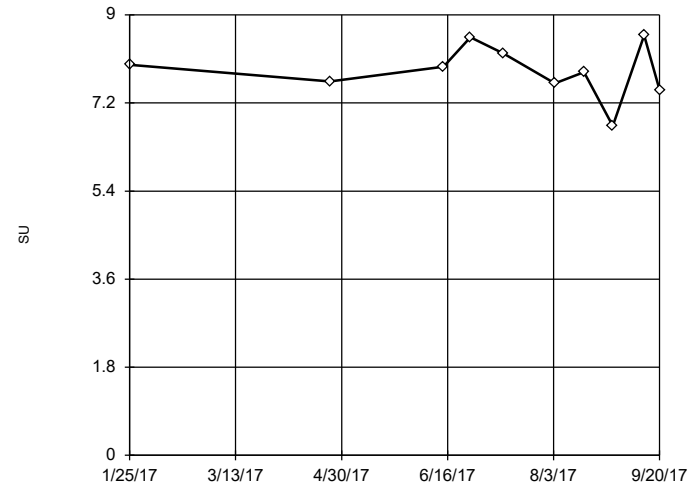
Tukey's Outlier Screening  
MW-8D (bg)



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 = 7.882, low cutoff = 6.34, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

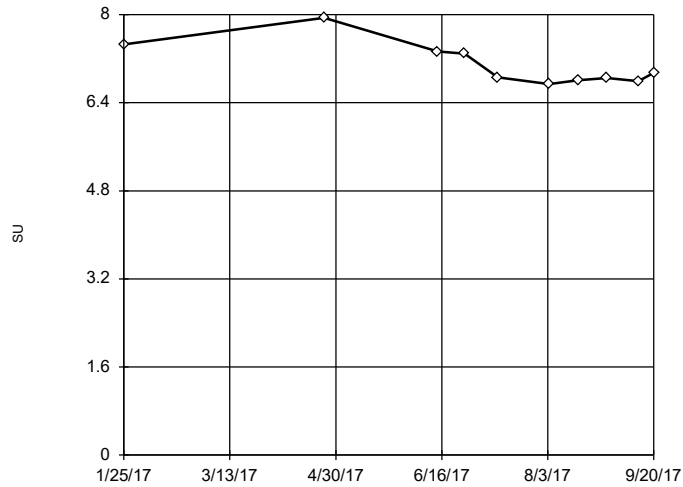
Tukey's Outlier Screening  
MW-15



n = 10  
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 = 10.01, low cutoff = -6.597, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

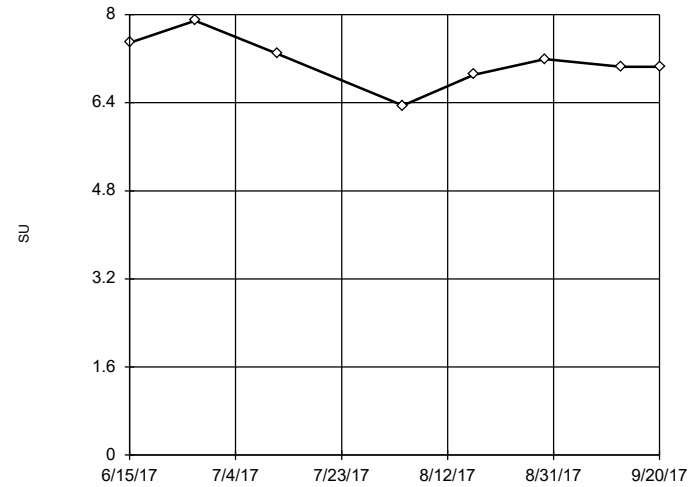
Tukey's Outlier Screening  
MW-3D



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 = 9.51, low cutoff = 5.288, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-6D

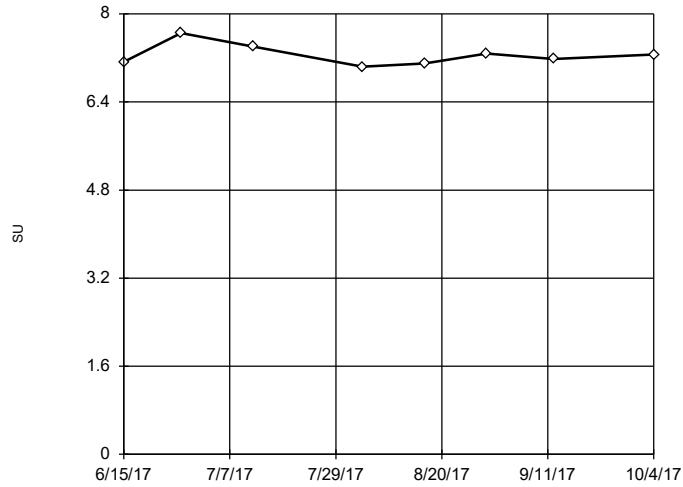


n = 8  
No outliers found. Tukey's method selected by user.  
Data were square transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 8.504, low cutoff = 5.571, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D

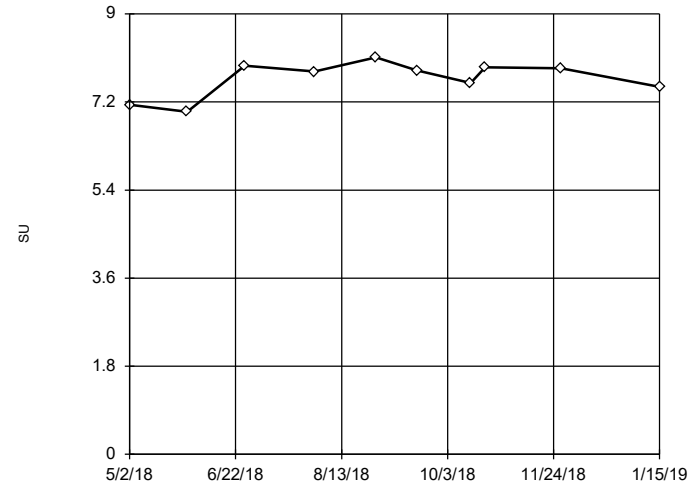


n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 8.079, low cutoff = 6.468, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D

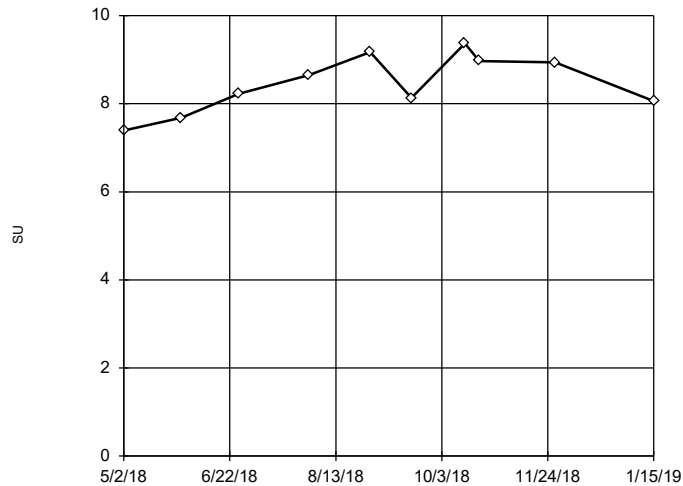


n = 10  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 8.976, low cutoff = -7.018, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-12D

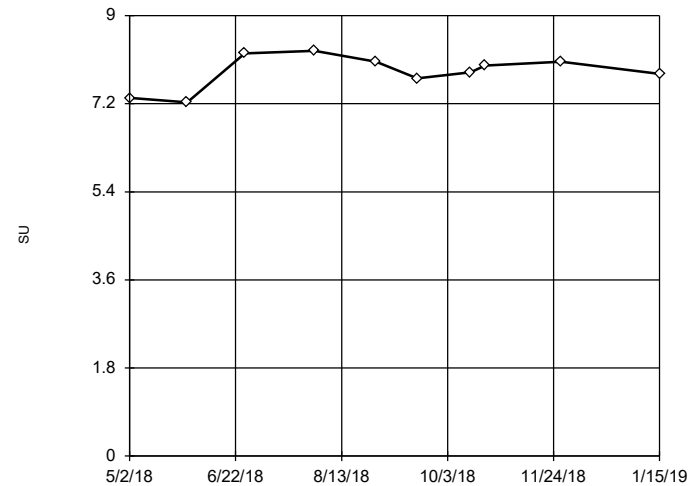


n = 10  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 11.97, low cutoff = 1.033, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-5D



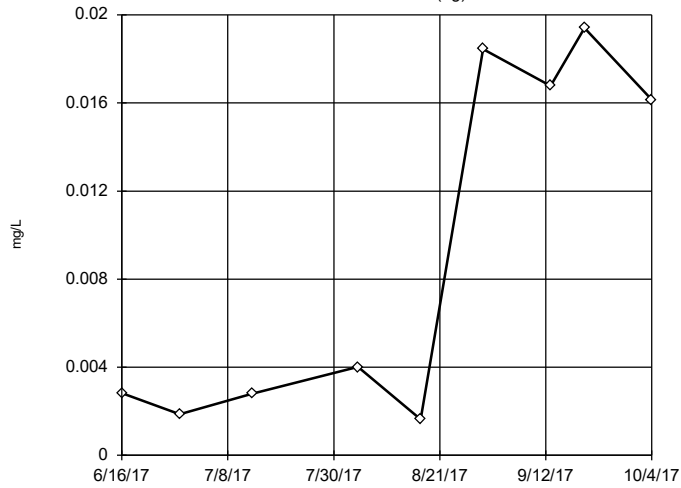
n = 10  
 No outliers found.  
 Tukey's method selected by user.  
 Data were x^6 transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 9.238, low cutoff = -7.259, based on IQR multiplier of 3.

Constituent: pH, field Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF



### Tukey's Outlier Screening

MW-7D (bg)

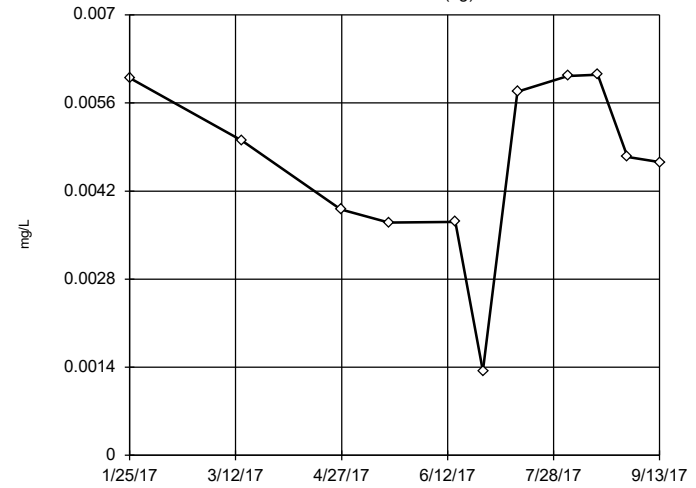


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 7.99, low cutoff = 0.000005037, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

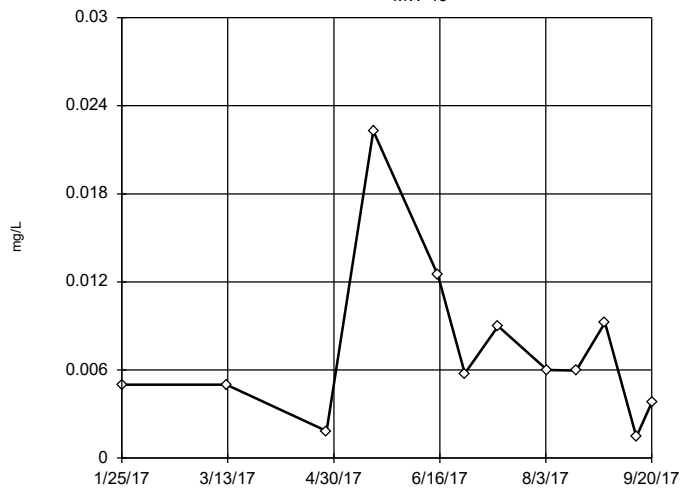


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.01013, low cutoff = -0.007276, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

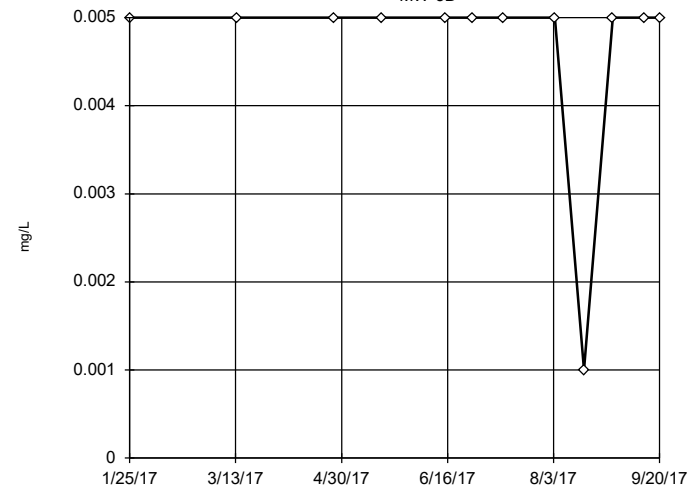


n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0845, low cutoff = 0.0004685, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

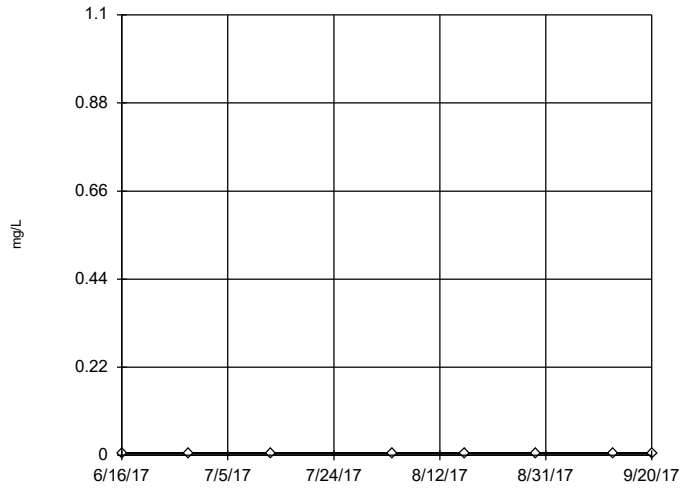
MW-3D



n = 12  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium Analysis Run 7/16/2019 9:45 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

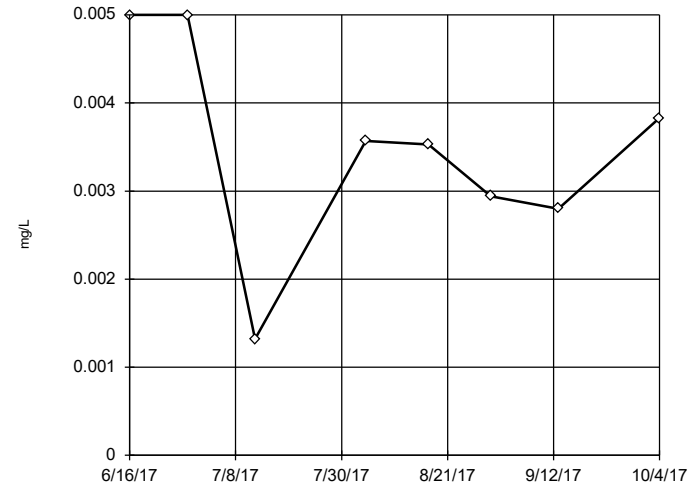
### Tukey's Outlier Screening MW-6D



n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

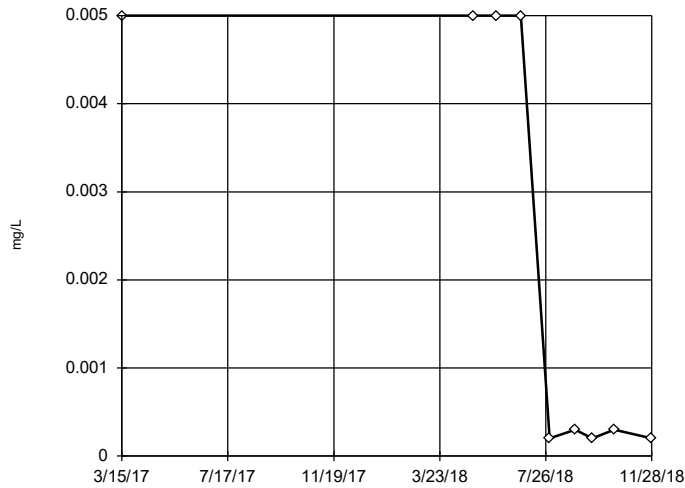
### Tukey's Outlier Screening MW-9D



n = 8  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.00905, low cutoff = -0.001765, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

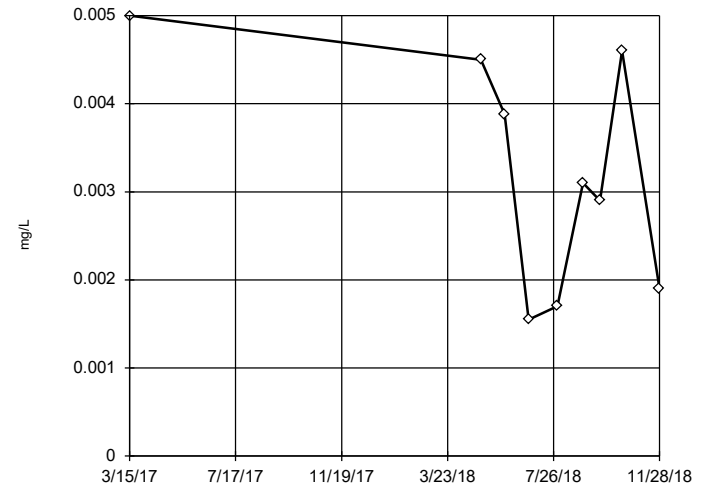
### Tukey's Outlier Screening MW-4D



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 = 78.12, low cutoff = 1.3e-8, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening MW-12D

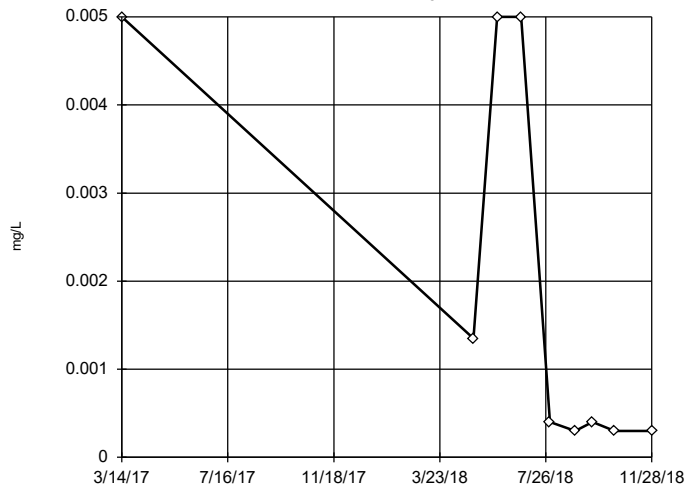


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.0128, low cutoff = -0.00645, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-5D

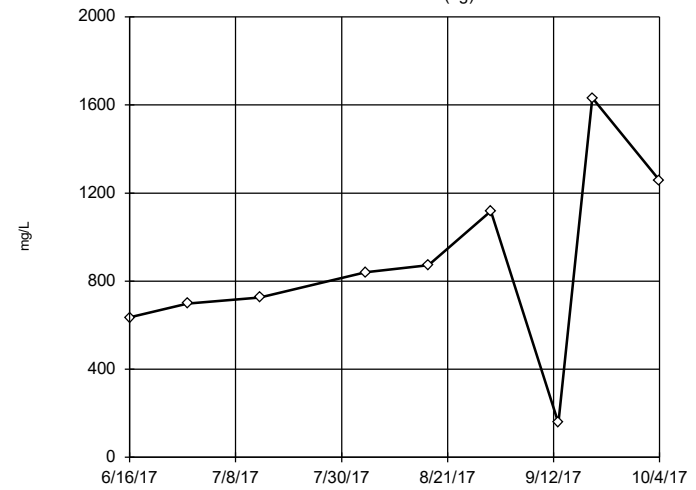


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 23.15, low cutoff = 6.5e-8, based on IQR multiplier of 3.

Constituent: Selenium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-7D (bg)

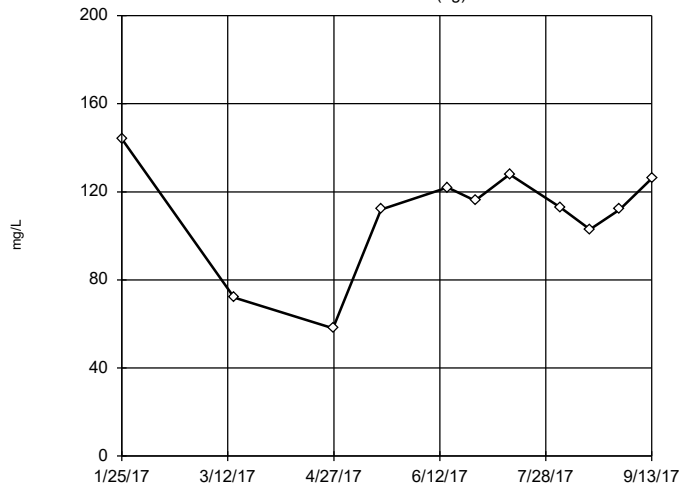


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 2751, low cutoff = -896.5, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-8D (bg)

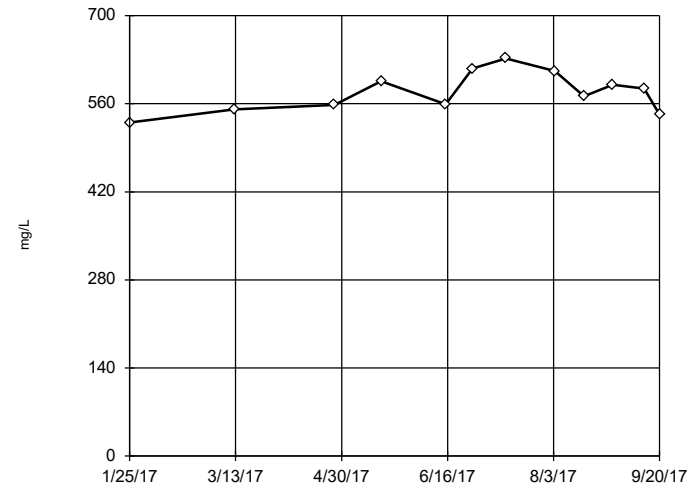


n = 11  
 No outliers found.  
 Tukey's method selected by user.  
 Data were cube transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 167.8, low cutoff = -117.7, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

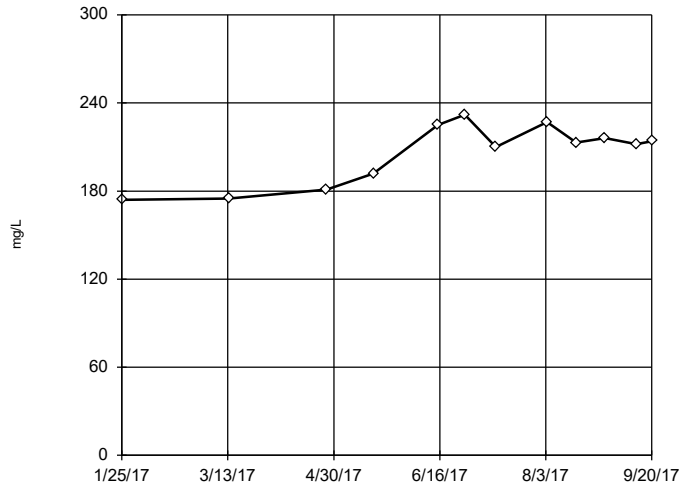
MW-15



n = 12  
 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 = 780.4, low cutoff = 429.1, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

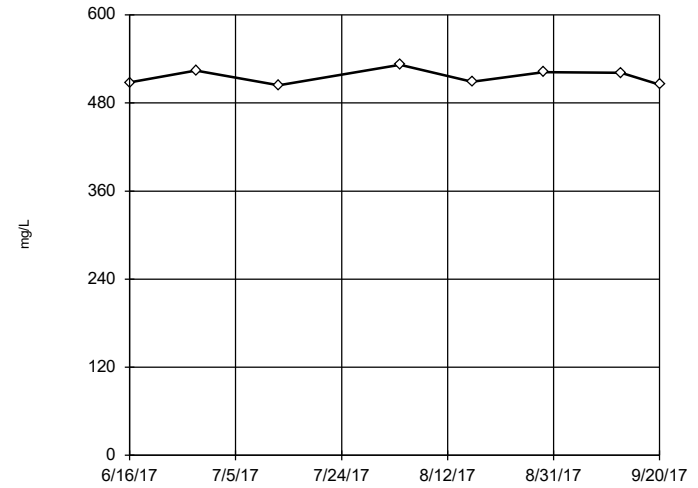
Tukey's Outlier Screening  
MW-3D



n = 12  
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 = 263.5, low cutoff = -236.8, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

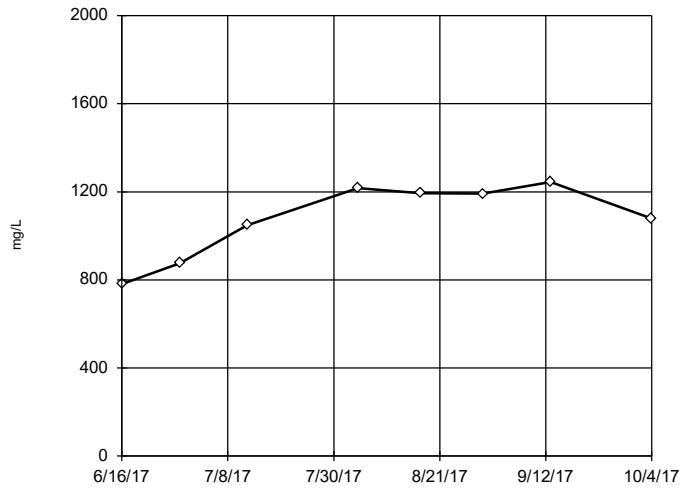
Tukey's Outlier Screening  
MW-6D



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 = 575.8, low cutoff = 460.1, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

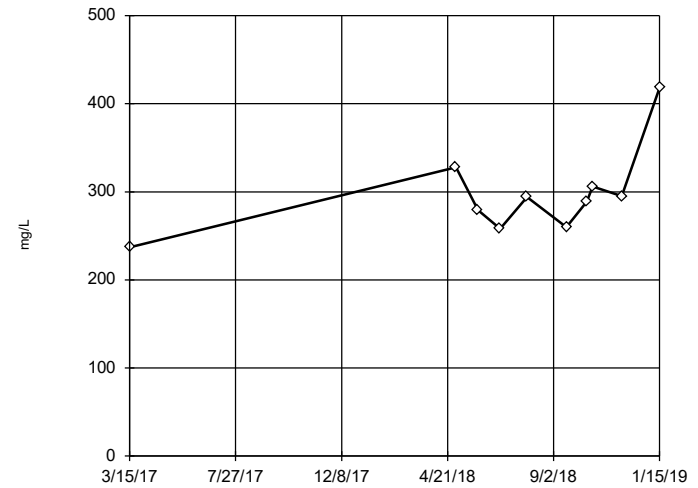
Tukey's Outlier Screening  
MW-9D



n = 8  
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 = 1458, low cutoff = -1334, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

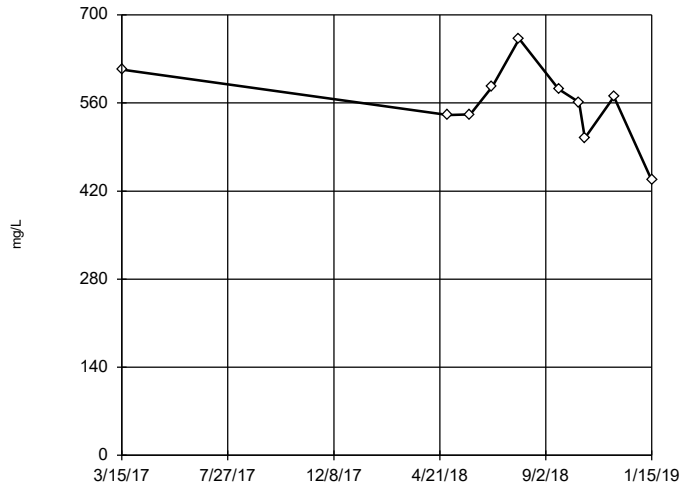
Tukey's Outlier Screening  
MW-4D



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 = 579.8, low cutoff = 141.5, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

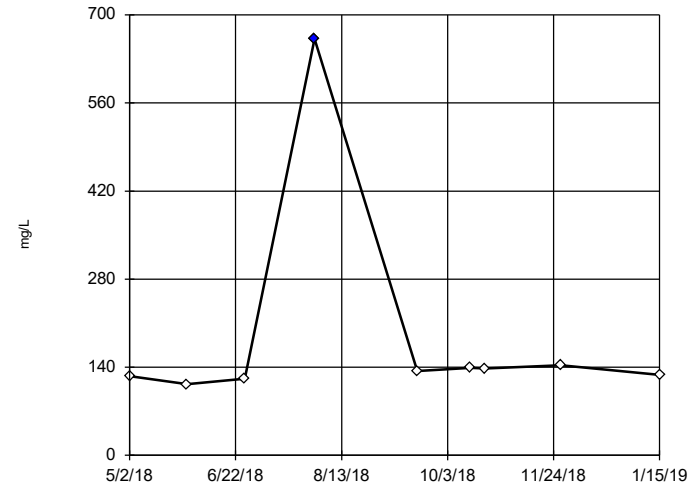
Tukey's Outlier Screening  
MW-12D



n = 10  
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 = 786.3, low cutoff = 121, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

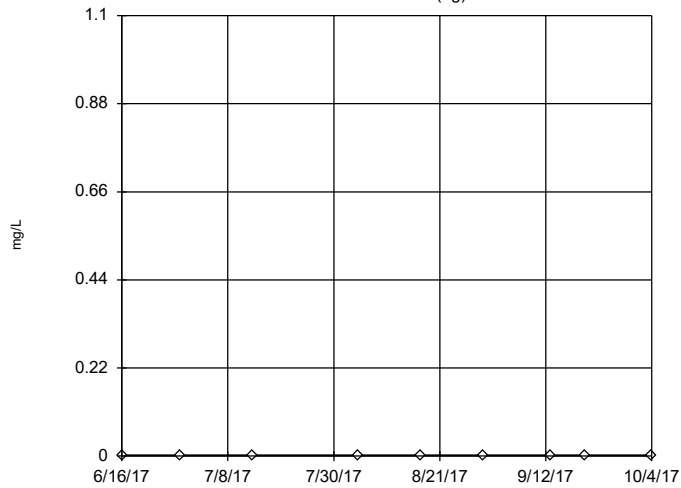
Tukey's Outlier Screening  
MW-5D



n = 9  
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 = 207.3, low cutoff = 84.32, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

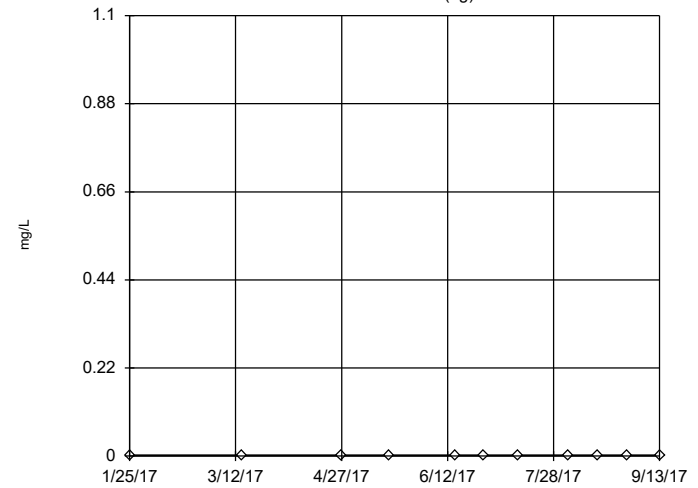
Tukey's Outlier Screening  
MW-7D (bg)



n = 9  
No outliers found. Tukey's method selected by user.  
Data were cube root transformed to achieve best W statistic (graph shown in original units).  
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-8D (bg)

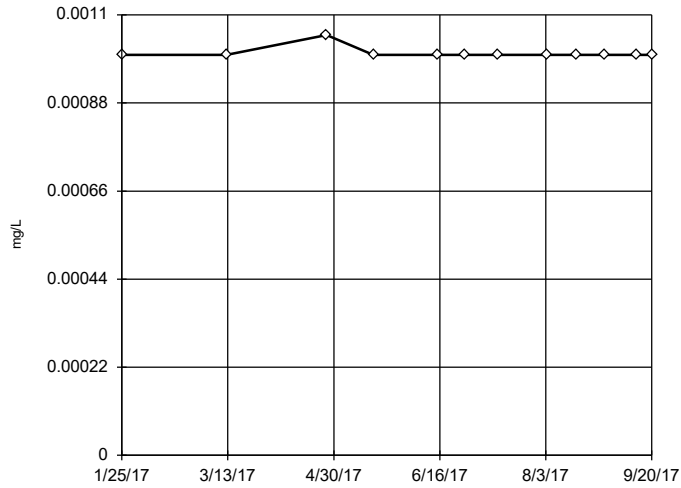


n = 11  
No outliers found. Tukey's method selected by user.  
Data were cube root transformed to achieve best W statistic (graph shown in original units).  
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-15

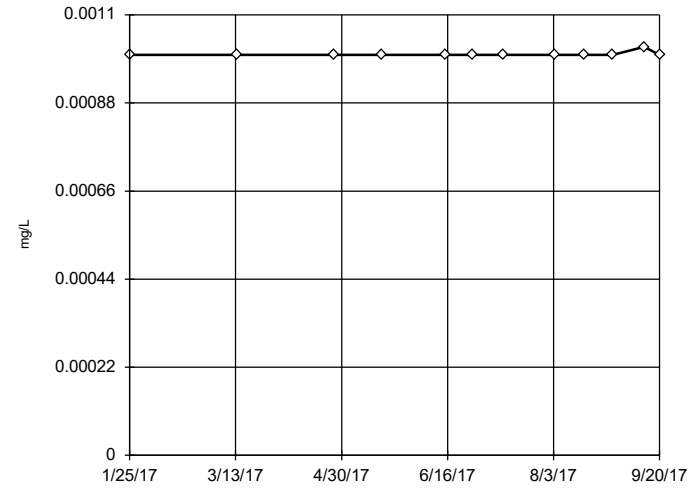


n = 12  
 No outliers found. Tukey's method selected by user.  
 Data were  $x^4$  transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-3D

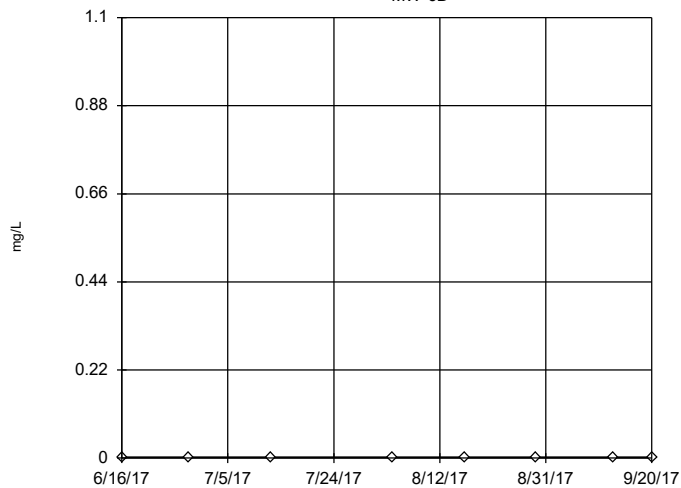


n = 12  
 No outliers found. Tukey's method selected by user.  
 Data were cube transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-6D

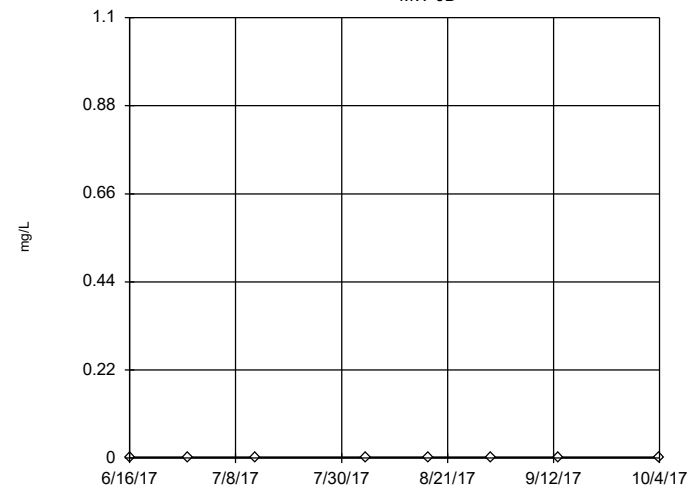


n = 8  
 No outliers found. Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-9D

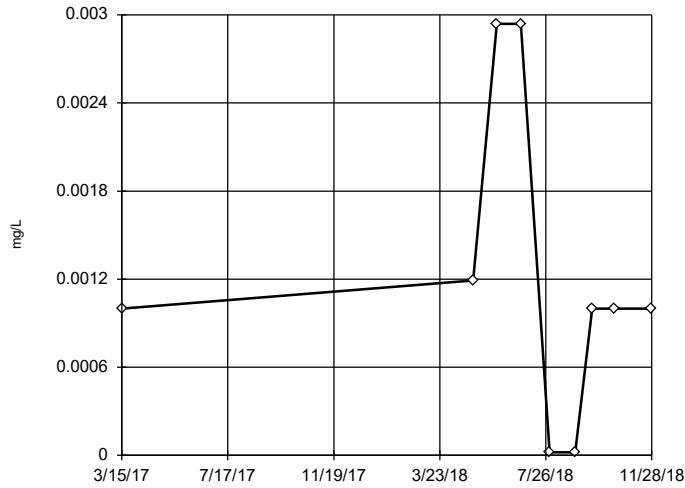


n = 8  
 No outliers found. Tukey's method selected by user.  
 Data were cube root transformed to achieve best W statistic (graph shown in original units).  
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-4D

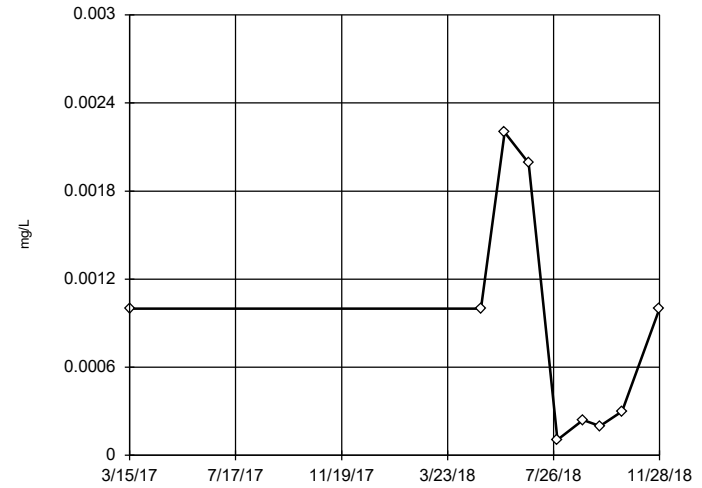


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were square root transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.0152,  
 low cutoff = -0.003707,  
 based on IQR multiplier of 3.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-12D

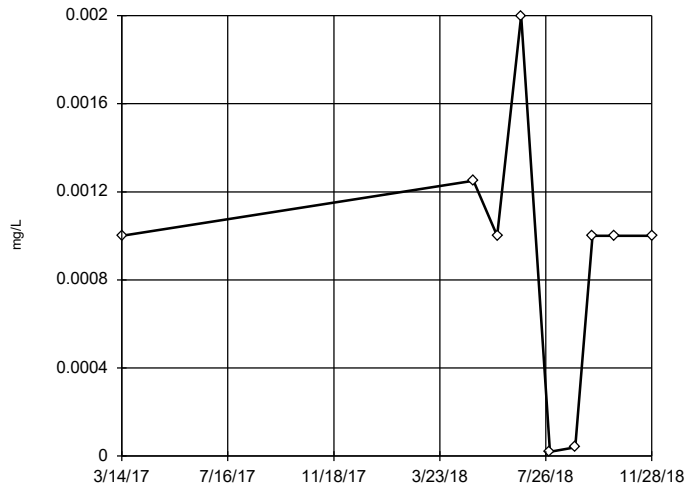


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Data were natural log transformed to achieve best W statistic (graph shown in original units).  
 High cutoff = 0.3742,  
 low cutoff = 8.3e-7,  
 based on IQR multiplier of 3.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

MW-5D

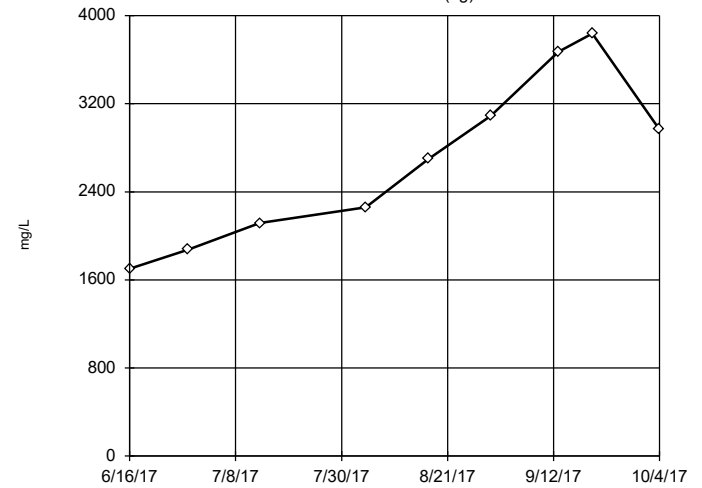


n = 9  
 No outliers found.  
 Tukey's method selected by user.  
 Ladder of Powers transformations did not improve normality; analysis run on raw data.  
 High cutoff = 0.00294,  
 low cutoff = -0.001295,  
 based on IQR multiplier of 3.

Constituent: Thallium Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening

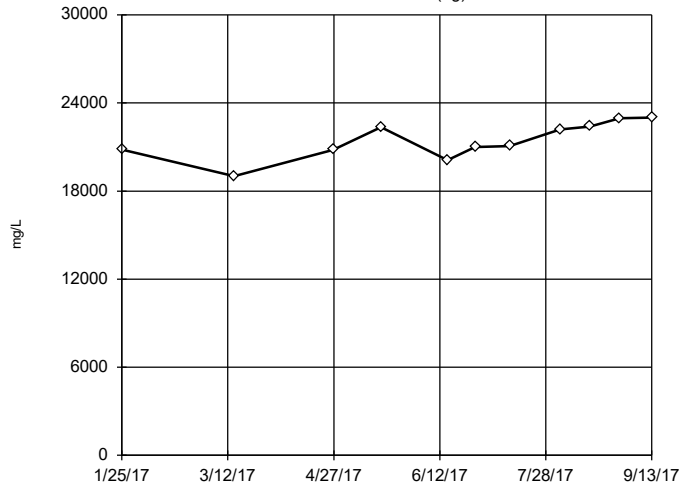
MW-7D (bg)



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 = 16304,  
 low cutoff = 411.4,  
 based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

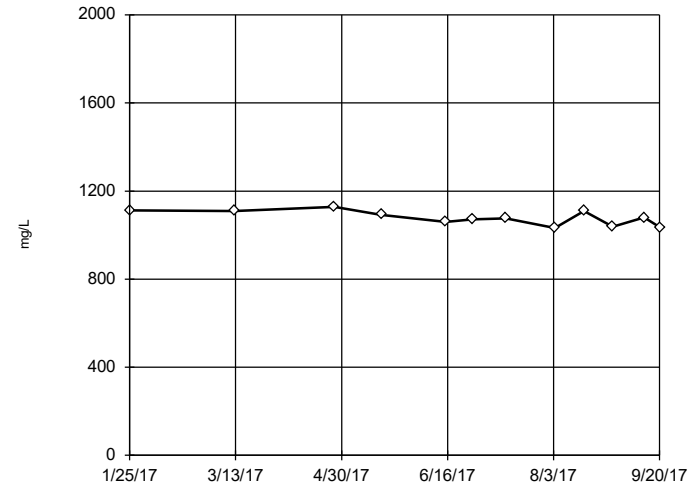
Tukey's Outlier Screening  
MW-8D (bg)



n = 11  
No outliers found. Tukey's method selected by user.  
Data were x<sup>4</sup> transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 25809, low cutoff = -8235, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

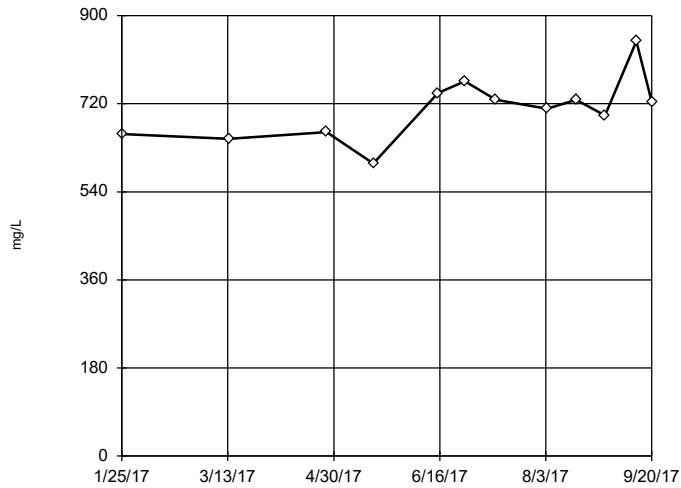
Tukey's Outlier Screening  
MW-15



n = 12  
No outliers found. Tukey's method selected by user.  
Data were x<sup>6</sup> transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 1231, low cutoff = -805.2, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

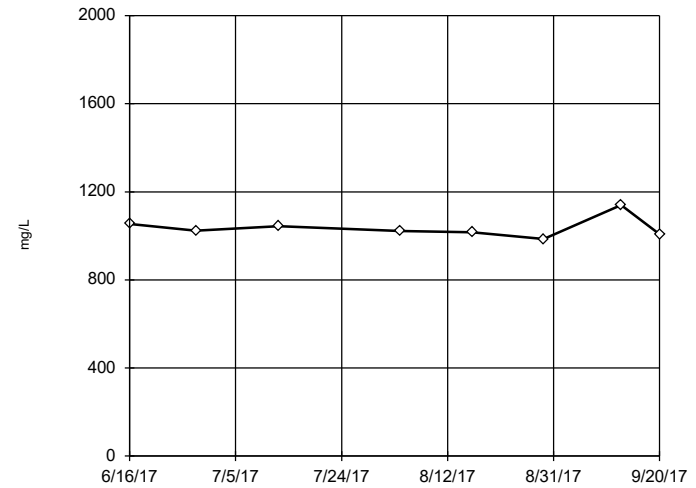
Tukey's Outlier Screening  
MW-3D



n = 12  
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 = 1015, low cutoff = 477.9, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Tukey's Outlier Screening  
MW-6D

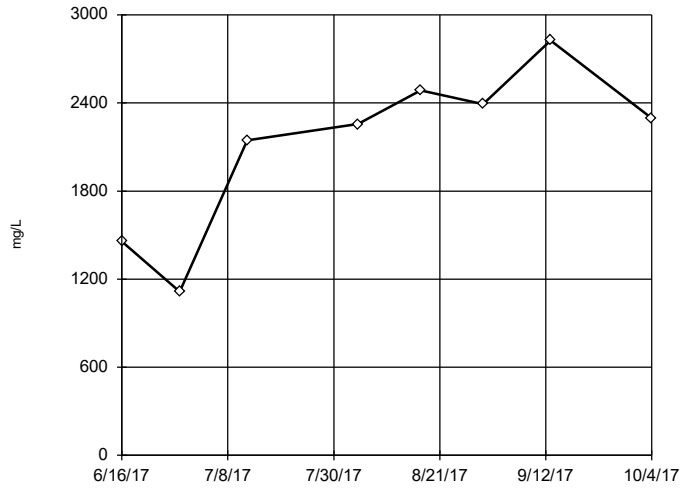


n = 8  
No outliers found. Tukey's method selected by user.  
Data were natural log transformed to achieve best W statistic (graph shown in original units).  
High cutoff = 1168, low cutoff = 908.7, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF



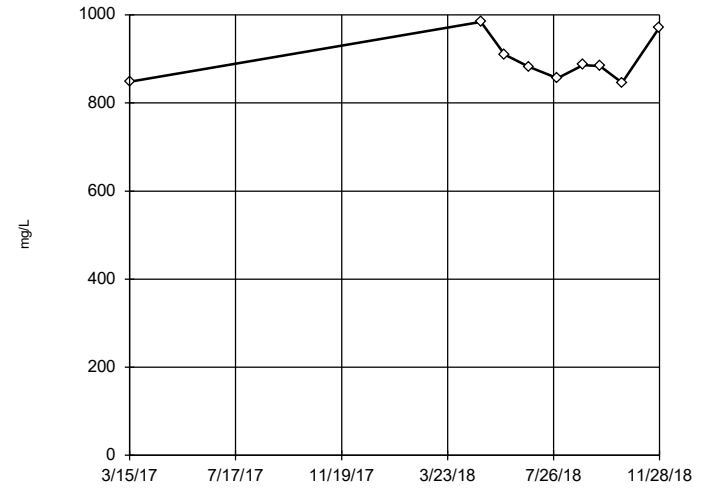
### Tukey's Outlier Screening MW-9D



n = 8  
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 = 3380, low cutoff = -2602, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

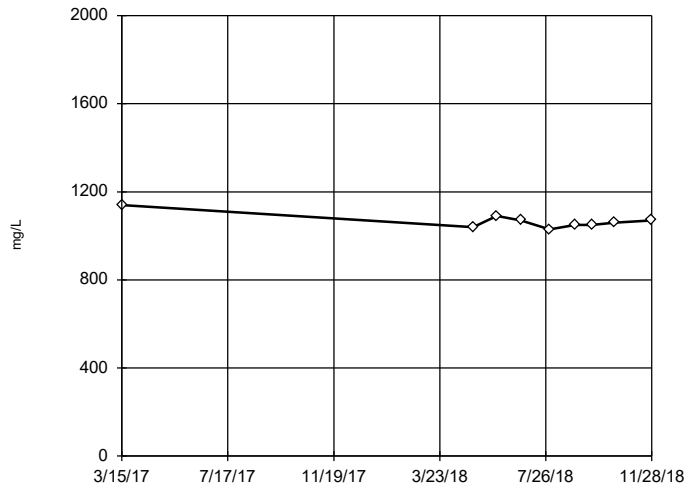
### Tukey's Outlier Screening MW-4D



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 = 1265, low cutoff = 633.4, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

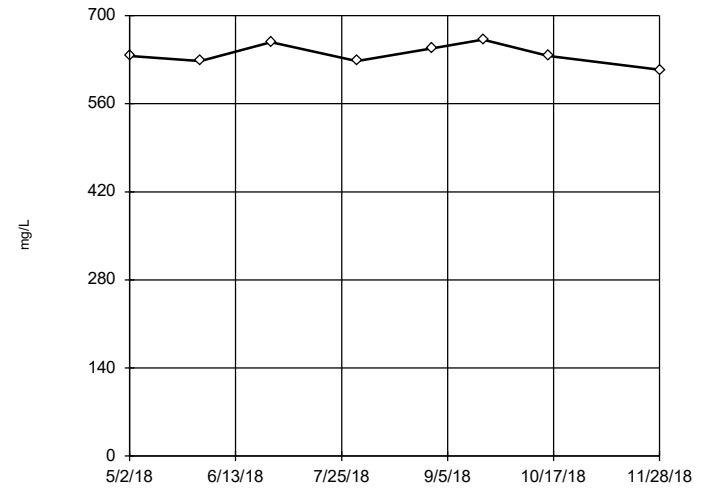
### Tukey's Outlier Screening MW-12D



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 = 1192, low cutoff = 946.7, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Tukey's Outlier Screening MW-5D



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 = 734, low cutoff = 558.6, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/16/2019 9:46 AM View: Time Series  
Northeastern LF Client: Geosyntec Data: Northeastern LF

# Trend Tests Summary Table - Significant Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 1/2/2018, 10:28 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Barium (mg/L)	MW-7D (bg)	2.758	32	25	Yes	9	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-9D	1.295	22	21	Yes	8	0	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-7D (bg)	0.003984	32	25	Yes	9	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-7D (bg)	675.4	30	25	Yes	9	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-15	-26.93	-41	-34	Yes	11	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-3D	-6.518	-38	-34	Yes	11	0	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-7D (bg)	0.1097	30	25	Yes	9	0	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-7D (bg)	0.02943	28	25	Yes	9	0	n/a	n/a	0.01	NP
Lead (mg/L)	MW-7D (bg)	0.04368	34	25	Yes	9	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-15	-0.007242	-42	-38	Yes	12	0	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-9D	-0.3866	-28	-21	Yes	8	0	n/a	n/a	0.01	NP
Total Dissolve Solids [TDS] (mg/L)	MW-7D (bg)	6905	30	25	Yes	9	0	n/a	n/a	0.01	NP
Total Dissolve Solids [TDS] (mg/L)	MW-8D (bg)	6248	39	34	Yes	11	0	n/a	n/a	0.01	NP

# Trend Tests Summary Table - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 1/2/2018, 10:28 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Antimony (mg/L)	MW-7D (bg)	0	-4	-25	No	9	44.44	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-8D (bg)	-0.0008848	-4	-34	No	11	9.091	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-15	0	3	38	No	12	58.33	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-3D	0	-7	-38	No	12	83.33	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-6D	0	-6	-21	No	8	62.5	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-9D	0	0	21	No	8	100	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-7D (bg)	0.01562	12	25	No	9	0	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-8D (bg)	0.001884	3	34	No	11	9.091	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-15	-0.001524	-13	-38	No	12	16.67	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-3D	-0.001668	-21	-38	No	12	50	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-6D	-0.004025	-9	-21	No	8	37.5	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-9D	0	0	21	No	8	100	n/a	n/a	0.01	NP
<b>Barium (mg/L)</b>	<b>MW-7D (bg)</b>	<b>2.758</b>	<b>32</b>	<b>25</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Barium (mg/L)	MW-8D (bg)	3.65	15	34	No	11	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-15	-0.07315	-22	-38	No	12	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-3D	0.3013	28	38	No	12	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-6D	-0.1567	-14	-21	No	8	0	n/a	n/a	0.01	NP
<b>Barium (mg/L)</b>	<b>MW-9D</b>	<b>1.295</b>	<b>22</b>	<b>21</b>	<b>Yes</b>	<b>8</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Beryllium (mg/L)</b>	<b>MW-7D (bg)</b>	<b>0.003984</b>	<b>32</b>	<b>25</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Beryllium (mg/L)	MW-8D (bg)	-0.0004205	-6	-34	No	11	18.18	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-15	-0.000982	-30	-38	No	12	41.67	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-3D	-0.001158	-20	-38	No	12	25	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-6D	0.0002463	7	21	No	8	0	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-9D	0.0007039	10	21	No	8	12.5	n/a	n/a	0.01	NP
Boron (mg/L)	MW-7D (bg)	-1.397	-24	-25	No	9	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-8D (bg)	0.1352	30	34	No	11	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-15	0.05173	0	38	No	12	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-3D	-0.1204	-23	-34	No	11	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-6D	0.797	4	21	No	8	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-9D	-1.731	-16	-21	No	8	0	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-7D (bg)	0.004366	17	25	No	9	11.11	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-8D (bg)	0.0006978	3	34	No	11	0	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-15	0	1	38	No	12	66.67	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-3D	-0.0009236	-24	-38	No	12	16.67	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-6D	-0.00166	-12	-21	No	8	0	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-9D	0.002329	6	21	No	8	12.5	n/a	n/a	0.01	NP
<b>Calcium (mg/L)</b>	<b>MW-7D (bg)</b>	<b>675.4</b>	<b>30</b>	<b>25</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Calcium (mg/L)	MW-8D (bg)	124.3	10	34	No	11	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-15	-29.89	-16	-38	No	12	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-3D	44.4	26	38	No	12	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-6D	62.62	4	21	No	8	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-9D	537.8	16	21	No	8	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-7D (bg)	1721	18	25	No	9	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-8D (bg)	568.5	5	34	No	11	0	n/a	n/a	0.01	NP
<b>Chloride (mg/L)</b>	<b>MW-15</b>	<b>-26.93</b>	<b>-41</b>	<b>-34</b>	<b>Yes</b>	<b>11</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Chloride (mg/L)</b>	<b>MW-3D</b>	<b>-6.518</b>	<b>-38</b>	<b>-34</b>	<b>Yes</b>	<b>11</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Chloride (mg/L)	MW-6D	12.4	20	21	No	8	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-9D	160.8	2	21	No	8	0	n/a	n/a	0.01	NP
<b>Chromium (mg/L)</b>	<b>MW-7D (bg)</b>	<b>0.1097</b>	<b>30</b>	<b>25</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Chromium (mg/L)	MW-8D (bg)	0.002444	12	34	No	11	18.18	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-15	-0.003672	-16	-38	No	12	8.333	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-3D	0.00314	14	38	No	12	8.333	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-6D	0.004402	6	21	No	8	0	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-9D	0.0501	16	21	No	8	0	n/a	n/a	0.01	NP
<b>Cobalt (mg/L)</b>	<b>MW-7D (bg)</b>	<b>0.02943</b>	<b>28</b>	<b>25</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>

# Trend Tests Summary Table - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 1/2/2018, 10:28 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Cobalt (mg/L)	MW-8D (bg)	0	0	34	No	11	18.18	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-15	-0.006205	-23	-38	No	12	16.67	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-3D	-0.00392	-15	-38	No	12	16.67	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-6D	-0.00297	-8	-21	No	8	0	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-9D	0.01751	18	21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-7D (bg)	-0.7352	-4	-21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-8D (bg)	2.841	8	21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-15	-0.09224	-4	-38	No	12	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-3D	0.1043	3	34	No	11	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-6D	-1.969	-10	-21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-9D	4.147	NaN	NaN	No	3	0	n/a	n/a	NaN	NP
Fluoride (mg/L)	MW-7D (bg)	3.568	14	25	No	9	11.11	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-8D (bg)	0	6	34	No	11	90.91	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-15	-0.6635	-35	-38	No	12	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-3D	0	-7	-38	No	12	50	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-6D	-0.4033	-9	-21	No	8	25	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-9D	-1.691	-5	-21	No	8	25	n/a	n/a	0.01	NP
<b>Lead (mg/L)</b>	<b>MW-7D (bg)</b>	<b>0.04368</b>	<b>34</b>	<b>25</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Lead (mg/L)	MW-8D (bg)	-0.002385	-4	-34	No	11	18.18	n/a	n/a	0.01	NP
Lead (mg/L)	MW-15	0	-5	-38	No	12	50	n/a	n/a	0.01	NP
Lead (mg/L)	MW-3D	0	-7	-38	No	12	58.33	n/a	n/a	0.01	NP
Lead (mg/L)	MW-6D	-0.003664	-8	-21	No	8	0	n/a	n/a	0.01	NP
Lead (mg/L)	MW-9D	0.03008	18	21	No	8	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-7D (bg)	0.2229	19	25	No	9	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-8D (bg)	-0.05141	-2	-34	No	11	0	n/a	n/a	0.01	NP
<b>Lithium (mg/L)</b>	<b>MW-15</b>	<b>-0.007242</b>	<b>-42</b>	<b>-38</b>	<b>Yes</b>	<b>12</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Lithium (mg/L)	MW-3D	-0.00293	-15	-38	No	12	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-6D	-0.01464	-6	-21	No	8	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-9D	0.05519	18	21	No	8	0	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-7D (bg)	0.00008047	18	25	No	9	11.11	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-8D (bg)	0.0000869	14	34	No	11	27.27	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-15	-0.00001855	-33	-38	No	12	33.33	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-3D	0	4	38	No	12	75	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-6D	0.00004557	10	21	No	8	50	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-9D	-0.0000112	-6	-21	No	8	25	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-7D (bg)	0.06326	24	25	No	9	0	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-8D (bg)	0.0002808	2	34	No	11	18.18	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-15	0.05851	18	38	No	12	0	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-3D	-0.003103	-20	-34	No	11	18.18	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-6D	0.00008302	0	21	No	8	0	n/a	n/a	0.01	NP
<b>Molybdenum (mg/L)</b>	<b>MW-9D</b>	<b>-0.3866</b>	<b>-28</b>	<b>-21</b>	<b>Yes</b>	<b>8</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
pH, field (SU)	MW-7D (bg)	-1.4	-6	-25	No	9	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-8D (bg)	-0.8495	-24	-25	No	9	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-15	-0.6373	-9	-30	No	10	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-3D	-1.376	-25	-30	No	10	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-6D	-1.72	-11	-21	No	8	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-9D	-0.1912	-2	-21	No	8	0	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-7D (bg)	0.05794	16	25	No	9	0	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-8D (bg)	0.00008946	3	34	No	11	9.091	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-15	-0.001645	-5	-38	No	12	16.67	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-3D	0	-5	-38	No	12	91.67	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-6D	0	0	21	No	8	100	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-9D	-0.005692	-9	-21	No	8	12.5	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-7D (bg)	1994	22	25	No	9	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-8D (bg)	16.4	4	34	No	11	0	n/a	n/a	0.01	NP

# Trend Tests Summary Table - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 1/2/2018, 10:28 PM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Sulfate (mg/L)	MW-15	66.87	14	38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-3D	70.21	30	38	No	12	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-6D	-11.5	-2	-21	No	8	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-9D	1246	14	21	No	8	0	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-7D (bg)	0	0	25	No	9	100	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-8D (bg)	0	0	34	No	11	100	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-15	0	7	38	No	12	91.67	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-3D	0	-9	-38	No	12	91.67	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-6D	0	0	21	No	8	100	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-9D	0	0	21	No	8	100	n/a	n/a	0.01	NP
<b>Total Dissolve Solids [TDS] (mg/L)</b>	<b>MW-7D (bg)</b>	<b>6905</b>	<b>30</b>	<b>25</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Total Dissolve Solids [TDS] (mg/L)</b>	<b>MW-8D (bg)</b>	<b>6248</b>	<b>39</b>	<b>34</b>	<b>Yes</b>	<b>11</b>	<b>0</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Total Dissolve Solids [TDS] (mg/L)	MW-15	-111.8	-31	-38	No	12	0	n/a	n/a	0.01	NP
Total Dissolve Solids [TDS] (mg/L)	MW-3D	153.5	23	38	No	12	0	n/a	n/a	0.01	NP
Total Dissolve Solids [TDS] (mg/L)	MW-6D	-135.2	-7	-18	No	7	0	n/a	n/a	0.01	NP
Total Dissolve Solids [TDS] (mg/L)	MW-9D	4474	18	21	No	8	0	n/a	n/a	0.01	NP

# Trend Test Summary Table - New Wells Significant Results

Northeastern LF   Client: Geosyntec   Data: Northeastern LF   Printed 3/6/2019, 10:05 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
<b>Cadmium (mg/L)</b>	<b>MW-5D</b>	<b>-0.0006039</b>	<b>-29</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>33.33</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Cobalt (mg/L)</b>	<b>MW-5D</b>	<b>-0.001422</b>	<b>-28</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>11.11</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>

# Trend Test Summary Table - New Wells All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 3/6/2019, 10:05 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Antimony (mg/L)	MW-4D	-0.0002888	-12	-25	No	9	44.44	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-12D	-0.002972	-14	-25	No	9	44.44	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-5D	-0.0005811	-17	-25	No	9	33.33	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-4D	-0.002245	-17	-25	No	9	22.22	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-12D	0.004484	9	25	No	9	22.22	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-5D	-0.001798	-19	-25	No	9	33.33	n/a	n/a	0.01	NP
Barium (mg/L)	MW-4D	-0.001659	-2	-21	No	8	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-12D	0.01387	6	25	No	9	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-5D	-0.0252	-6	-25	No	9	0	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-4D	0	-8	-25	No	9	55.56	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-12D	-0.0003029	-14	-25	No	9	33.33	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-5D	-0.0001632	-16	-25	No	9	55.56	n/a	n/a	0.01	NP
Boron (mg/L)	MW-4D	-0.1057	-9	-25	No	9	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-12D	1.148	18	25	No	9	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-5D	0.1092	10	25	No	9	0	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-4D	-0.0004675	-15	-25	No	9	33.33	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-12D	-0.0004574	-10	-25	No	9	22.22	n/a	n/a	0.01	NP
<b>Cadmium (mg/L)</b>	<b>MW-5D</b>	<b>-0.0006039</b>	<b>-29</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>33.33</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Calcium (mg/L)	MW-4D	-8.826	-4	-30	No	10	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-12D	-15.21	-11	-30	No	10	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-5D	19.12	29	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-4D	8.132	13	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-12D	-1.25	-5	-25	No	9	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5D	1.14	6	25	No	9	0	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-4D	-0.002411	-17	-25	No	9	22.22	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-12D	-0.0004559	-3	-25	No	9	22.22	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-5D	-0.0003455	-16	-25	No	9	11.11	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-4D	-0.001361	-20	-25	No	9	11.11	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-12D	-0.000945	-12	-25	No	9	11.11	n/a	n/a	0.01	NP
<b>Cobalt (mg/L)</b>	<b>MW-5D</b>	<b>-0.001422</b>	<b>-28</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>11.11</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Combined Radium 226 + 228 (pCi/L)	MW-4D	0.6447	3	21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-12D	2.756	8	21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-5D	1.995	8	21	No	8	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-4D	0	-12	-30	No	10	70	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-12D	0.3145	11	30	No	10	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-5D	-0.233	-2	-25	No	9	0	n/a	n/a	0.01	NP
Lead (mg/L)	MW-4D	-0.002517	-17	-25	No	9	33.33	n/a	n/a	0.01	NP
Lead (mg/L)	MW-12D	-0.001281	-5	-25	No	9	22.22	n/a	n/a	0.01	NP
Lead (mg/L)	MW-5D	-0.002233	-21	-25	No	9	22.22	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-4D	-0.001623	-8	-21	No	8	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-12D	-0.007833	-18	-21	No	8	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-5D	-0.004334	-13	-21	No	8	0	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-4D	0	-2	-25	No	9	88.89	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-12D	-0.00001049	-17	-25	No	9	55.56	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-5D	0	-2	-25	No	9	88.89	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-4D	-0.001125	-10	-21	No	8	0	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-12D	0.1663	6	21	No	8	0	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-5D	-0.001715	-10	-21	No	8	12.5	n/a	n/a	0.01	NP
pH, field (SU)	MW-4D	0.2607	5	30	No	10	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-12D	1.929	15	30	No	10	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-5D	0.5368	4	30	No	10	0	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-4D	-0.003066	-20	-25	No	9	44.44	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-12D	-0.001601	-10	-25	No	9	11.11	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-5D	-0.002613	-23	-25	No	9	33.33	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-4D	42.98	21	30	No	10	0	n/a	n/a	0.01	NP

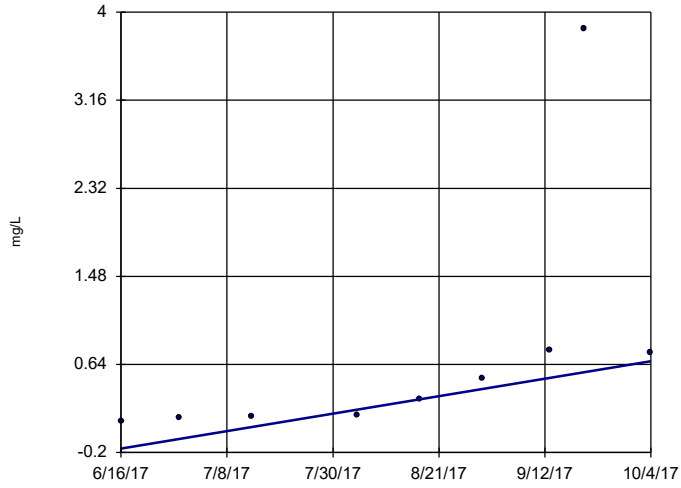
# Trend Test Summary Table - New Wells All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Sulfate (mg/L)	MW-12D	-60.67	-14	-25	No	9	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-5D	29.07	12	25	No	9	0	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-4D	0	-2	-25	No	9	44.44	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-12D	-0.0005747	-9	-25	No	9	33.33	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-5D	0	3	25	No	9	55.56	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-4D	-11.06	-2	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-12D	-36.65	-4	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-5D	-14.04	-2	-21	No	8	0	n/a	n/a	0.01	NP



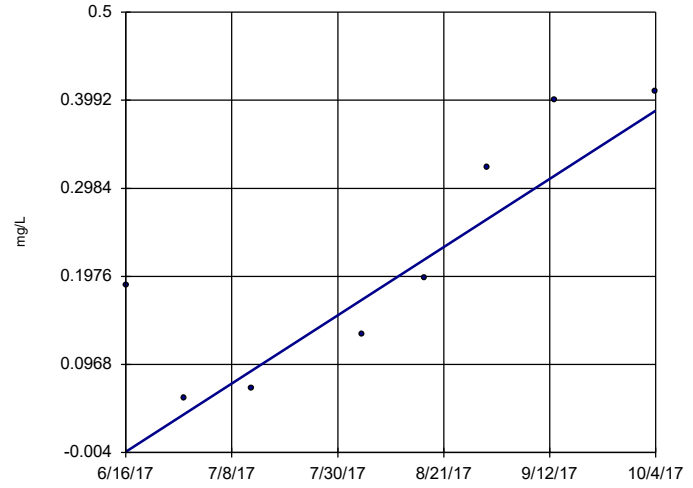
Sen's Slope Estimator  
MW-7D (bg)



n = 9  
Slope = 2.758 units per year.  
Mann-Kendall statistic = 32  
critical = 25  
Increasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Barium Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

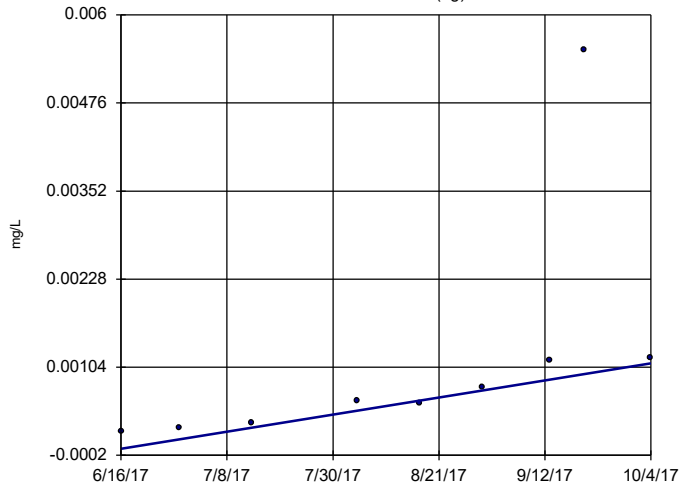
Sen's Slope Estimator  
MW-9D



n = 8  
Slope = 1.295 units per year.  
Mann-Kendall statistic = 22  
critical = 21  
Increasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Barium Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

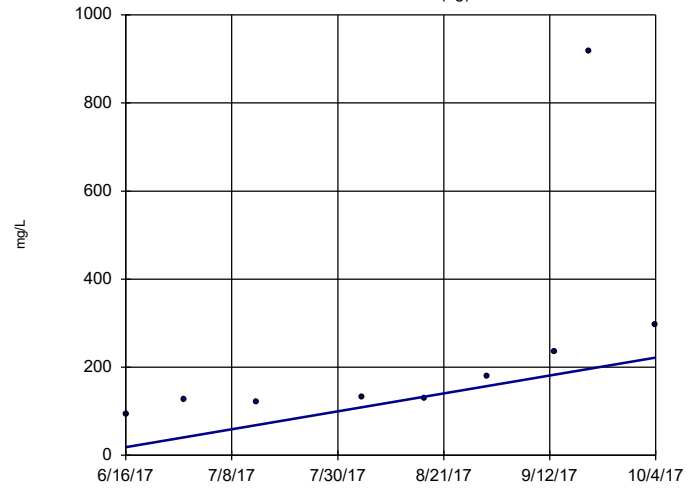
Sen's Slope Estimator  
MW-7D (bg)



n = 9  
Slope = 0.003984 units per year.  
Mann-Kendall statistic = 32  
critical = 25  
Increasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Beryllium Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator  
MW-7D (bg)

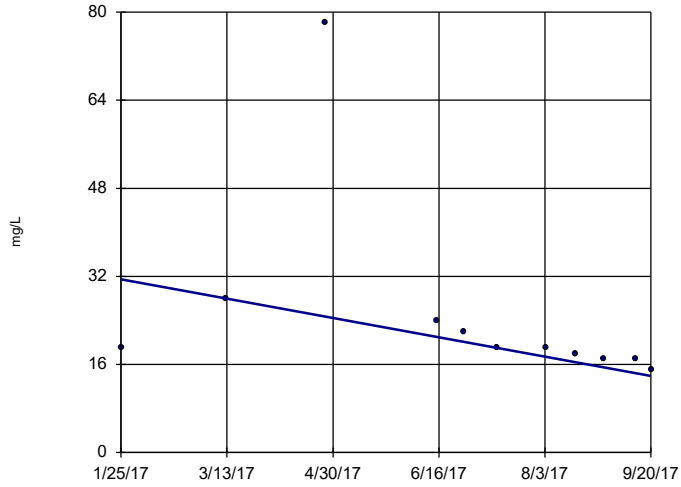


n = 9  
Slope = 675.4 units per year.  
Mann-Kendall statistic = 30  
critical = 25  
Increasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Calcium Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-15

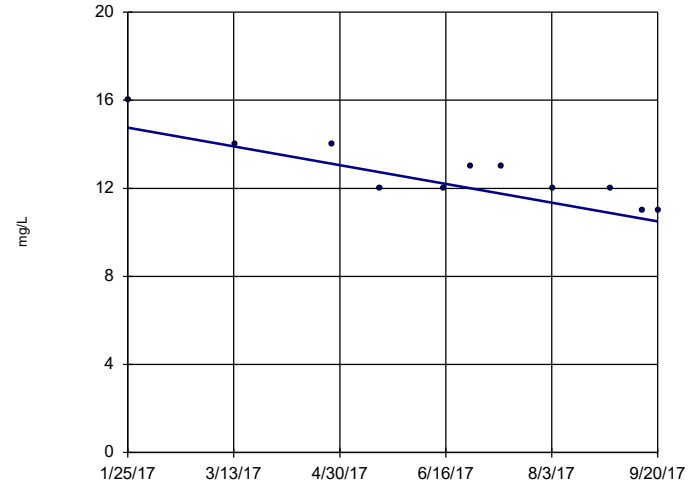


n = 11  
 Slope = -26.93  
 units per year.  
 Mann-Kendall  
 statistic = -41  
 critical = -34  
 Decreasing trend  
 significant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Chloride Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-3D

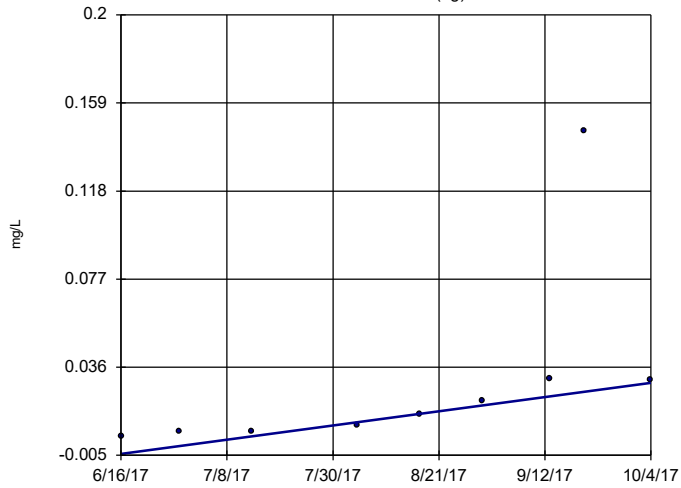


n = 11  
 Slope = -6.518  
 units per year.  
 Mann-Kendall  
 statistic = -38  
 critical = -34  
 Decreasing trend  
 significant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Chloride Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-7D (bg)

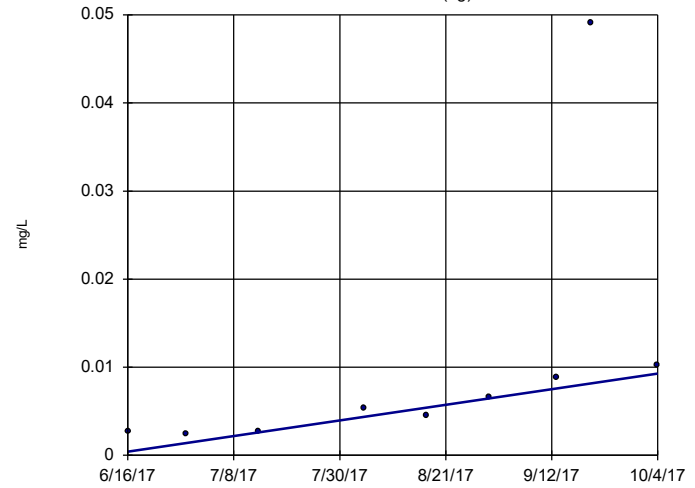


n = 9  
 Slope = 0.1097  
 units per year.  
 Mann-Kendall  
 statistic = 30  
 critical = 25  
 Increasing trend  
 significant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Chromium Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

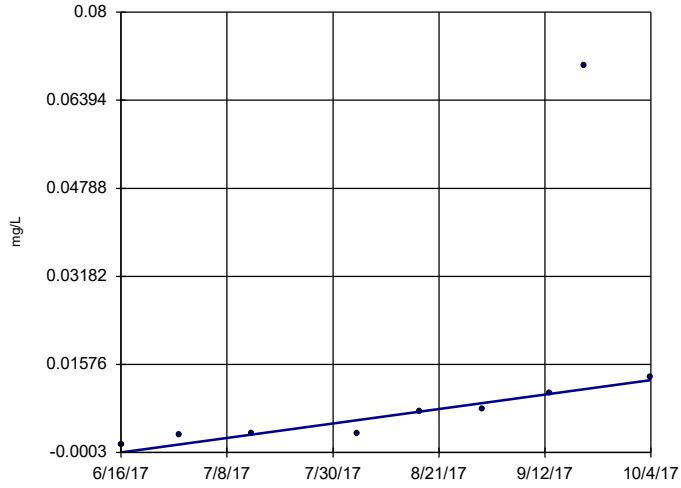
MW-7D (bg)



n = 9  
 Slope = 0.02943  
 units per year.  
 Mann-Kendall  
 statistic = 28  
 critical = 25  
 Increasing trend  
 significant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Cobalt Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

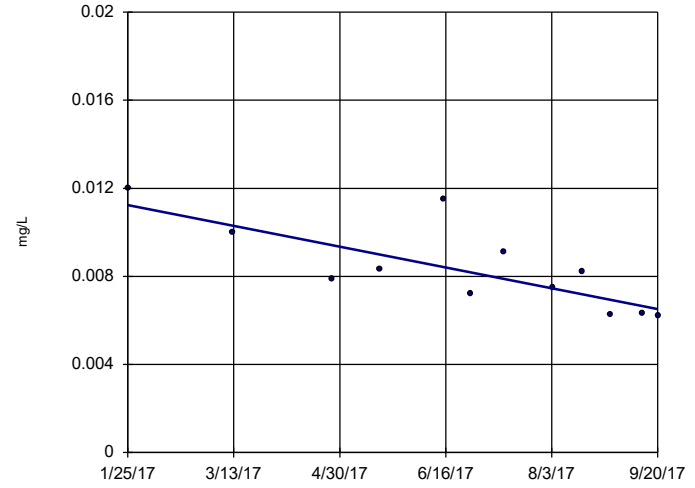
Sen's Slope Estimator  
MW-7D (bg)



n = 9  
Slope = 0.04368 units per year.  
Mann-Kendall statistic = 34  
critical = 25  
Increasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Lead Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

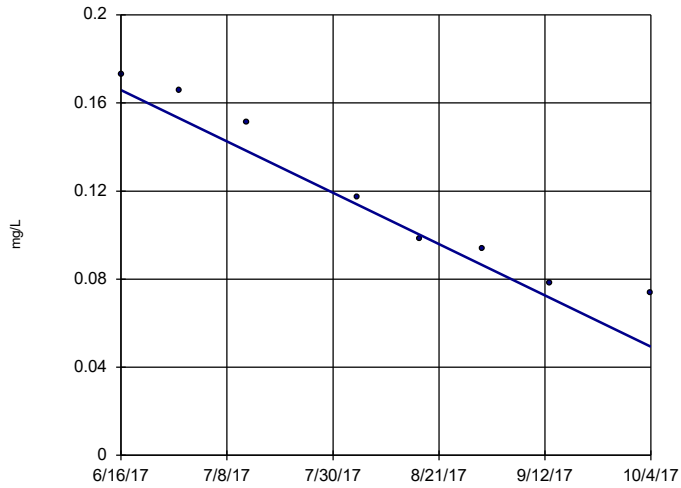
Sen's Slope Estimator  
MW-15



n = 12  
Slope = -0.007242 units per year.  
Mann-Kendall statistic = -42  
critical = -38  
Decreasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Lithium Analysis Run 1/2/2018 10:26 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

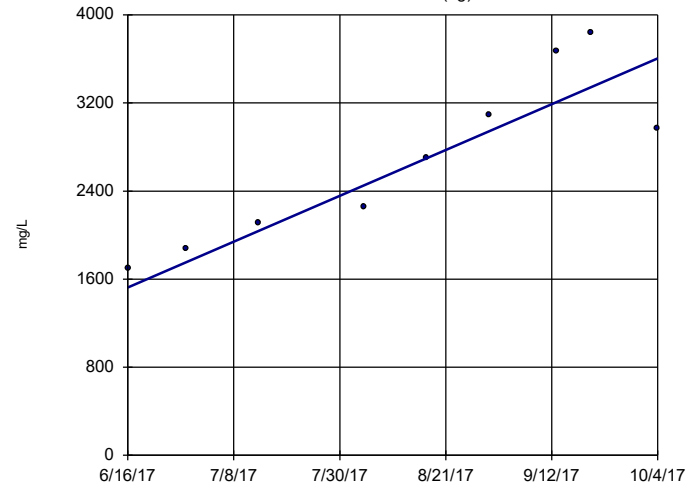
Sen's Slope Estimator  
MW-9D



n = 8  
Slope = -0.3866 units per year.  
Mann-Kendall statistic = -28  
critical = -21  
Decreasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Molybdenum Analysis Run 1/2/2018 10:27 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Sen's Slope Estimator  
MW-7D (bg)

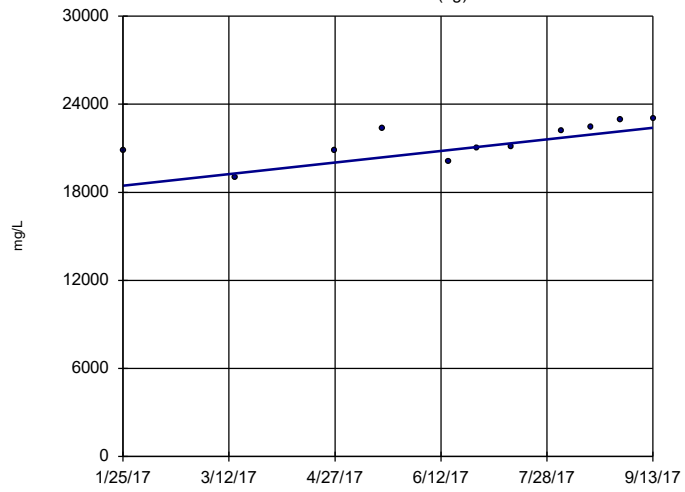


n = 9  
Slope = 6905 units per year.  
Mann-Kendall statistic = 30  
critical = 25  
Increasing trend significant at 99% confidence level ( $\alpha = 0.005$  per tail).

Constituent: Total Dissolve Solids [TDS] Analysis Run 1/2/2018 10:27 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-8D (bg)



n = 11  
Slope = 6248  
units per year.  
Mann-Kendall  
statistic = 39  
critical = 34  
Increasing trend  
significant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Total Dissolve Solids [TDS] Analysis Run 1/2/2018 10:27 PM View: Trend Tests  
Northeastern LF Client: Geosyntec Data: Northeastern LF

# Trend Test Summary Table - New Wells Significant Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 3/6/2019, 10:05 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
<b>Cadmium (mg/L)</b>	<b>MW-5D</b>	<b>-0.0006039</b>	<b>-29</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>33.33</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
<b>Cobalt (mg/L)</b>	<b>MW-5D</b>	<b>-0.001422</b>	<b>-28</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>11.11</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>

# Trend Test Summary Table - New Wells All Results

Northeastern LF    Client: Geosyntec    Data: Northeastern LF    Printed 3/6/2019, 10:05 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Antimony (mg/L)	MW-4D	-0.0002888	-12	-25	No	9	44.44	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-12D	-0.002972	-14	-25	No	9	44.44	n/a	n/a	0.01	NP
Antimony (mg/L)	MW-5D	-0.0005811	-17	-25	No	9	33.33	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-4D	-0.002245	-17	-25	No	9	22.22	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-12D	0.004484	9	25	No	9	22.22	n/a	n/a	0.01	NP
Arsenic (mg/L)	MW-5D	-0.001798	-19	-25	No	9	33.33	n/a	n/a	0.01	NP
Barium (mg/L)	MW-4D	-0.001659	-2	-21	No	8	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-12D	0.01387	6	25	No	9	0	n/a	n/a	0.01	NP
Barium (mg/L)	MW-5D	-0.0252	-6	-25	No	9	0	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-4D	0	-8	-25	No	9	55.56	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-12D	-0.0003029	-14	-25	No	9	33.33	n/a	n/a	0.01	NP
Beryllium (mg/L)	MW-5D	-0.0001632	-16	-25	No	9	55.56	n/a	n/a	0.01	NP
Boron (mg/L)	MW-4D	-0.1057	-9	-25	No	9	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-12D	1.148	18	25	No	9	0	n/a	n/a	0.01	NP
Boron (mg/L)	MW-5D	0.1092	10	25	No	9	0	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-4D	-0.0004675	-15	-25	No	9	33.33	n/a	n/a	0.01	NP
Cadmium (mg/L)	MW-12D	-0.0004574	-10	-25	No	9	22.22	n/a	n/a	0.01	NP
<b>Cadmium (mg/L)</b>	<b>MW-5D</b>	<b>-0.0006039</b>	<b>-29</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>33.33</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Calcium (mg/L)	MW-4D	-8.826	-4	-30	No	10	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-12D	-15.21	-11	-30	No	10	0	n/a	n/a	0.01	NP
Calcium (mg/L)	MW-5D	19.12	29	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-4D	8.132	13	30	No	10	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-12D	-1.25	-5	-25	No	9	0	n/a	n/a	0.01	NP
Chloride (mg/L)	MW-5D	1.14	6	25	No	9	0	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-4D	-0.002411	-17	-25	No	9	22.22	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-12D	-0.0004559	-3	-25	No	9	22.22	n/a	n/a	0.01	NP
Chromium (mg/L)	MW-5D	-0.0003455	-16	-25	No	9	11.11	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-4D	-0.001361	-20	-25	No	9	11.11	n/a	n/a	0.01	NP
Cobalt (mg/L)	MW-12D	-0.000945	-12	-25	No	9	11.11	n/a	n/a	0.01	NP
<b>Cobalt (mg/L)</b>	<b>MW-5D</b>	<b>-0.001422</b>	<b>-28</b>	<b>-25</b>	<b>Yes</b>	<b>9</b>	<b>11.11</b>	<b>n/a</b>	<b>n/a</b>	<b>0.01</b>	<b>NP</b>
Combined Radium 226 + 228 (pCi/L)	MW-4D	0.6447	3	21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-12D	2.756	8	21	No	8	0	n/a	n/a	0.01	NP
Combined Radium 226 + 228 (pCi/L)	MW-5D	1.995	8	21	No	8	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-4D	0	-12	-30	No	10	70	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-12D	0.3145	11	30	No	10	0	n/a	n/a	0.01	NP
Fluoride (mg/L)	MW-5D	-0.233	-2	-25	No	9	0	n/a	n/a	0.01	NP
Lead (mg/L)	MW-4D	-0.002517	-17	-25	No	9	33.33	n/a	n/a	0.01	NP
Lead (mg/L)	MW-12D	-0.001281	-5	-25	No	9	22.22	n/a	n/a	0.01	NP
Lead (mg/L)	MW-5D	-0.002233	-21	-25	No	9	22.22	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-4D	-0.001623	-8	-21	No	8	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-12D	-0.007833	-18	-21	No	8	0	n/a	n/a	0.01	NP
Lithium (mg/L)	MW-5D	-0.004334	-13	-21	No	8	0	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-4D	0	-2	-25	No	9	88.89	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-12D	-0.00001049	-17	-25	No	9	55.56	n/a	n/a	0.01	NP
Mercury (mg/L)	MW-5D	0	-2	-25	No	9	88.89	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-4D	-0.001125	-10	-21	No	8	0	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-12D	0.1663	6	21	No	8	0	n/a	n/a	0.01	NP
Molybdenum (mg/L)	MW-5D	-0.001715	-10	-21	No	8	12.5	n/a	n/a	0.01	NP
pH, field (SU)	MW-4D	0.2607	5	30	No	10	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-12D	1.929	15	30	No	10	0	n/a	n/a	0.01	NP
pH, field (SU)	MW-5D	0.5368	4	30	No	10	0	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-4D	-0.003066	-20	-25	No	9	44.44	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-12D	-0.001601	-10	-25	No	9	11.11	n/a	n/a	0.01	NP
Selenium (mg/L)	MW-5D	-0.002613	-23	-25	No	9	33.33	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-4D	42.98	21	30	No	10	0	n/a	n/a	0.01	NP

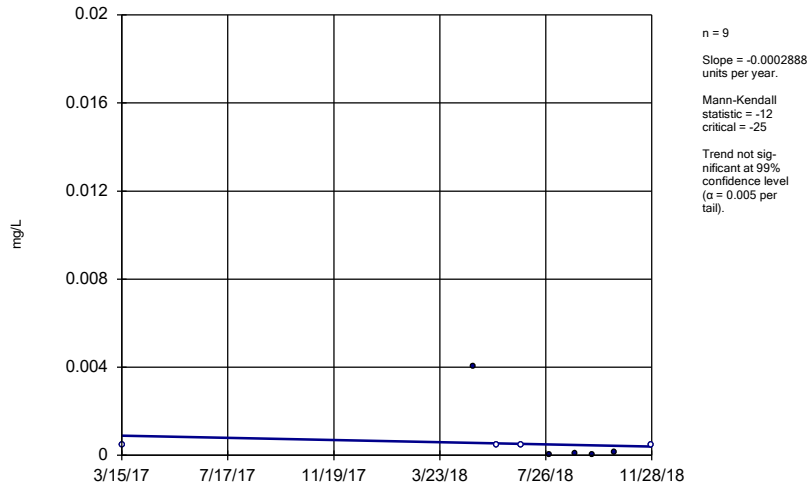
# Trend Test Summary Table - New Wells All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 3/6/2019, 10:05 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Sulfate (mg/L)	MW-12D	-60.67	-14	-25	No	9	0	n/a	n/a	0.01	NP
Sulfate (mg/L)	MW-5D	29.07	12	25	No	9	0	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-4D	0	-2	-25	No	9	44.44	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-12D	-0.0005747	-9	-25	No	9	33.33	n/a	n/a	0.01	NP
Thallium (mg/L)	MW-5D	0	3	25	No	9	55.56	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-4D	-11.06	-2	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-12D	-36.65	-4	-25	No	9	0	n/a	n/a	0.01	NP
Total Dissolved Solids [TDS] (mg/L)	MW-5D	-14.04	-2	-21	No	8	0	n/a	n/a	0.01	NP

### Sen's Slope Estimator

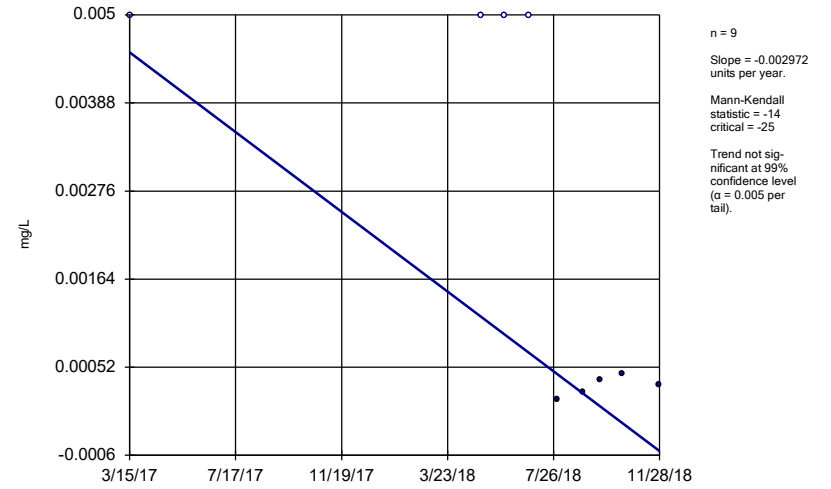
MW-4D



Constituent: Antimony Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

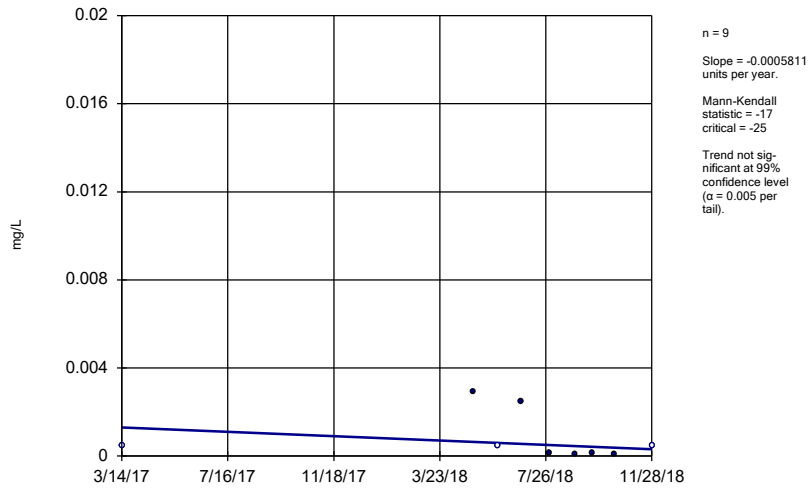
MW-12D



Constituent: Antimony Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

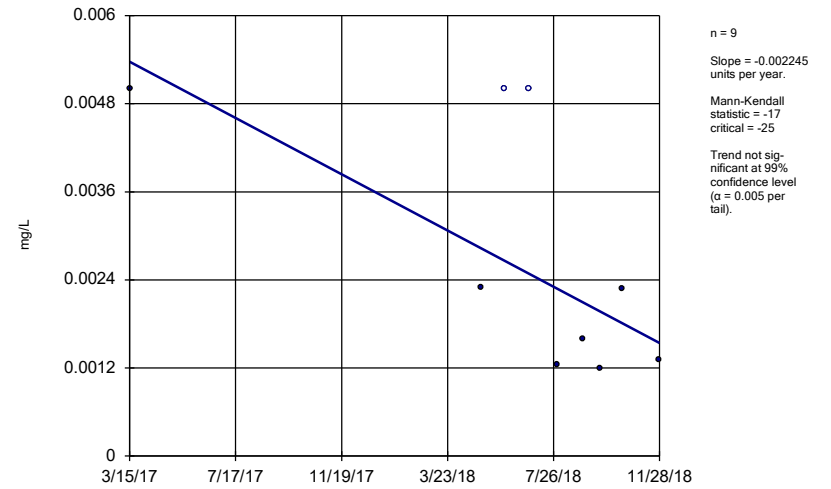
MW-5D



Constituent: Antimony Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-4D

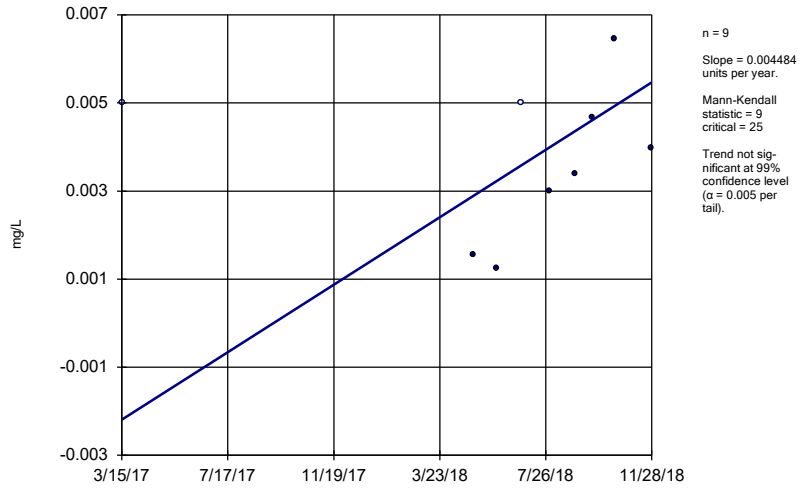


Constituent: Arsenic Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF



### Sen's Slope Estimator

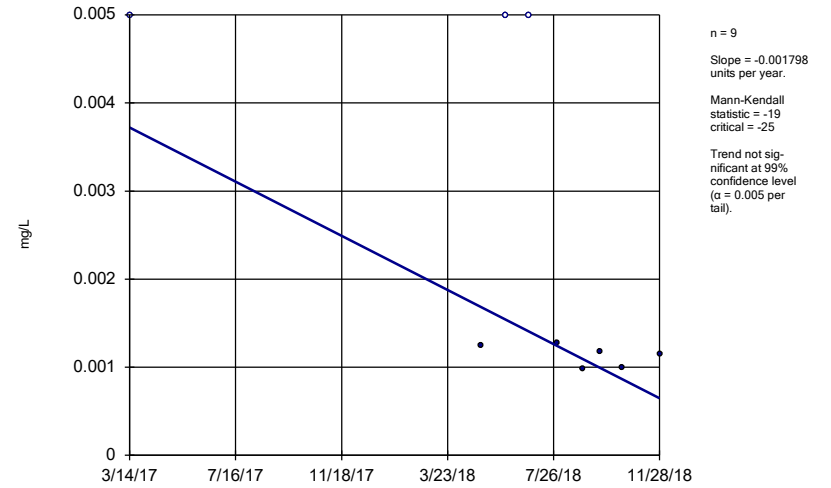
MW-12D



Constituent: Arsenic Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

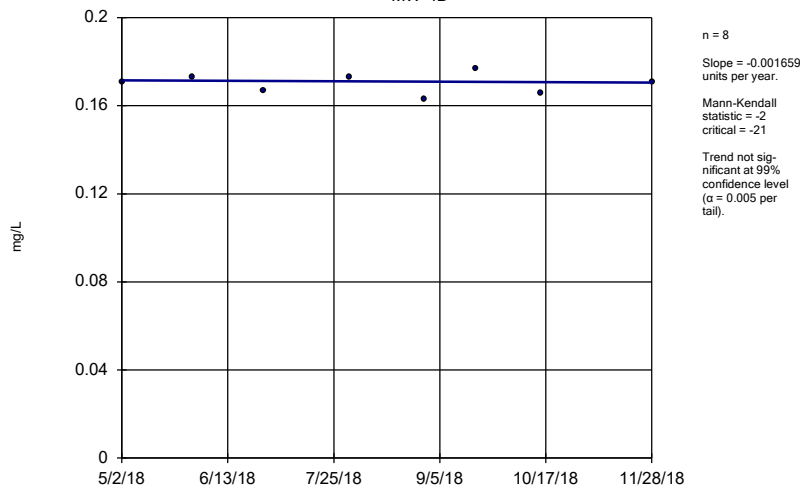
MW-5D



Constituent: Arsenic Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

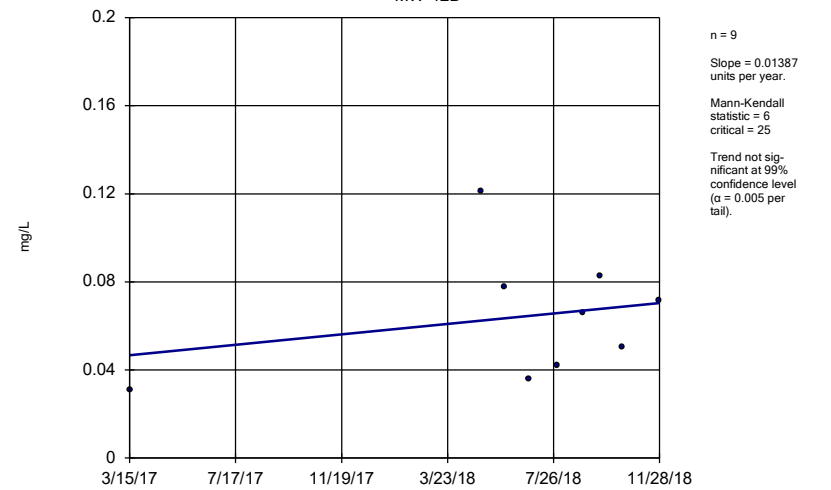
MW-4D



Constituent: Barium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

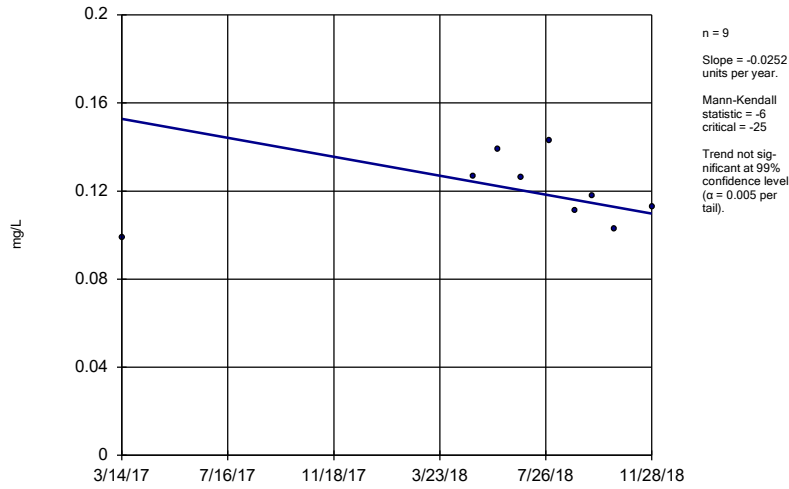
MW-12D



Constituent: Barium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D

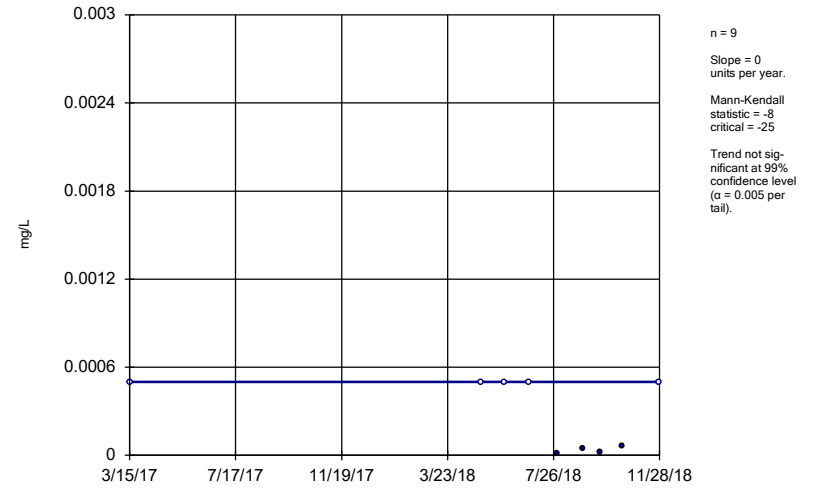


Constituent: Barium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

MW-4D

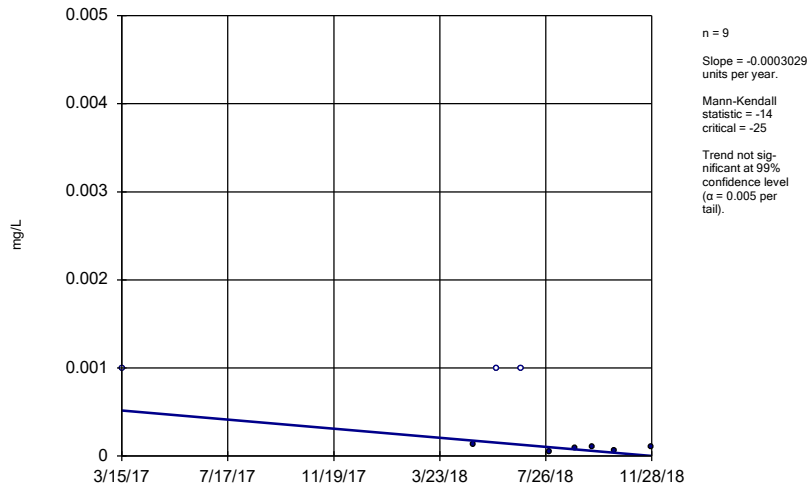


Constituent: Beryllium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

MW-12D

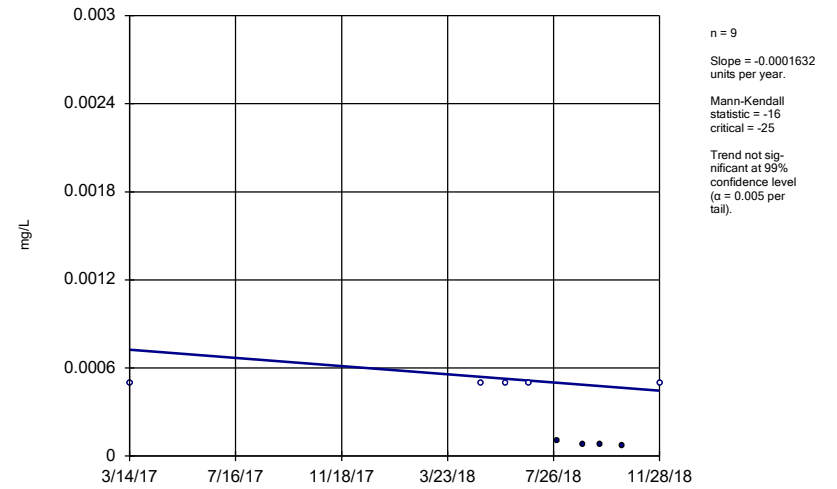


Constituent: Beryllium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

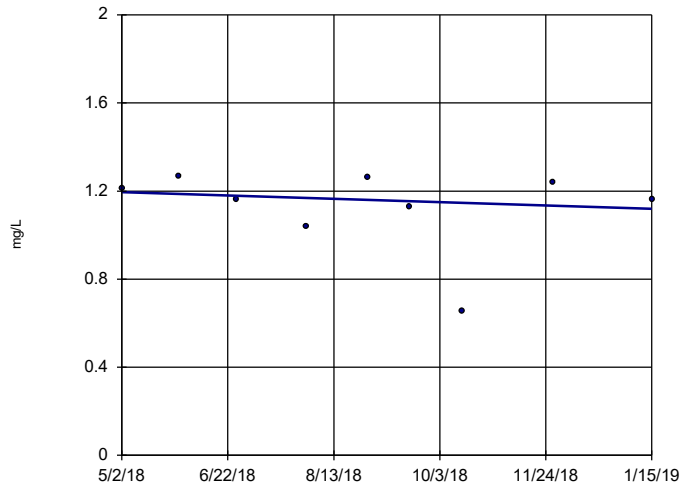
MW-5D



Constituent: Beryllium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-4D

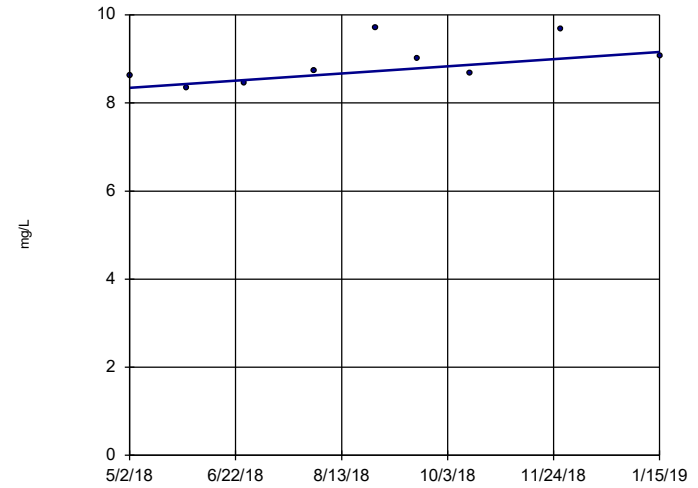


n = 9  
 Slope = -0.1057  
 units per year.  
 Mann-Kendall  
 statistic = -9  
 critical = -25  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Boron Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-12D

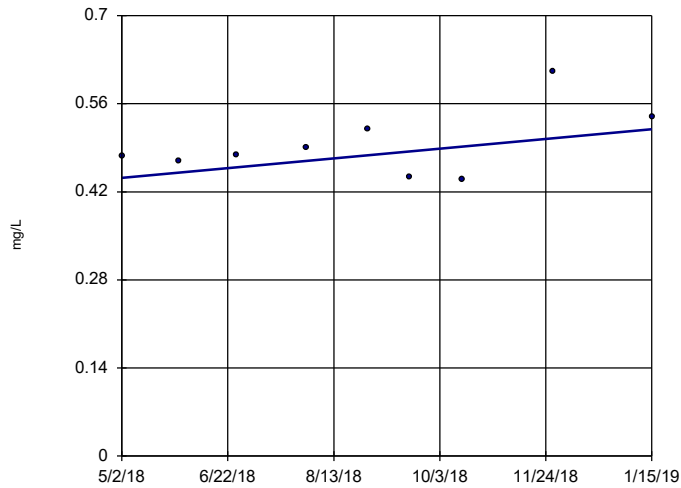


n = 9  
 Slope = 1.148  
 units per year.  
 Mann-Kendall  
 statistic = 18  
 critical = 25  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Boron Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D



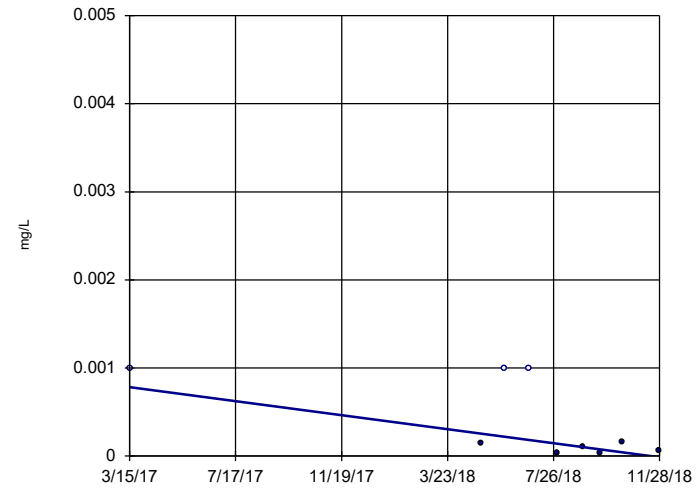
n = 9  
 Slope = 0.1092  
 units per year.  
 Mann-Kendall  
 statistic = 10  
 critical = 25  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Boron Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

MW-4D

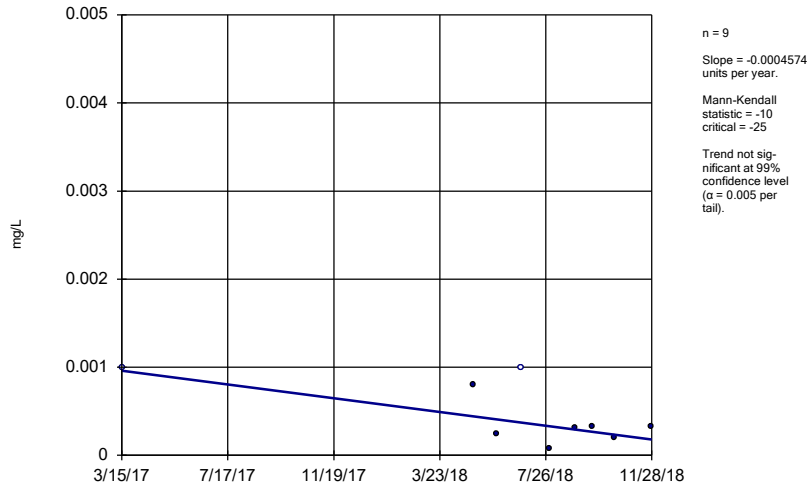


n = 9  
 Slope = -0.0004675  
 units per year.  
 Mann-Kendall  
 statistic = -15  
 critical = -25  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 (α = 0.005 per  
 tail).

Constituent: Cadmium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

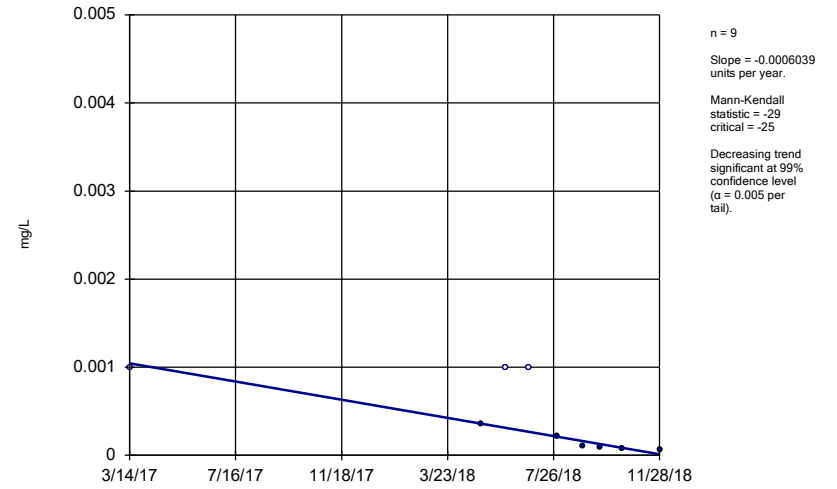
MW-12D



Constituent: Cadmium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

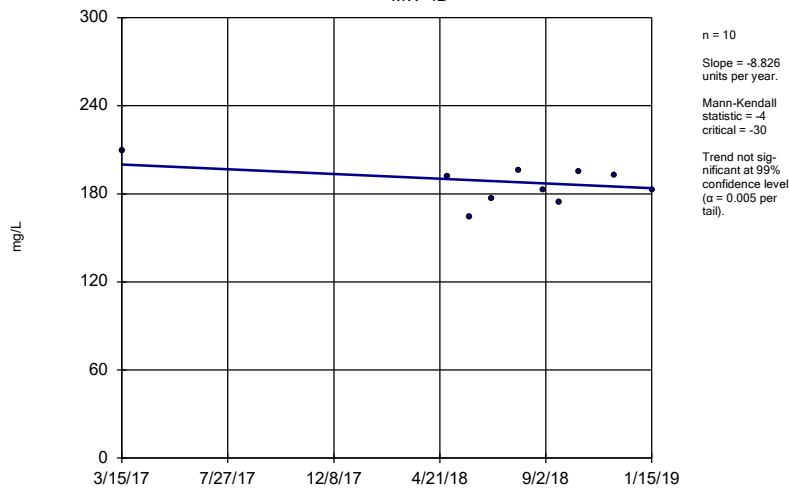
MW-5D



Constituent: Cadmium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

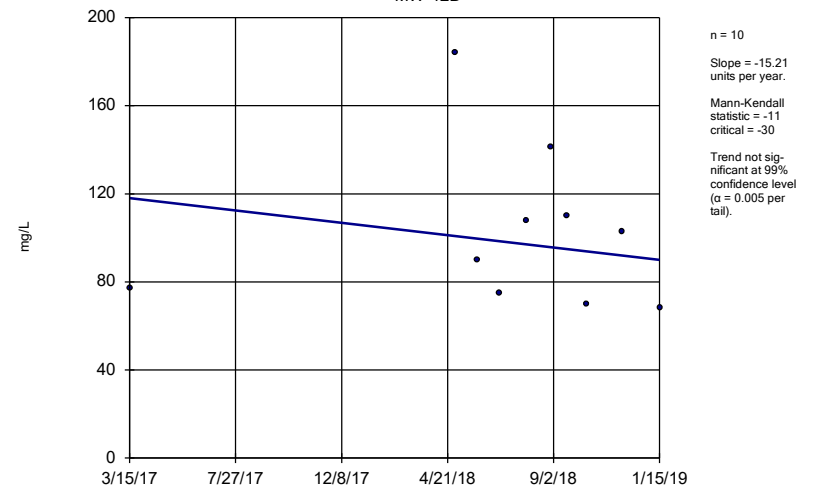
MW-4D



Constituent: Calcium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

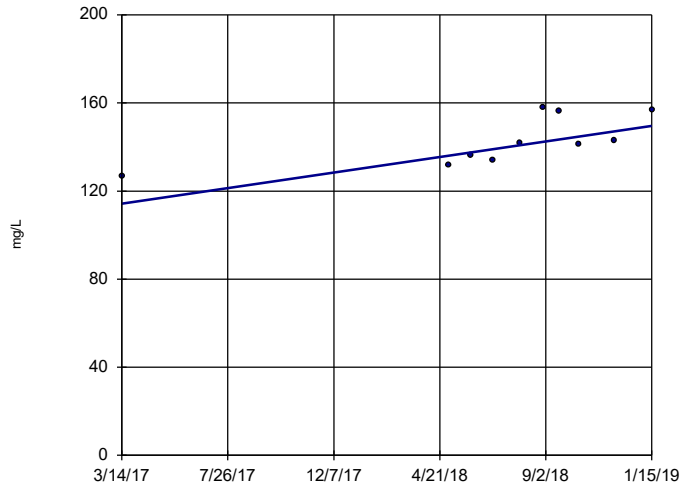
MW-12D



Constituent: Calcium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D

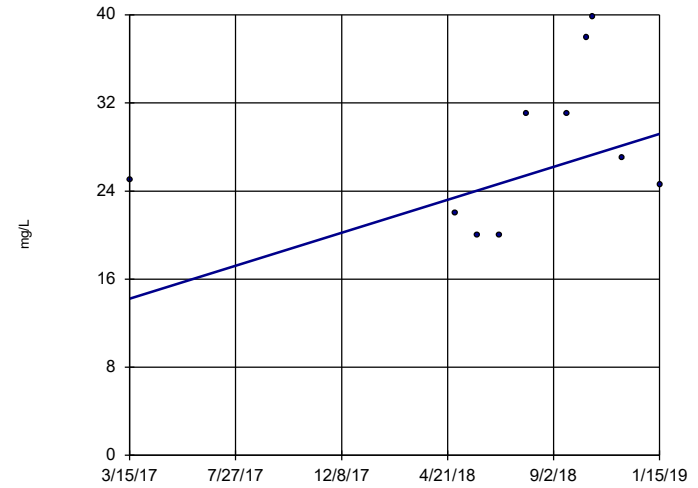


n = 10  
 Slope = 19.12 units per year.  
 Mann-Kendall statistic = 29  
 critical = 30  
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Calcium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-4D

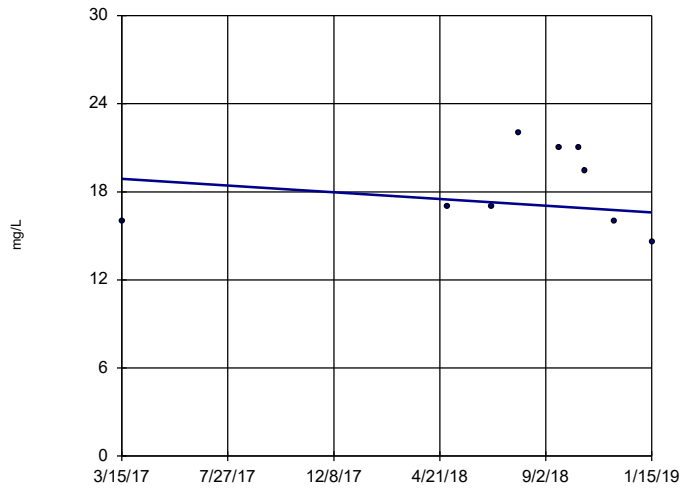


n = 10  
 Slope = 8.132 units per year.  
 Mann-Kendall statistic = 13  
 critical = 30  
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-12D

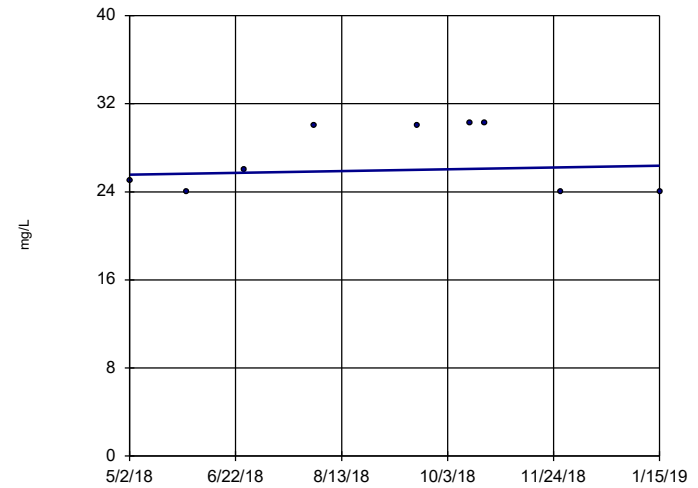


n = 9  
 Slope = -1.25 units per year.  
 Mann-Kendall statistic = -5  
 critical = -25  
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D

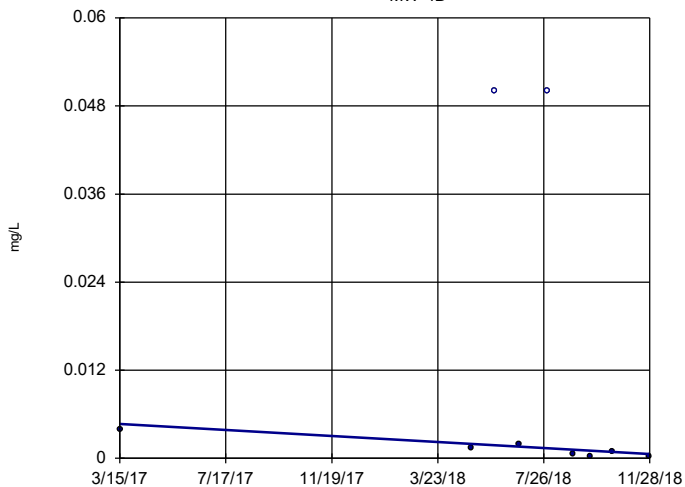


n = 9  
 Slope = 1.14 units per year.  
 Mann-Kendall statistic = 6  
 critical = 25  
 Trend not significant at 99% confidence level (α = 0.005 per tail).

Constituent: Chloride Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-4D

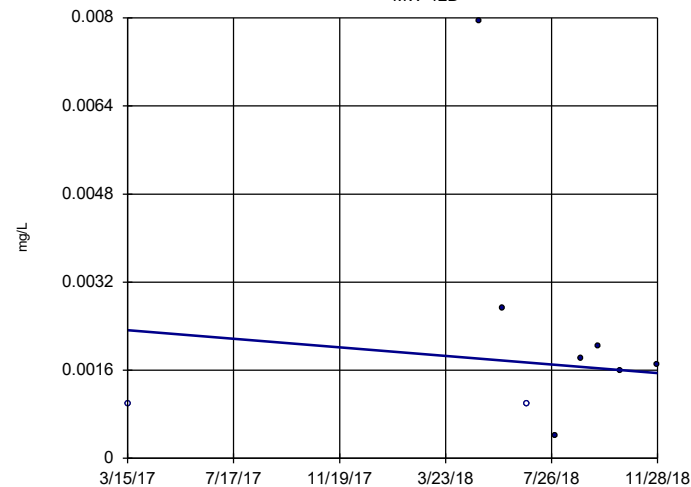


n = 9  
Slope = -0.002411  
units per year.  
Mann-Kendall  
statistic = -17  
critical = -25  
Trend not sig-  
nificant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Chromium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-12D

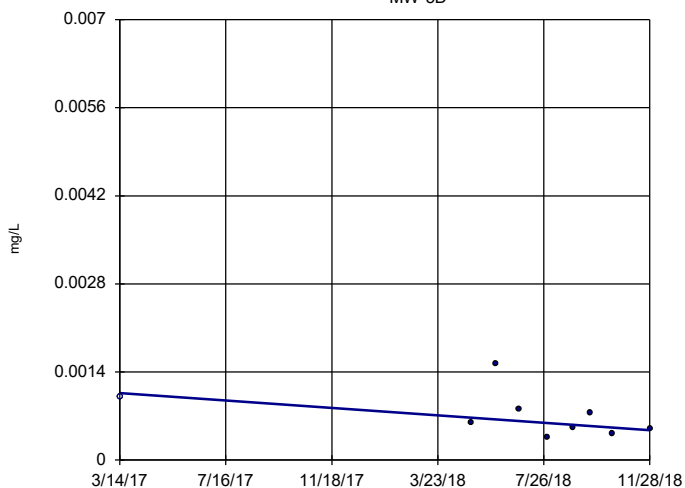


n = 9  
Slope = -0.0004559  
units per year.  
Mann-Kendall  
statistic = -3  
critical = -25  
Trend not sig-  
nificant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Chromium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D

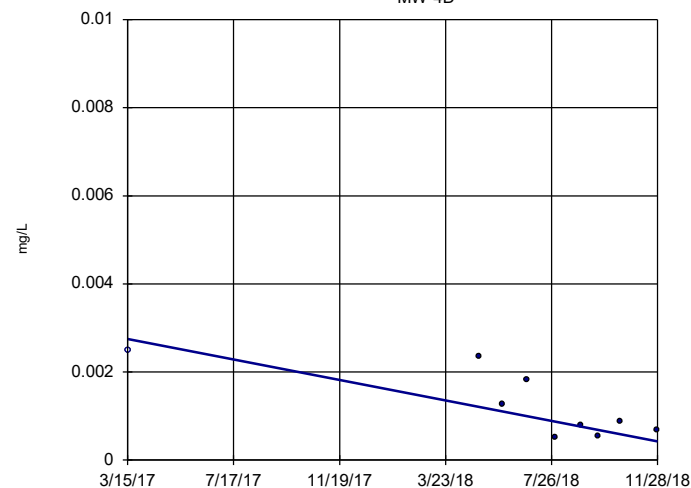


n = 9  
Slope = -0.0003455  
units per year.  
Mann-Kendall  
statistic = -16  
critical = -25  
Trend not sig-  
nificant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Chromium Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-4D

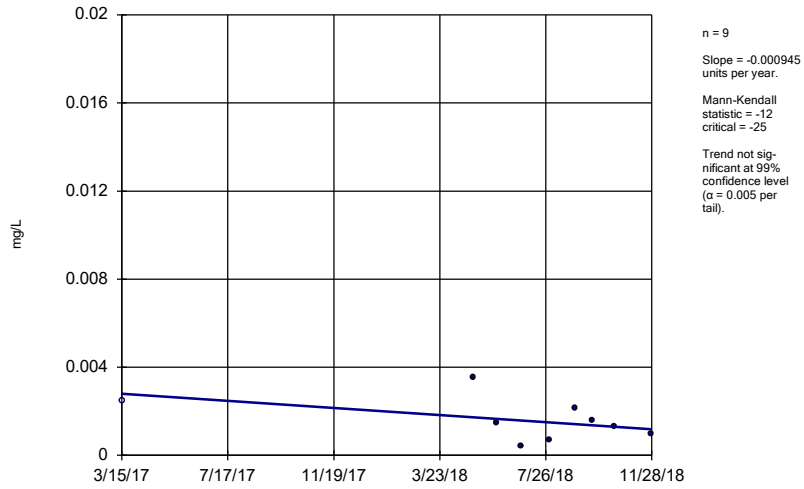


n = 9  
Slope = -0.001361  
units per year.  
Mann-Kendall  
statistic = -20  
critical = -25  
Trend not sig-  
nificant at 99%  
confidence level  
( $\alpha = 0.005$  per  
tail).

Constituent: Cobalt Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

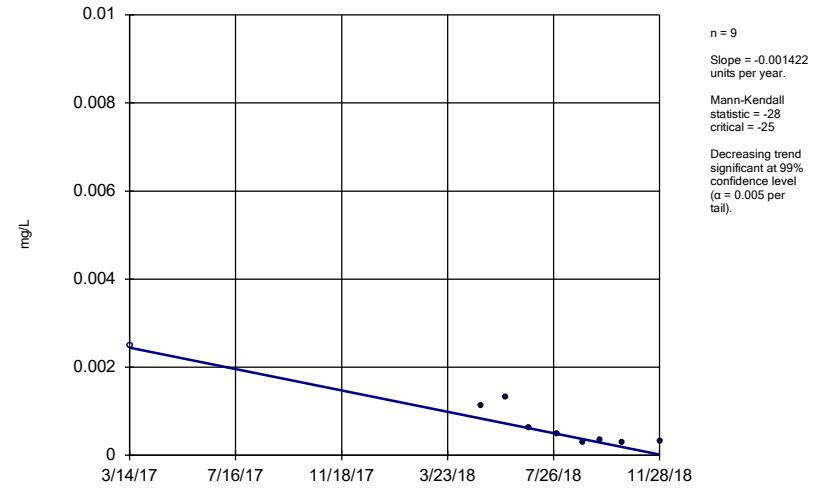
MW-12D



Constituent: Cobalt Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

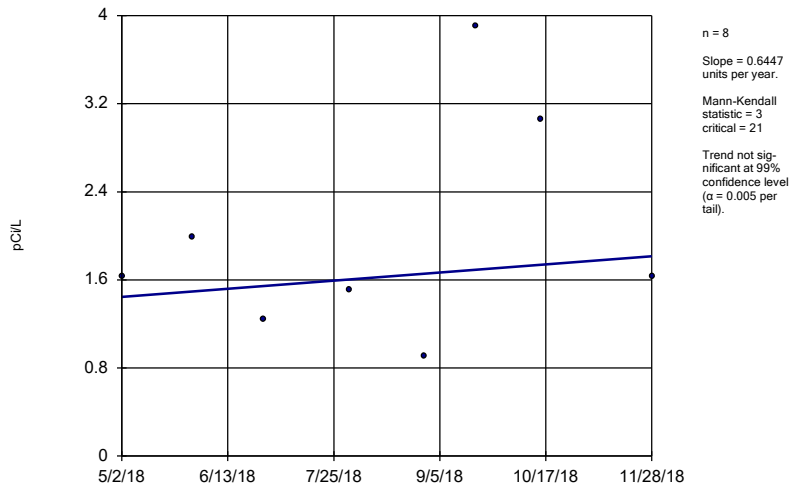
MW-5D



Constituent: Cobalt Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

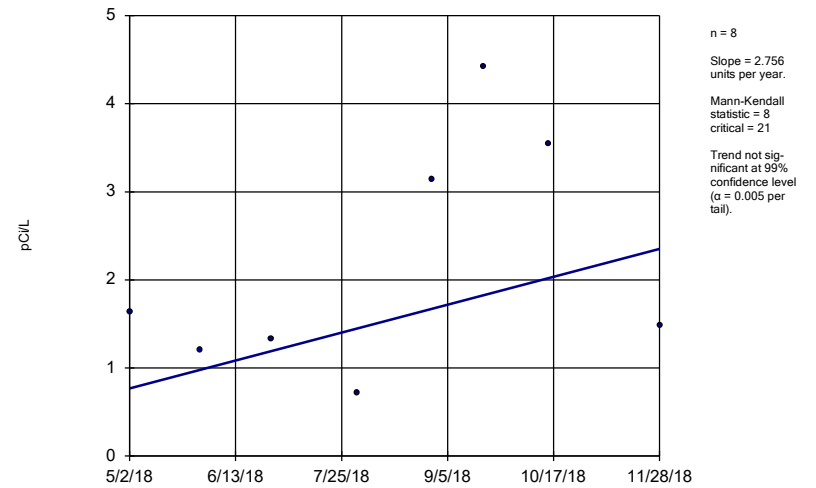
MW-4D



Constituent: Combined Radium 226 + 228 Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

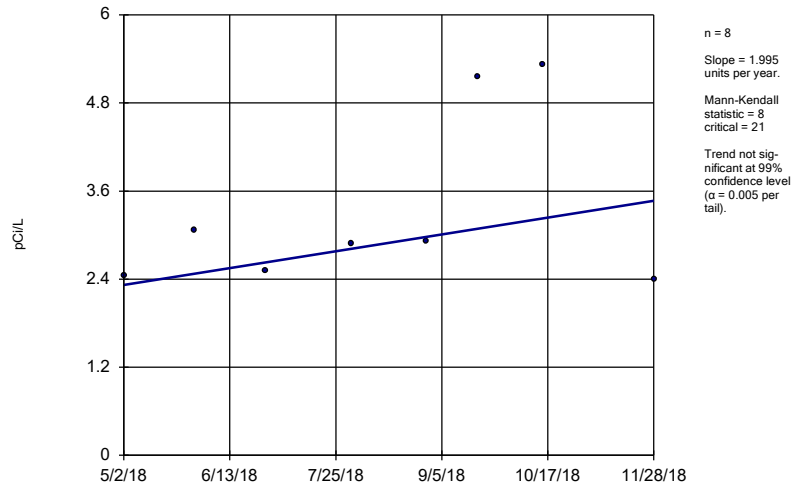
MW-12D



Constituent: Combined Radium 226 + 228 Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D

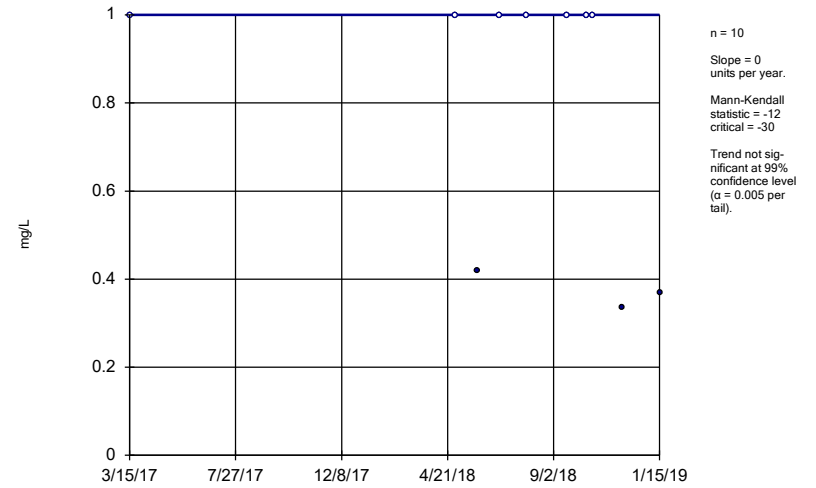


Constituent: Combined Radium 226 + 228 Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

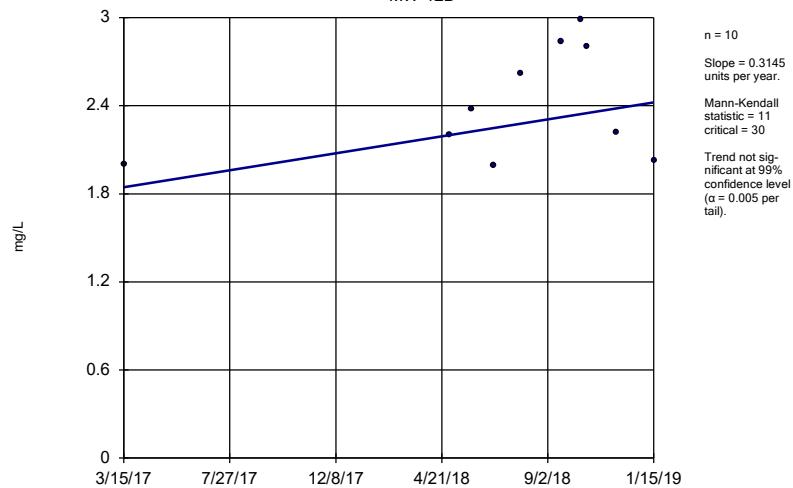
MW-4D



Constituent: Fluoride Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

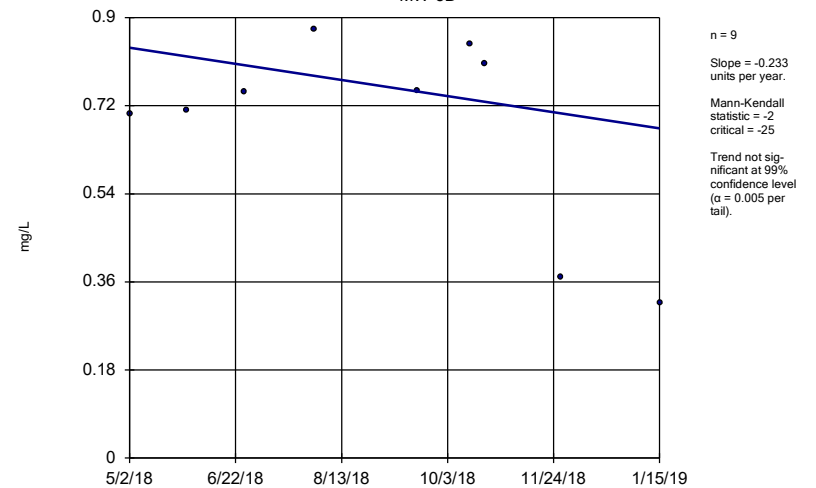
MW-12D



Constituent: Fluoride Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D

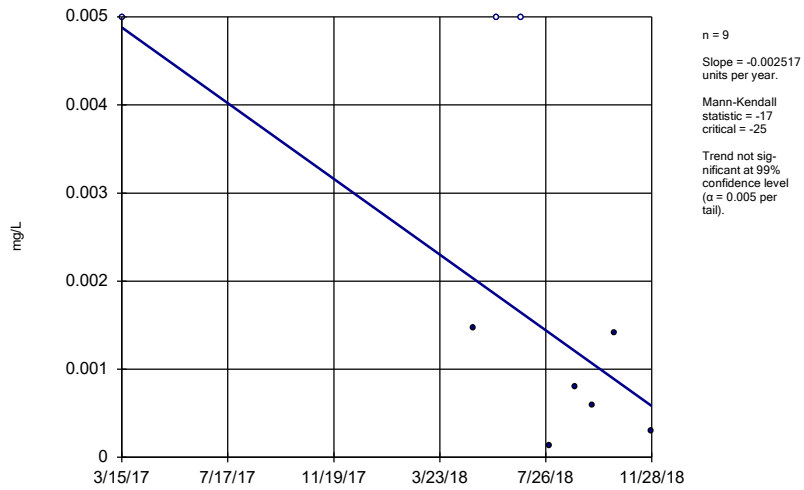


Constituent: Fluoride Analysis Run 3/6/2019 10:03 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF



### Sen's Slope Estimator

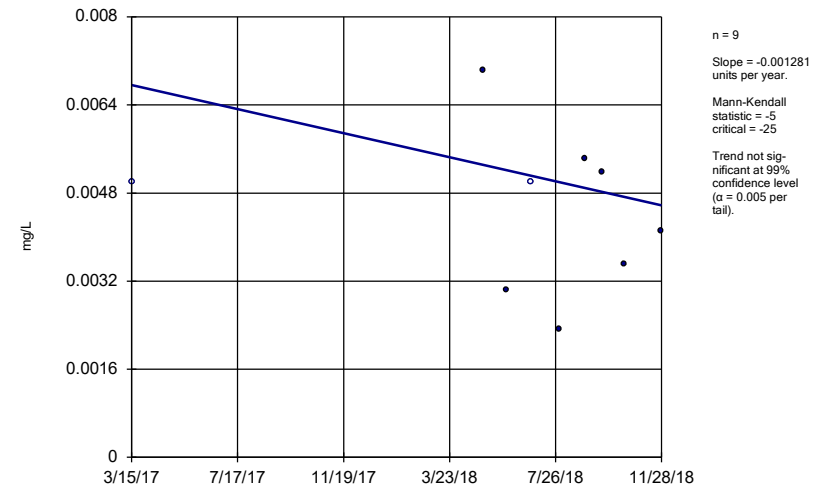
MW-4D



Constituent: Lead Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

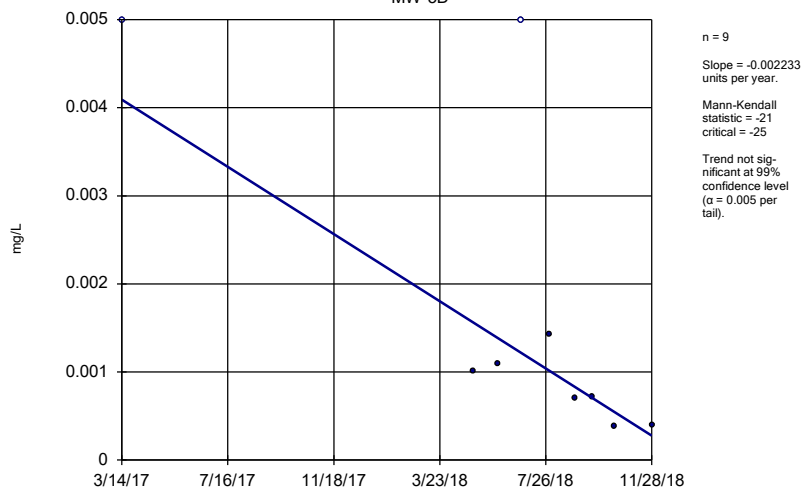
MW-12D



Constituent: Lead Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

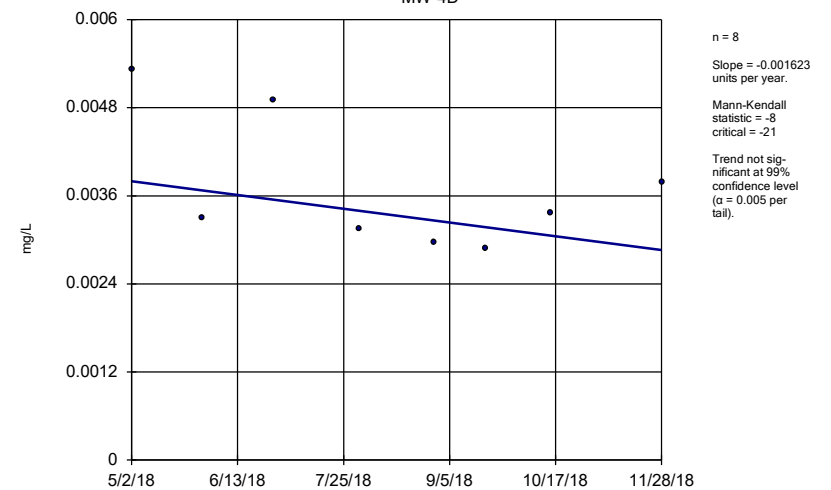
MW-5D



Constituent: Lead Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

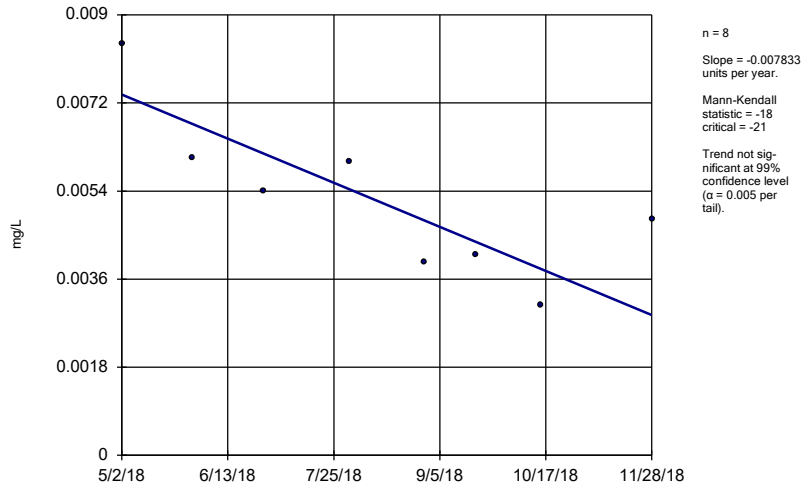
MW-4D



Constituent: Lithium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

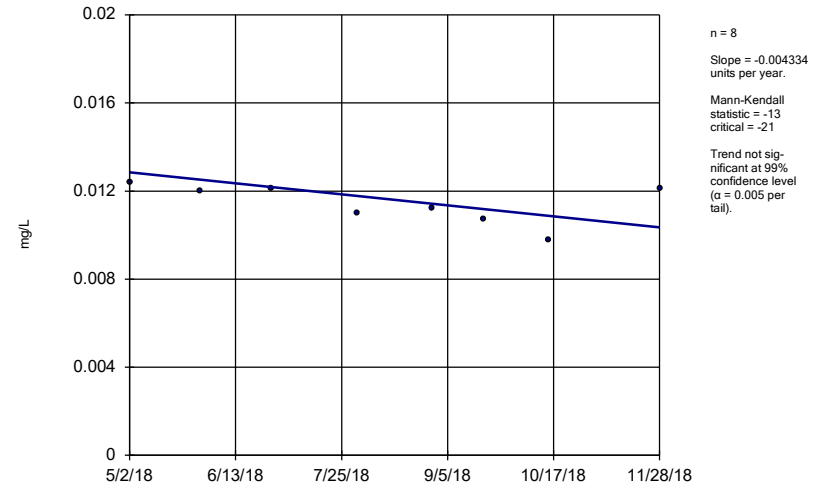
MW-12D



Constituent: Lithium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

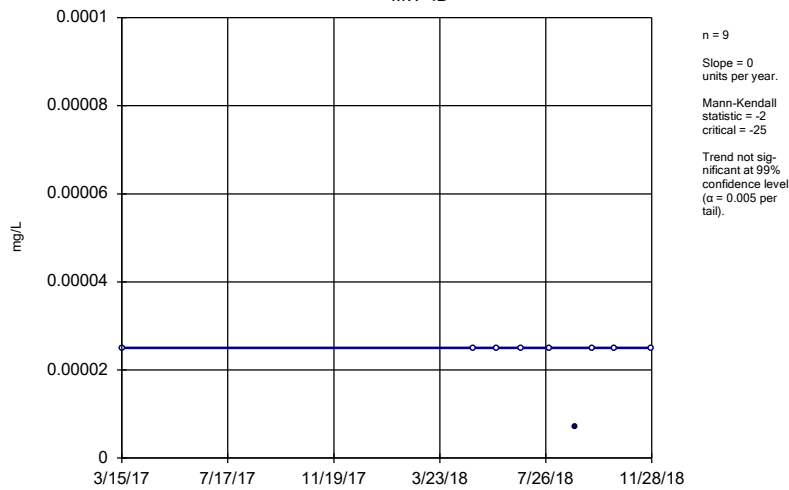
MW-5D



Constituent: Lithium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

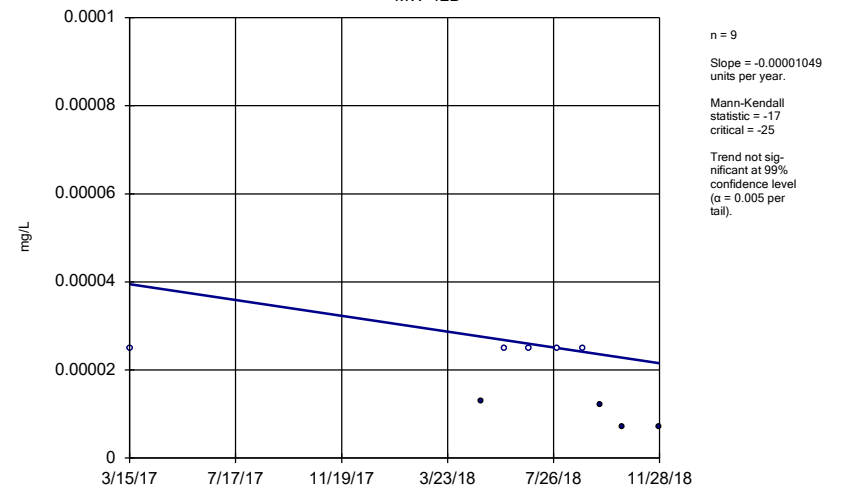
MW-4D



Constituent: Mercury Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

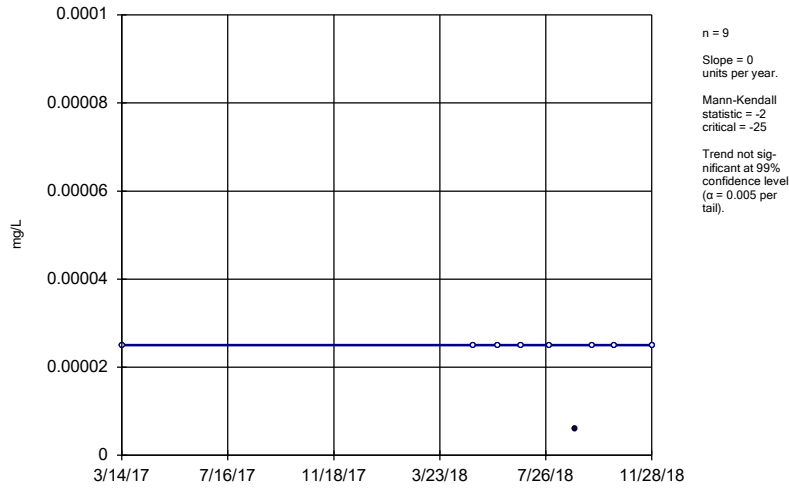
MW-12D



Constituent: Mercury Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

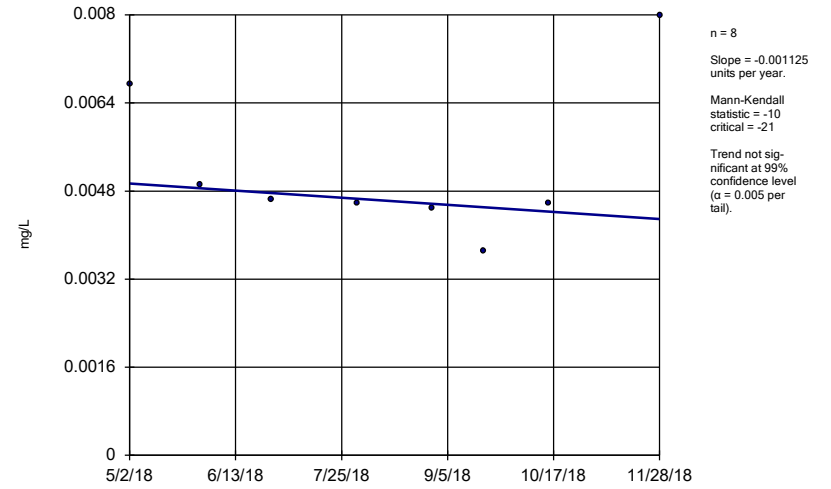
MW-5D



Constituent: Mercury Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

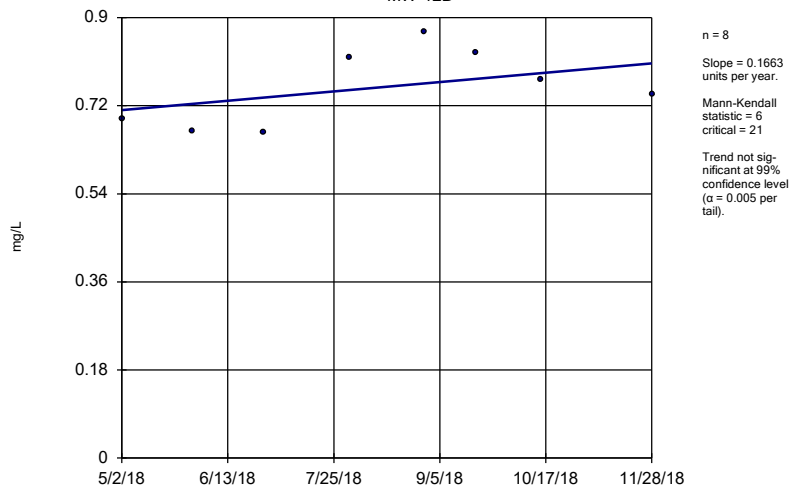
MW-4D



Constituent: Molybdenum Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

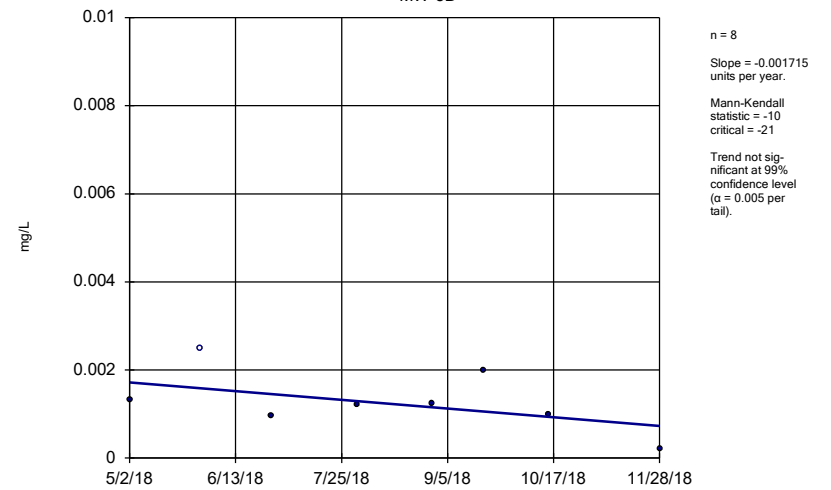
MW-12D



Constituent: Molybdenum Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

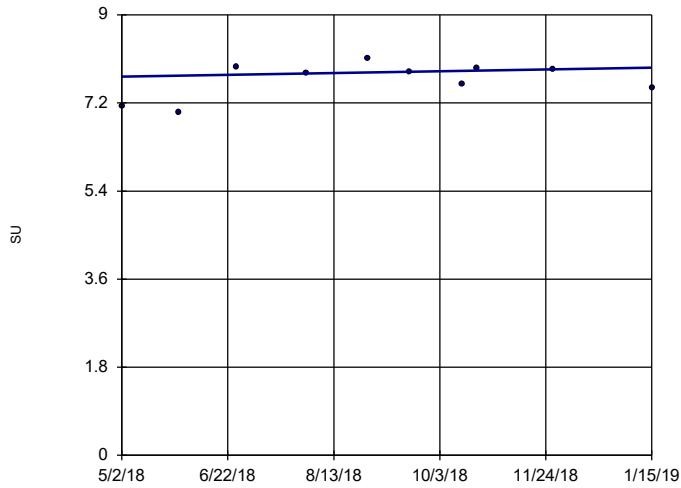
MW-5D



Constituent: Molybdenum Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-4D

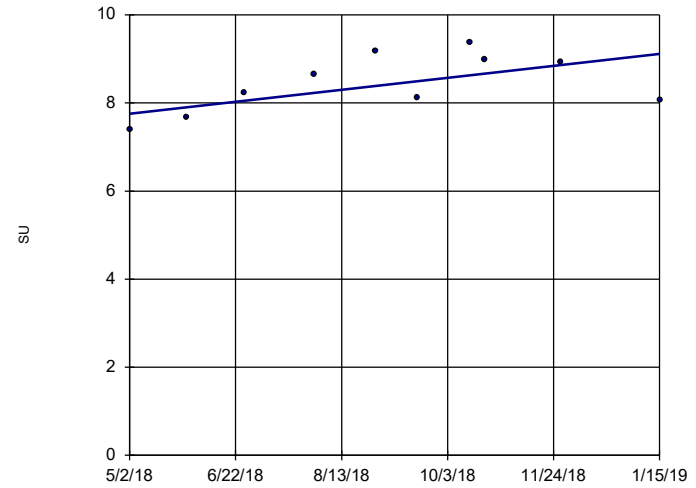


n = 10  
 Slope = 0.2607  
 units per year.  
 Mann-Kendall  
 statistic = 5  
 critical = 30  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: pH, field Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-12D

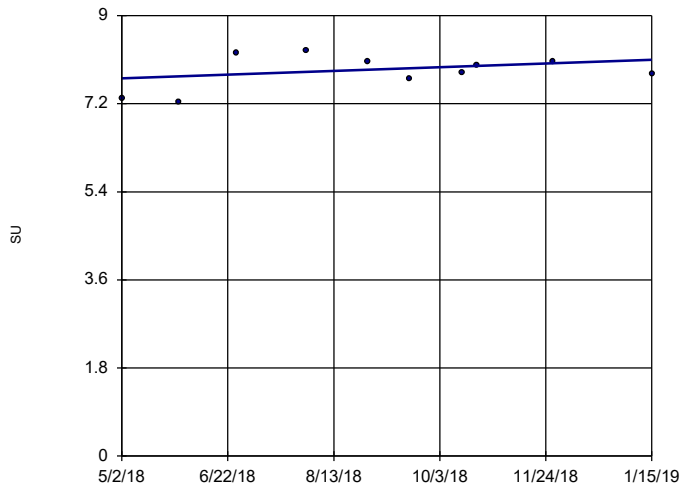


n = 10  
 Slope = 1.929  
 units per year.  
 Mann-Kendall  
 statistic = 15  
 critical = 30  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: pH, field Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D



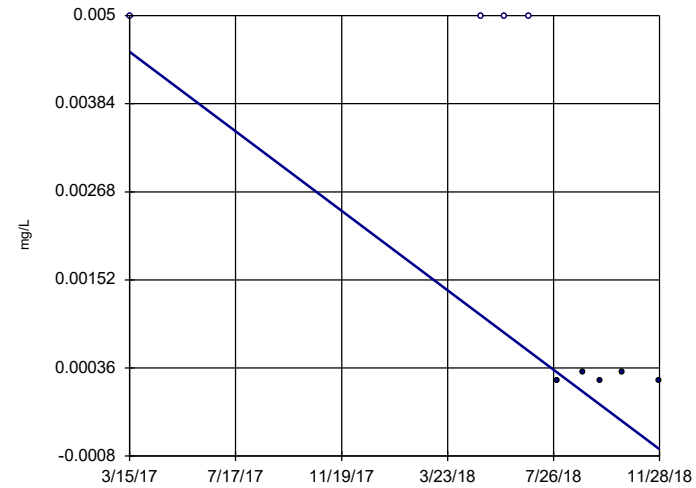
n = 10  
 Slope = 0.5368  
 units per year.  
 Mann-Kendall  
 statistic = 4  
 critical = 30  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: pH, field Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

MW-4D

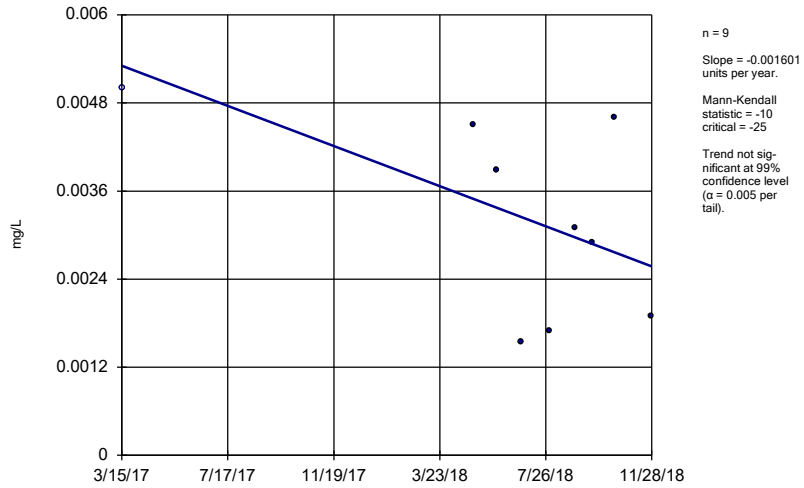


n = 9  
 Slope = -0.003066  
 units per year.  
 Mann-Kendall  
 statistic = -20  
 critical = -25  
 Trend not sig-  
 nificant at 99%  
 confidence level  
 ( $\alpha = 0.005$  per  
 tail).

Constituent: Selenium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

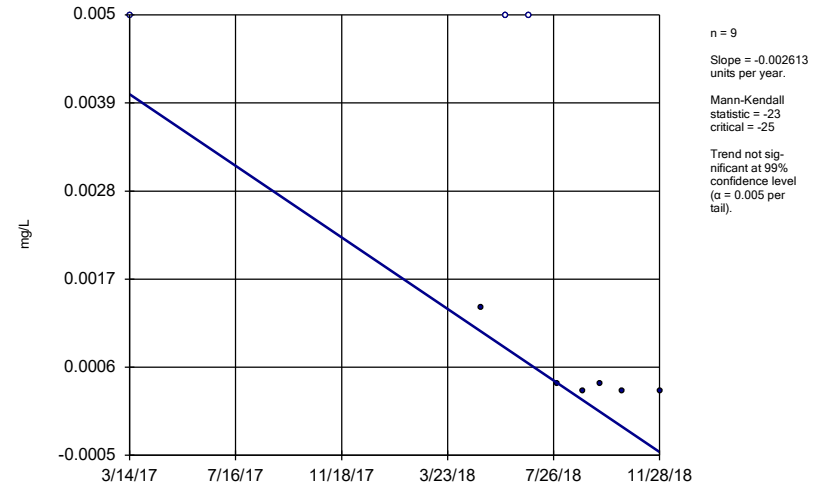
MW-12D



Constituent: Selenium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

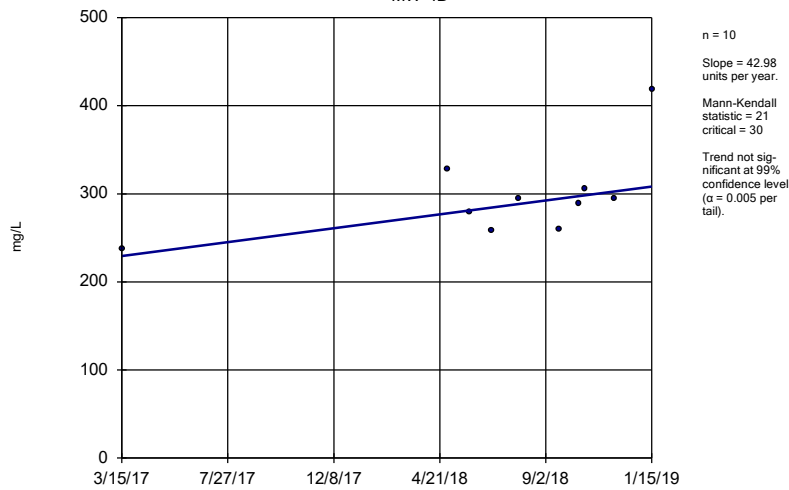
MW-5D



Constituent: Selenium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

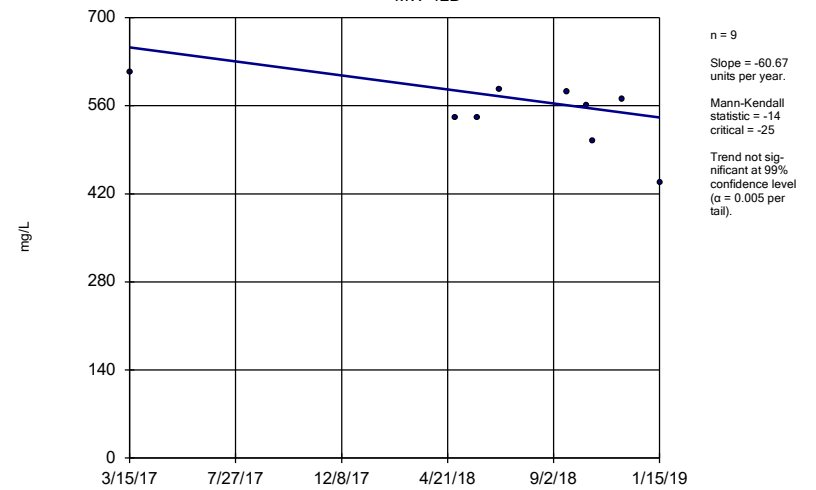
MW-4D



Constituent: Sulfate Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

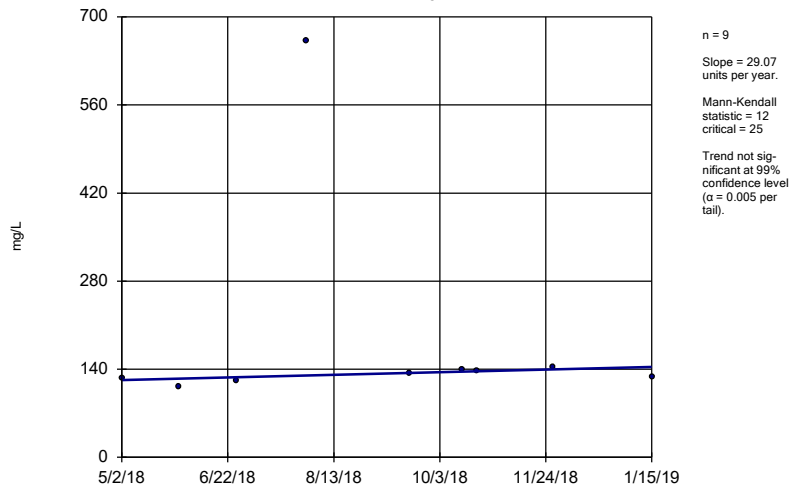
MW-12D



Constituent: Sulfate Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D

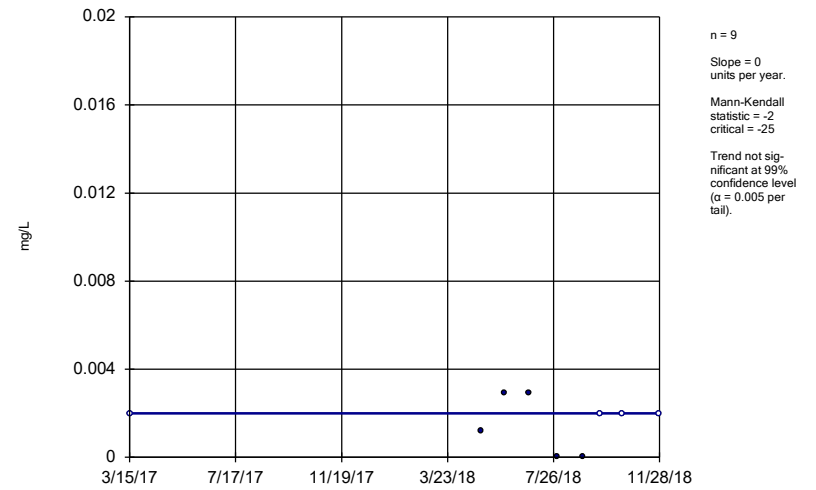


Constituent: Sulfate Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

MW-4D

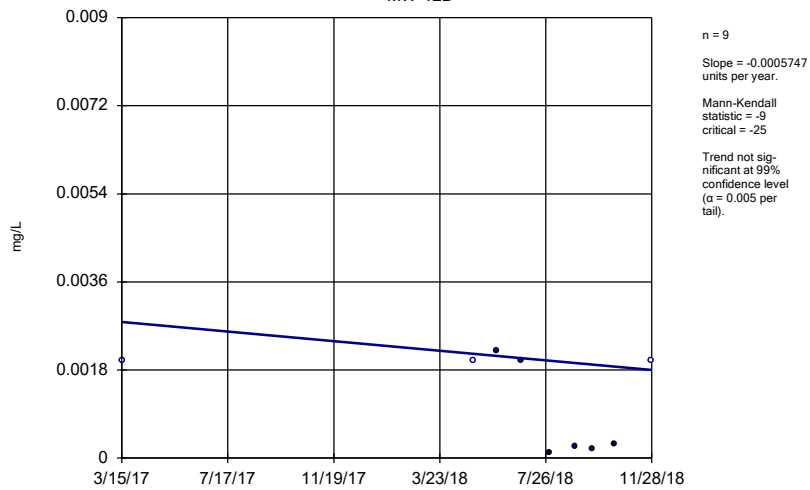


Constituent: Thallium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

MW-12D

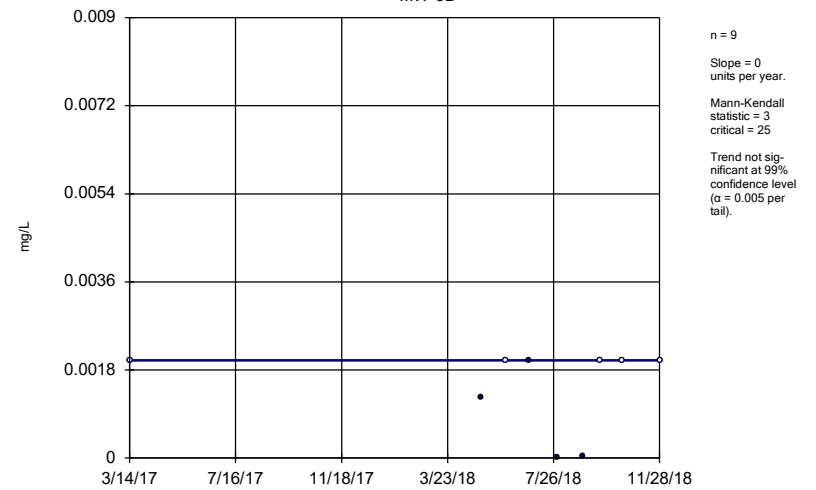


Constituent: Thallium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

Hollow symbols indicate censored values.

### Sen's Slope Estimator

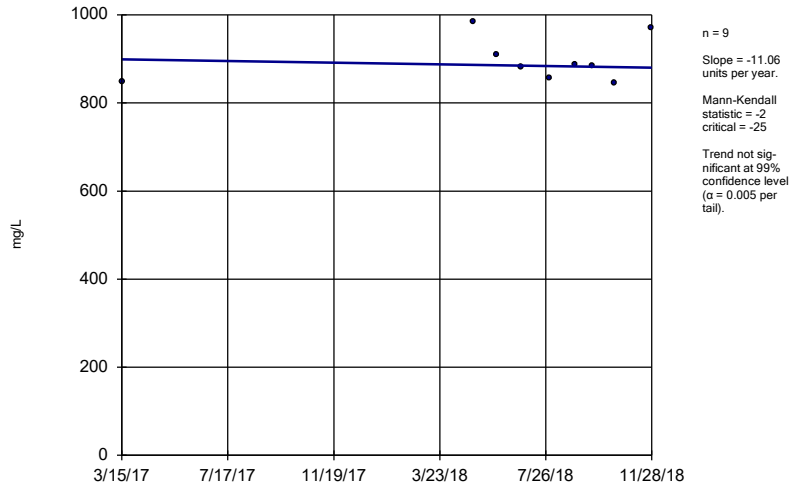
MW-5D



Constituent: Thallium Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

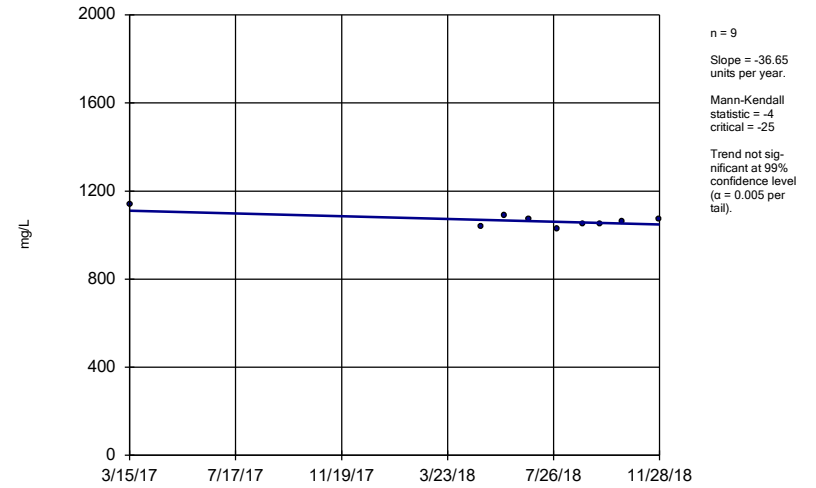
MW-4D



Constituent: Total Dissolved Solids [TDS] Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

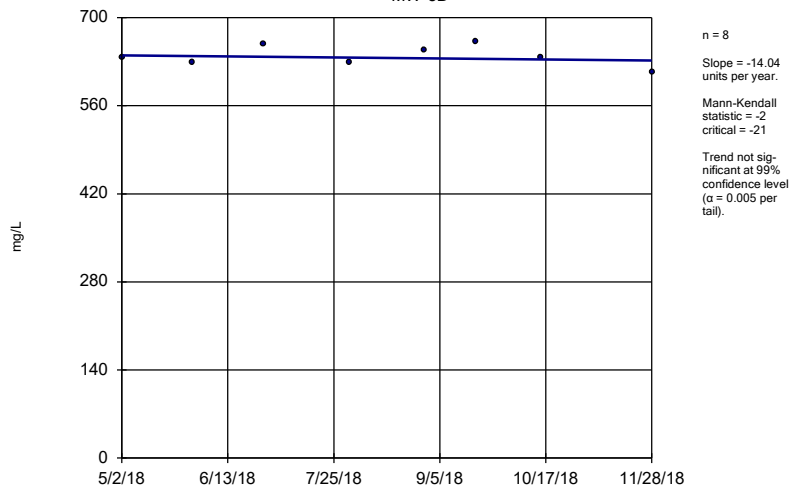
MW-12D



Constituent: Total Dissolved Solids [TDS] Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

### Sen's Slope Estimator

MW-5D



Constituent: Total Dissolved Solids [TDS] Analysis Run 3/6/2019 10:04 AM View: New Wells Screening  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

# Analysis of Variance

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 1/2/2018, 10:36 PM

<u>Constituent</u>	<u>Crit.</u>	<u>Sig.</u>	<u>Alpha</u>	<u>Transform</u>	<u>ANOVA Sig.</u>	<u>Calc.</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	n/a	n/a	n/a	No	Yes	4.385	0.05	NP (eq. var.)
Calcium (mg/L)	n/a	n/a	n/a	No	Yes	8.562	0.05	NP (eq. var.)
Chloride (mg/L)	n/a	n/a	n/a	sqrt(x)	Yes	1387	0.05	Param.
Fluoride (mg/L)	n/a	n/a	n/a	No	Yes	4.151	0.05	NP (normality)
pH, field (SU)	n/a	n/a	n/a	ln(x)	No	2.314	0.05	Param.
Sulfate (mg/L)	n/a	n/a	n/a	No	Yes	14.15	0.05	NP (normality)
Total Dissolve Solids [TDS] (mg/L)	n/a	n/a	n/a	No	Yes	1525	0.05	Param.



## Non-Parametric ANOVA

Constituent: Boron Analysis Run 1/2/2018 10:36 PM View: ANOVA  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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For observations made between 1/25/2017 and 10/4/2017, 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 = 4.385

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) = 4.365

Adjusted Kruskal-Wallis statistic (H') = 4.385

## Non-Parametric ANOVA

Constituent: Calcium Analysis Run 1/2/2018 10:36 PM View: ANOVA  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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For observations made between 1/25/2017 and 10/4/2017, 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 = 8.562

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

There were 1 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) = 8.556

Adjusted Kruskal-Wallis statistic (H') = 8.562

# Parametric ANOVA

Constituent: Chloride Analysis Run 1/2/2018 10:36 PM View: ANOVA  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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For observations made between 1/25/2017 and 10/4/2017 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 = 1387

Tabulated F statistic = 4.41 with 1 and 18 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	1.7e9	1	1.7e9	1525
Error Within Groups	2.1e7	18	1140393	
Total	1.8e9	19		

The Shapiro Wilk normality test on the residuals passed after square root transformation. Alpha = 0.01, calculated = 0.9895, critical = 0.868. Levene's Equality of Variance test passed. Calculated = 0.3135, tabulated = 4.41.

## Non-Parametric ANOVA

Constituent: Fluoride Analysis Run 1/2/2018 10:36 PM View: ANOVA  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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For observations made between 1/25/2017 and 10/4/2017, 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 = 4.151

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

There were 1 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) = 3.465

Adjusted Kruskal-Wallis statistic (H') = 4.151

# Parametric ANOVA

Constituent: pH, field Analysis Run 1/2/2018 10:36 PM View: ANOVA  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

For observations made between 1/25/2017 and 10/4/2017 the parametric analysis of variance test (after natural log transformation) indicates NO VARIATION at the 5% significance level. Because the calculated F statistic is less than or equal to the tabulated F statistic, the hypothesis of a single homogeneous population is accepted.

Calculated F statistic = 2.314

Tabulated F statistic = 4.49 with 1 and 16 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	1.7e9	1	1.7e9	1525
Error Within Groups	2.1e7	18	1140393	
Total	1.8e9	19		

The Shapiro Wilk normality test on the residuals passed after natural log transformation. Alpha = 0.05, calculated = 0.9074, critical = 0.897. Levene's Equality of Variance test passed. Calculated = 4.417, tabulated = 4.49.

## Non-Parametric ANOVA

Constituent: Sulfate Analysis Run 1/2/2018 10:36 PM View: ANOVA  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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For observations made between 1/25/2017 and 10/4/2017, 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 = 14.15

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

There were 1 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) = 14.14

Adjusted Kruskal-Wallis statistic (H') = 14.15

# Parametric ANOVA

Constituent: Total Dissolve Solids [TDS] Analysis Run 1/2/2018 10:36 PM View: ANOVA  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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For observations made between 1/25/2017 and 10/4/2017 the parametric analysis of variance test 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 = 1525

Tabulated F statistic = 4.41 with 1 and 18 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	1.7e9	1	1.7e9	1525
Error Within Groups	2.1e7	18	1140393	
Total	1.8e9	19		

The Shapiro Wilk normality test on the residuals passed on the raw data. Alpha = 0.01, calculated = 0.9568, critical = 0.868. Levene's Equality of Variance test passed. Calculated = 3.197, tabulated = 4.41.

# Tolerance Limits - Appendix A

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 1/2/2018, 10:38 PM

<u>Constituent</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Bg N</u>	<u>Bg Mean</u>	<u>Std. Dev.</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	1.596	n/a	20	1.261	0.1194	0	None	No	0.01	Inter
Calcium (mg/L)	1028	n/a	20	379.7	230.8	0	None	No	0.01	Inter
Chloride (mg/L)	14606	n/a	20	n/a	n/a	0	n/a	n/a	0.3585	NP Inter(normality)
Fluoride (mg/L)	3.248	n/a	20	n/a	n/a	55	n/a	n/a	0.3585	NP Inter(normality)
pH, field (SU)	8.28	6.72	18	n/a	n/a	0	n/a	n/a	0.7735	NP Inter(normality)
Sulfate (mg/L)	1632	n/a	20	n/a	n/a	0	n/a	n/a	0.3585	NP Inter(normality)
Total Dissolve Solids [TDS] (mg/L)	23012	n/a	20	n/a	n/a	0	n/a	n/a	0.3585	NP Inter(normality)



# Confidence Interval Summary Table - Significant Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 3/6/2019, 11:06 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance Sig.	N	%NDs	Transform	Alpha	Method
Boron (mg/L)	MW-15	9.88	9.177	1.4	Yes 12	0	x^3	0.01	Param.
Boron (mg/L)	MW-6D	3.767	2.818	1.4	Yes 8	0	x^4	0.01	Param.
Boron (mg/L)	MW-9D	7.537	6.756	1.4	Yes 8	0	No	0.01	Param.
Boron (mg/L)	MW-12D	9.406	8.445	1.4	Yes 9	0	No	0.01	Param.

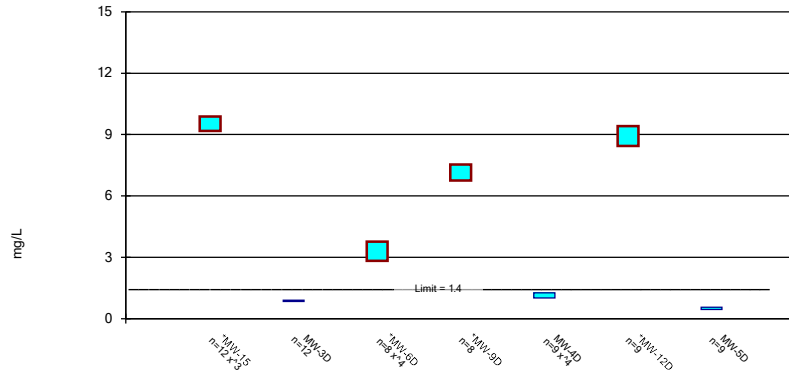
# Confidence Interval Summary Table - All Results

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 3/6/2019, 11:06 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance Sig.	N	%NDs	Transform	Alpha	Method
<b>Boron (mg/L)</b>	<b>MW-15</b>	<b>9.88</b>	<b>9.177</b>	<b>1.4</b>	<b>Yes 12</b>	<b>0</b>	<b>x^3</b>	<b>0.01</b>	<b>Param.</b>
Boron (mg/L)	MW-3D	0.9067	0.8328	1.4	No 12	0	No	0.01	Param.
<b>Boron (mg/L)</b>	<b>MW-6D</b>	<b>3.767</b>	<b>2.818</b>	<b>1.4</b>	<b>Yes 8</b>	<b>0</b>	<b>x^4</b>	<b>0.01</b>	<b>Param.</b>
<b>Boron (mg/L)</b>	<b>MW-9D</b>	<b>7.537</b>	<b>6.756</b>	<b>1.4</b>	<b>Yes 8</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Boron (mg/L)	MW-4D	1.262	1.017	1.4	No 9	0	x^4	0.01	Param.
<b>Boron (mg/L)</b>	<b>MW-12D</b>	<b>9.406</b>	<b>8.445</b>	<b>1.4</b>	<b>Yes 9</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Boron (mg/L)	MW-5D	0.5487	0.4442	1.4	No 9	0	No	0.01	Param.
Calcium (mg/L)	MW-15	101	67.59	918	No 12	0	No	0.01	Param.
Calcium (mg/L)	MW-3D	156.8	120.5	918	No 12	0	No	0.01	Param.
Calcium (mg/L)	MW-6D	233	173.9	918	No 8	0	x^2	0.01	Param.
Calcium (mg/L)	MW-9D	362.6	225.6	918	No 8	0	No	0.01	Param.
Calcium (mg/L)	MW-4D	198.2	175	918	No 10	0	No	0.01	Param.
Calcium (mg/L)	MW-12D	135.2	69.95	918	No 10	0	No	0.01	Param.
Calcium (mg/L)	MW-5D	152.5	132.7	918	No 10	0	No	0.01	Param.
Chloride (mg/L)	MW-15	28	15	14606	No 11	0	No	0.006	NP (normality)
Chloride (mg/L)	MW-3D	13.97	11.49	14606	No 11	0	No	0.01	Param.
Chloride (mg/L)	MW-6D	31.72	28.78	14606	No 8	0	No	0.01	Param.
Chloride (mg/L)	MW-9D	247.5	63.23	14606	No 8	0	No	0.01	Param.
Chloride (mg/L)	MW-4D	34.07	21.59	14606	No 10	0	No	0.01	Param.
Chloride (mg/L)	MW-12D	20.8	15.64	14606	No 9	0	No	0.01	Param.
Chloride (mg/L)	MW-5D	30.3	24	14606	No 9	0	No	0.002	NP (normality)
Fluoride (mg/L)	MW-15	1.991	1.774	4	No 11	0	No	0.01	Param.
Fluoride (mg/L)	MW-3D	1	0.7381	4	No 12	50	No	0.01	NP (normality)
Fluoride (mg/L)	MW-6D	1.013	0.6152	4	No 8	25	No	0.01	Param.
Fluoride (mg/L)	MW-9D	2.191	0.37	4	No 8	25	No	0.004	NP (Cohens/xfrm)
Fluoride (mg/L)	MW-4D	1	0.336	4	No 10	70	No	0.011	NP (normality)
Fluoride (mg/L)	MW-12D	2.744	2.07	4	No 10	0	No	0.01	Param.
Fluoride (mg/L)	MW-5D	0.8521	0.5226	4	No 9	0	x^2	0.01	Param.
pH, field (SU)	MW-15	8.412	7.292	8.28	No 10	0	No	0.005	Param.
pH, field (SU)	MW-3D	7.499	6.705	8.28	No 10	0	sqrt(x)	0.005	Param.
pH, field (SU)	MW-6D	7.706	6.599	8.28	No 8	0	No	0.005	Param.
pH, field (SU)	MW-9D	7.5	7.012	8.28	No 8	0	No	0.005	Param.
pH, field (SU)	MW-4D	8.048	7.302	8.28	No 10	0	No	0.005	Param.
pH, field (SU)	MW-12D	9.138	7.78	8.28	No 10	0	No	0.005	Param.
pH, field (SU)	MW-5D	8.215	7.491	8.28	No 10	0	No	0.005	Param.
Sulfate (mg/L)	MW-15	603.5	553.7	1632	No 12	0	No	0.01	Param.
Sulfate (mg/L)	MW-3D	221.9	190	1632	No 12	0	No	0.01	Param.
Sulfate (mg/L)	MW-6D	526.7	504.6	1632	No 8	0	No	0.01	Param.
Sulfate (mg/L)	MW-9D	1259	898.2	1632	No 8	0	No	0.01	Param.
Sulfate (mg/L)	MW-4D	341.1	251.7	1632	No 10	0	No	0.01	Param.
Sulfate (mg/L)	MW-12D	598.9	498	1632	No 9	0	No	0.01	Param.
Sulfate (mg/L)	MW-5D	662	113	1632	No 9	0	No	0.002	NP (normality)
Total Dissolved Solids [TDS] (mg/L)	MW-15	1104	1053	23012	No 12	0	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-3D	759.5	658.5	23012	No 12	0	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-6D	1140	986	23012	No 8	0	No	0.004	NP (normality)
Total Dissolved Solids [TDS] (mg/L)	MW-9D	2717	1527	23012	No 8	0	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-4D	944.8	848.2	23012	No 9	0	x^(1/3)	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-12D	1098	1035	23012	No 9	0	No	0.01	Param.
Total Dissolved Solids [TDS] (mg/L)	MW-5D	656	621.5	23012	No 8	0	No	0.01	Param.

### Parametric Confidence Interval

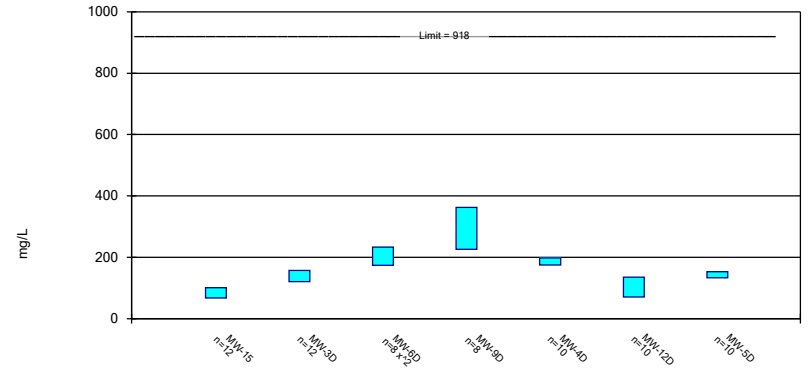
Compliance limit is exceeded.\* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Boron Analysis Run 3/6/2019 11:00 AM View: Confidence Intervals - App III  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Parametric Confidence Interval

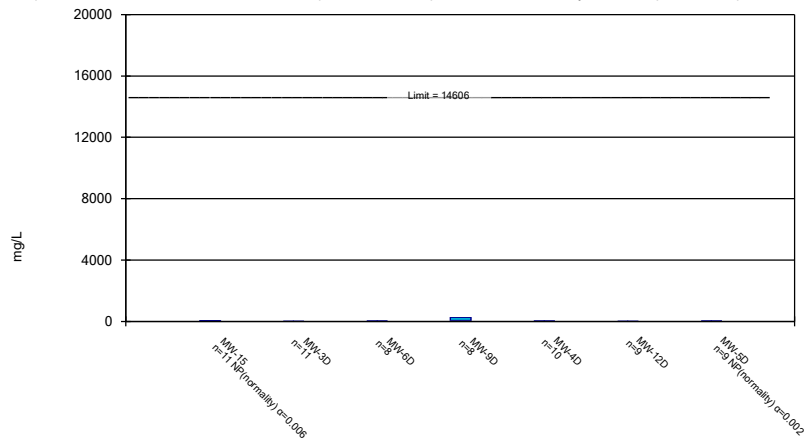
Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Calcium Analysis Run 3/6/2019 11:00 AM View: Confidence Intervals - App III  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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

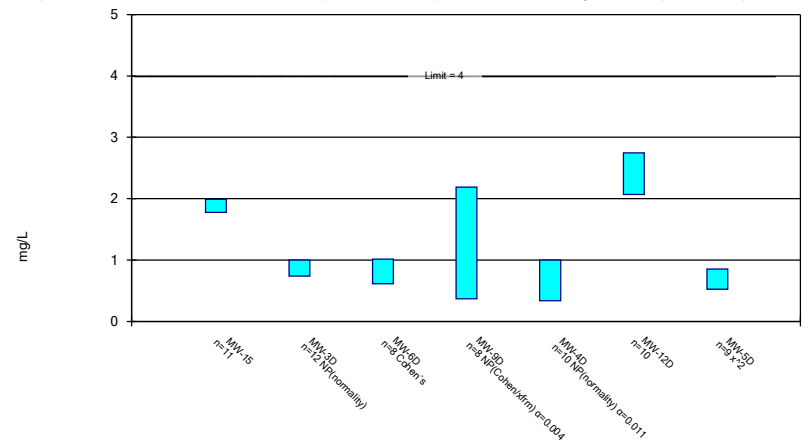
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Chloride Analysis Run 3/6/2019 11:00 AM View: Confidence Intervals - App III  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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

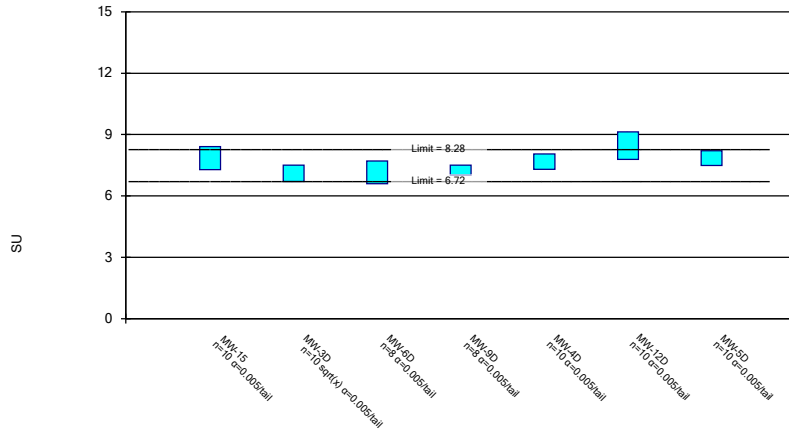
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride Analysis Run 3/6/2019 11:00 AM View: Confidence Intervals - App III  
Northeastern LF Client: Geosyntec Data: Northeastern LF

### Parametric Confidence Interval

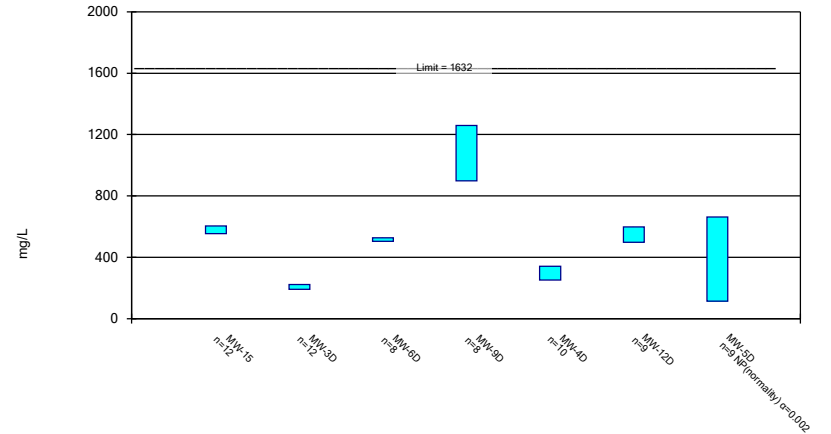
Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: pH, field Analysis Run 3/6/2019 11:00 AM View: Confidence Intervals - App III  
Northeastern LF Client: Geosyntec Data: Northeastern LF

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

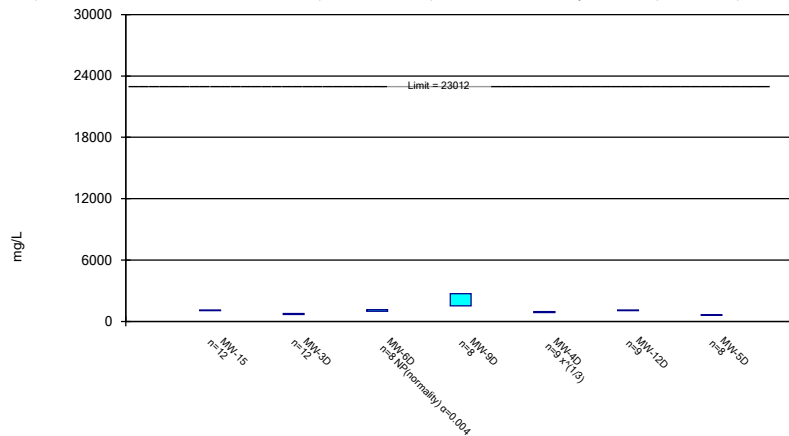
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Sulfate Analysis Run 3/6/2019 11:00 AM View: Confidence Intervals - App III  
Northeastern LF 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: Total Dissolved Solids [TDS] Analysis Run 3/6/2019 11:00 AM View: Confidence Intervals - A  
Northeastern LF Client: Geosyntec Data: Northeastern LF

# Intrawell Prediction Limit Summary

Northeastern LF    Client: Geosyntec    Data: Northeastern LF    Printed 7/18/2019, 3:45 PM

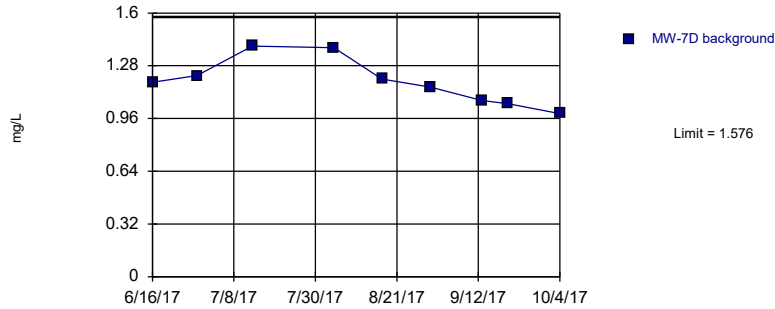
Constituent	Well	Upper Lim.	Lower Lim.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (mg/L)	MW-7D	1.576	n/a	9	1.183	0.1416	0	None	No	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-8D	1.415	n/a	11	1.324	0.03585	0	None	No	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-15	10.7	n/a	12	9.52	0.482	0	None	No	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-3D	0.9852	n/a	12	0.8698	0.04713	0	None	No	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-6D	4.438	n/a	8	37.54	17.06	0	None	x^3	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-9D	8.223	n/a	8	7.146	0.3683	0	None	No	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-4D	1.521	n/a	9	1.298	0.3662	0	None	x^2	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-12D	10.3	n/a	9	8.926	0.4975	0	None	No	0.001075	Param Intra 1 of 2
Boron (mg/L)	MW-5D	0.6465	n/a	9	0.4964	0.05414	0	None	No	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-7D	1288	n/a	9	5.235	0.6946	0	None	ln(x)	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-8D	854.2	n/a	11	7.815	0.6602	0	None	x^(1/3)	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-15	136.4	n/a	12	84.28	21.28	0	None	No	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-3D	195.3	n/a	12	138.7	23.13	0	None	No	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-6D	294.6	n/a	8	203.5	31.18	0	None	No	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-9D	483	n/a	8	294.1	64.61	0	None	No	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-4D	220.6	n/a	10	186.6	12.99	0	None	No	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-12D	198.4	n/a	10	102.6	36.57	0	None	No	0.001075	Param Intra 1 of 2
Calcium (mg/L)	MW-5D	171.6	n/a	10	142.6	11.06	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-7D	890	n/a	9	355.4	192.9	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-8D	14942	n/a	11	11986	1166	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-15	78	n/a	11	n/a	n/a	0	n/a	n/a	0.01276	NP Intra (normality) 1 of 2
Chloride (mg/L)	MW-3D	16.5	n/a	11	12.73	1.489	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-6D	34.31	n/a	8	30.25	1.389	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-9D	409.4	n/a	8	155.4	86.93	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-4D	46.16	n/a	10	27.83	6.996	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-12D	25.63	n/a	9	18.22	2.671	0	None	No	0.001075	Param Intra 1 of 2
Chloride (mg/L)	MW-5D	35.32	n/a	9	27.06	2.981	0	None	No	0.001075	Param Intra 1 of 2
Fluoride (mg/L)	MW-7D	4.146	n/a	9	1.818	0.8399	11.11	None	No	0.001075	Param Intra 1 of 2
Fluoride (mg/L)	MW-8D	1	n/a	11	n/a	n/a	90.91	n/a	n/a	0.01276	NP Intra (NDs) 1 of 2
Fluoride (mg/L)	MW-15	2.212	n/a	11	1.883	0.1298	0	None	No	0.001075	Param Intra 1 of 2
Fluoride (mg/L)	MW-3D	1	n/a	12	n/a	n/a	50	n/a	n/a	0.01077	NP Intra (normality) 1 of 2
Fluoride (mg/L)	MW-6D	0.9674	n/a	8	0.7193	0.08487	25	Kaplan-Meier	No	0.001075	Param Intra 1 of 2
Fluoride (mg/L)	MW-9D	2.44	n/a	8	0.9091	0.5239	25	Kaplan-Meier	No	0.001075	Param Intra 1 of 2
Fluoride (mg/L)	MW-4D	1	n/a	10	n/a	n/a	70	n/a	n/a	0.01476	NP Intra (NDs) 1 of 2
Fluoride (mg/L)	MW-12D	3.398	n/a	10	2.407	0.3782	0	None	No	0.001075	Param Intra 1 of 2
Fluoride (mg/L)	MW-5D	1.237	n/a	9	0.6811	0.2004	0	None	No	0.001075	Param Intra 1 of 2
pH, field (SU)	MW-7D	8.636	6.013	9	7.324	0.4731	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-8D	7.469	6.674	9	7.071	0.1434	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-15	9.279	6.425	10	7.852	0.5446	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-3D	8.127	6.075	10	7.101	0.3915	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-6D	8.46	5.845	8	7.153	0.4475	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-9D	7.833	6.68	8	7.256	0.1972	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-4D	8.626	6.724	10	7.675	0.3629	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-12D	10.19	6.726	10	8.459	0.6611	0	None	No	0.0005373	Param Intra 1 of 2
pH, field (SU)	MW-5D	8.777	6.929	10	7.853	0.3525	0	None	No	0.0005373	Param Intra 1 of 2
Sulfate (mg/L)	MW-7D	2044	n/a	9	881.6	419.4	0	None	No	0.001075	Param Intra 1 of 2
Sulfate (mg/L)	MW-8D	172.4	n/a	11	109.6	24.76	0	None	No	0.001075	Param Intra 1 of 2
Sulfate (mg/L)	MW-15	656.3	n/a	12	578.6	31.72	0	None	No	0.001075	Param Intra 1 of 2
Sulfate (mg/L)	MW-3D	255.7	n/a	12	205.9	20.34	0	None	No	0.001075	Param Intra 1 of 2
Sulfate (mg/L)	MW-6D	546	n/a	8	515.6	10.41	0	None	No	0.001075	Param Intra 1 of 2

# Intrawell Prediction Limit Summary

Northeastern LF Client: Geosyntec Data: Northeastern LF Printed 7/18/2019, 3:45 PM

Constituent	Well	Upper Lim.	Lower Lim.	Bg N	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Sulfate (mg/L)	MW-9D	1576	n/a	8	1079	170.3	0	None	No	0.001075	Param Intra 1 of 2
Sulfate (mg/L)	MW-4D	427.6	n/a	10	296.4	50.08	0	None	No	0.001075	Param Intra 1 of 2
Sulfate (mg/L)	MW-12D	693.2	n/a	9	548.4	52.22	0	None	No	0.001075	Param Intra 1 of 2
Sulfate (mg/L)	MW-5D	159.6	n/a	8	130.4	10.01	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-7D	4809	n/a	9	2690	764.7	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-8D	24623	n/a	11	21432	1259	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-15	1159	n/a	12	1079	32.67	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-3D	866.7	n/a	12	709	64.4	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-6D	1173	n/a	8	1037	46.63	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-9D	3763	n/a	8	2122	561.5	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-4D	1037	n/a	9	896.4	50.69	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-12D	1158	n/a	9	1067	32.79	0	None	No	0.001075	Param Intra 1 of 2
Total Dissolved Solids [TDS] (mg/L)	MW-5D	686.3	n/a	8	638.8	16.28	0	None	No	0.001075	Param Intra 1 of 2

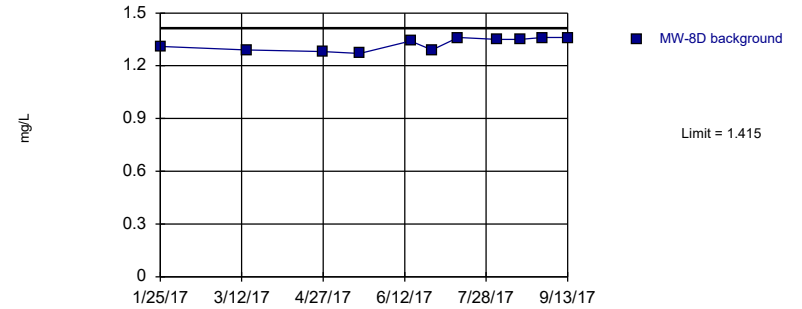
Prediction Limit  
Intrawell Parametric, MW-7D (bg)



Background Data Summary: Mean=1.183, Std. Dev.=0.1416, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9293, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:40 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

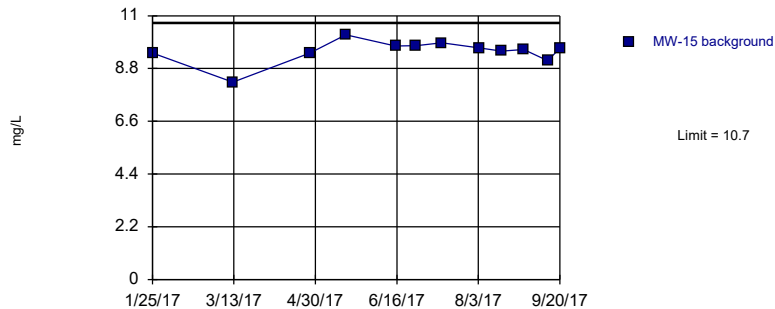
Prediction Limit  
Intrawell Parametric, MW-8D (bg)



Background Data Summary: Mean=1.324, Std. Dev.=0.03585, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8431, critical = 0.792. Kappa = 2.535 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:40 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

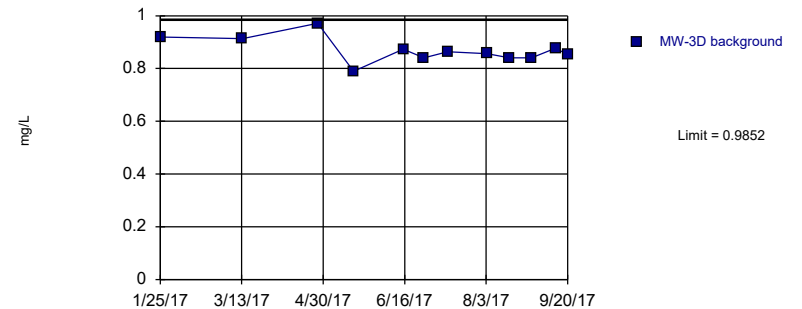
Prediction Limit  
Intrawell Parametric, MW-15



Background Data Summary: Mean=9.52, Std. Dev.=0.482, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.831, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

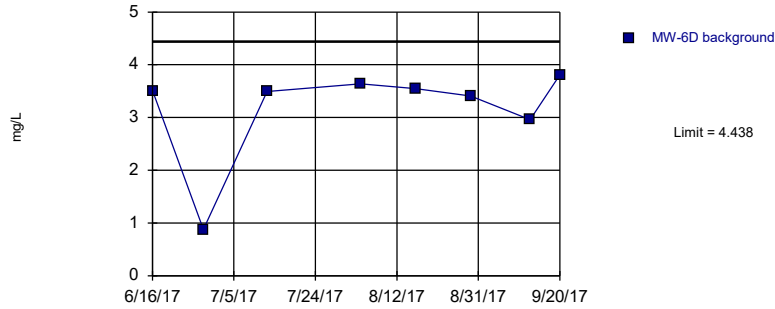
Prediction Limit  
Intrawell Parametric, MW-3D



Background Data Summary: Mean=0.8698, Std. Dev.=0.04713, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.938, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

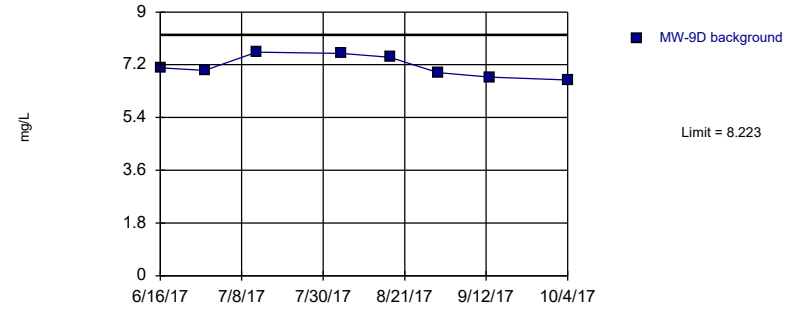
Prediction Limit  
Intrawell Parametric, MW-6D



Background Data Summary (based on cube transformation): Mean=37.54, Std. Dev.=17.06, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.827, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

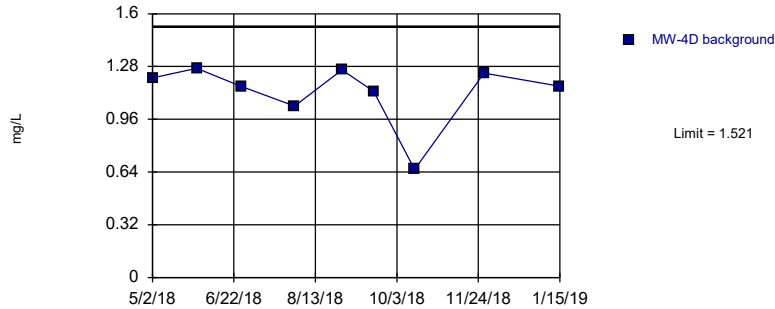
Prediction Limit  
Intrawell Parametric, MW-9D



Background Data Summary: Mean=7.146, Std. Dev.=0.3683, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9073, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

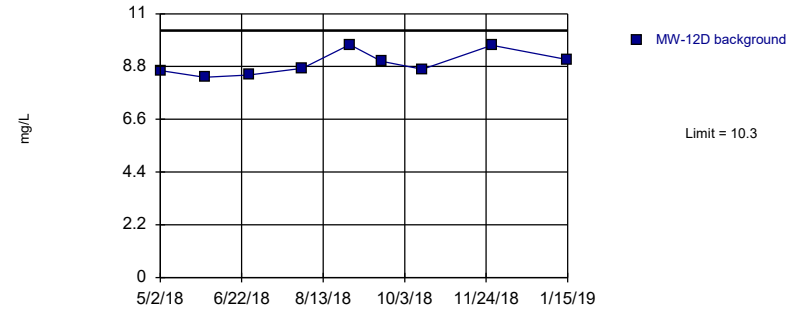
Prediction Limit  
Intrawell Parametric, MW-4D



Background Data Summary (based on square transformation): Mean=1.298, Std. Dev.=0.3662, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7945, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Prediction Limit  
Intrawell Parametric, MW-12D

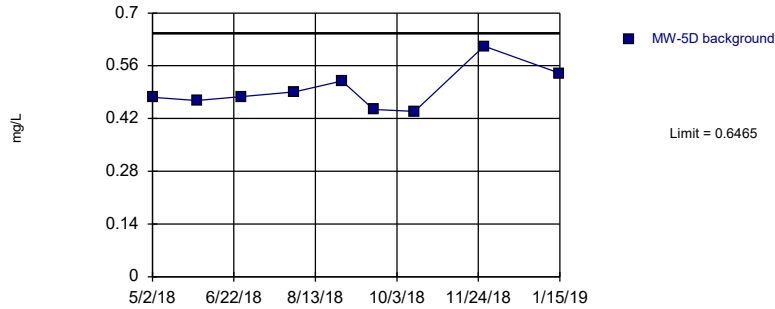


Background Data Summary: Mean=8.926, Std. Dev.=0.4975, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8856, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF



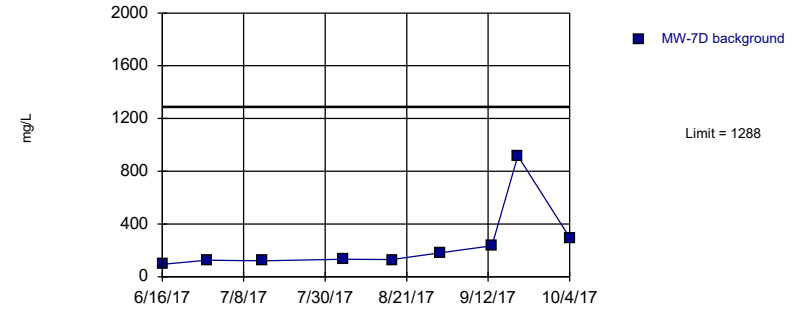
Prediction Limit  
Intrawell Parametric, MW-5D



Background Data Summary: Mean=0.4964, Std. Dev.=0.05414, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8928, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Boron Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

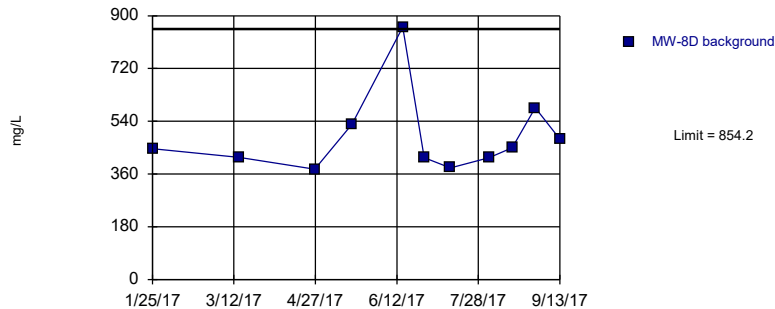
Prediction Limit  
Intrawell Parametric, MW-7D (bg)



Background Data Summary (based on natural log transformation): Mean=5.235, Std. Dev.=0.6946, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8257, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

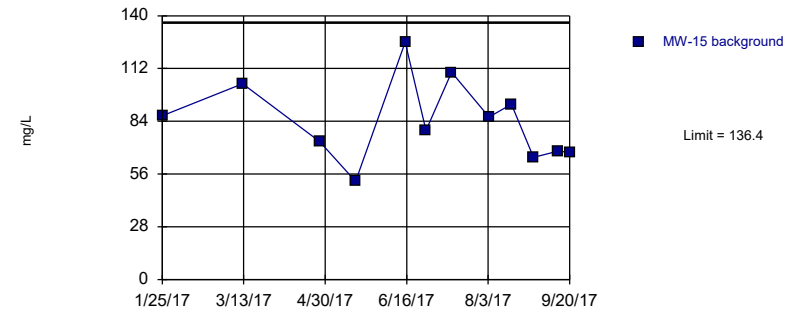
Prediction Limit  
Intrawell Parametric, MW-8D (bg)



Background Data Summary (based on cube root transformation): Mean=7.815, Std. Dev.=0.6602, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7955, critical = 0.792. Kappa = 2.535 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

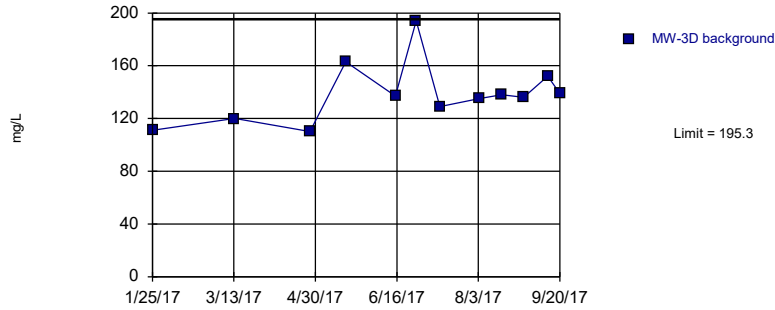
Prediction Limit  
Intrawell Parametric, MW-15



Background Data Summary: Mean=84.28, Std. Dev.=21.28, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9679, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

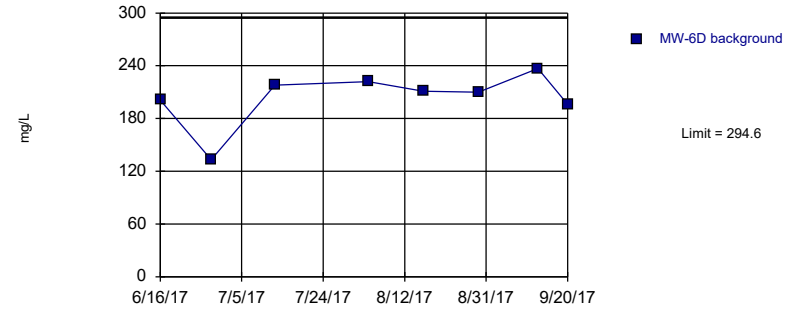
Prediction Limit  
Intrawell Parametric, MW-3D



Background Data Summary: Mean=138.7, Std. Dev.=23.13, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8977, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

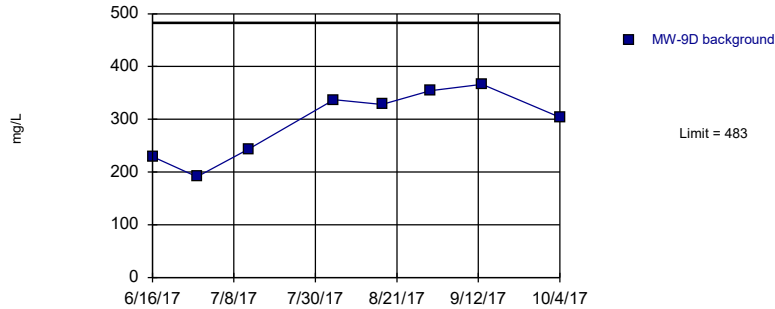
Prediction Limit  
Intrawell Parametric, MW-6D



Background Data Summary: Mean=203.5, Std. Dev.=31.18, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8086, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

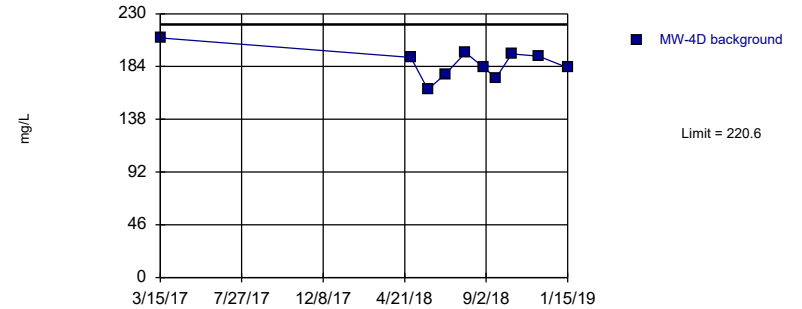
Prediction Limit  
Intrawell Parametric, MW-9D



Background Data Summary: Mean=294.1, Std. Dev.=64.61, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9094, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

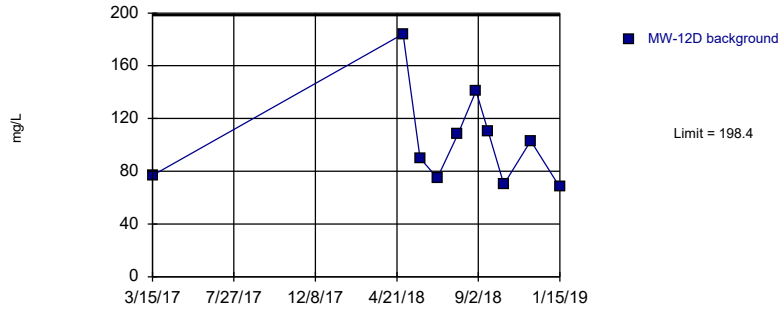
Prediction Limit  
Intrawell Parametric, MW-4D



Background Data Summary: Mean=186.6, Std. Dev.=12.99, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9763, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

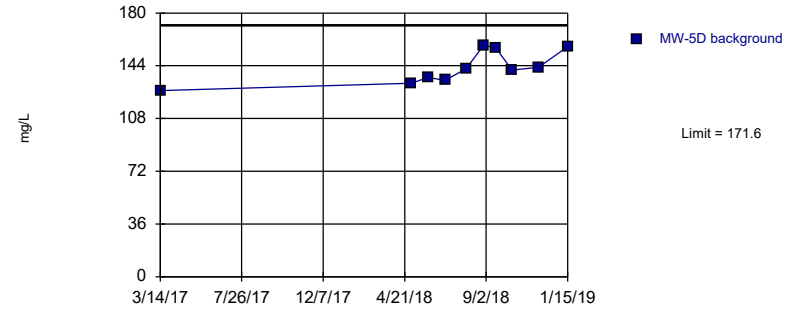
Prediction Limit  
Intrawell Parametric, MW-12D



Background Data Summary: Mean=102.6, Std. Dev.=36.57, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8609, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

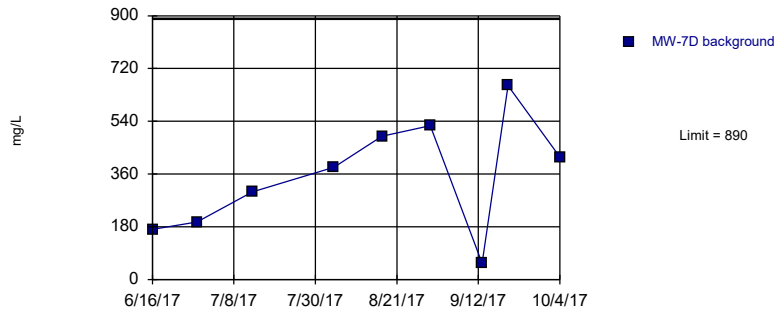
Prediction Limit  
Intrawell Parametric, MW-5D



Background Data Summary: Mean=142.6, Std. Dev.=11.06, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9089, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Calcium Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

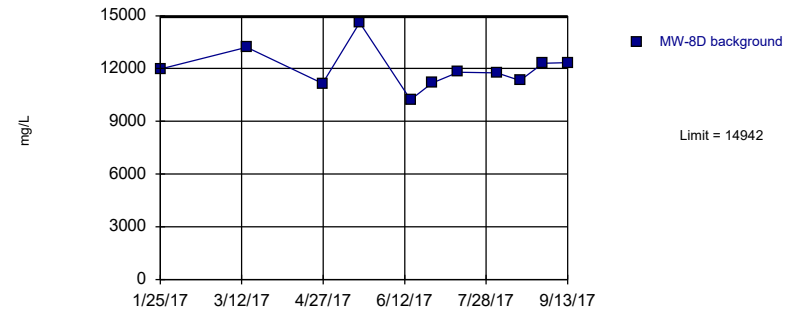
Prediction Limit  
Intrawell Parametric, MW-7D (bg)



Background Data Summary: Mean=355.4, Std. Dev.=192.9, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.983, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

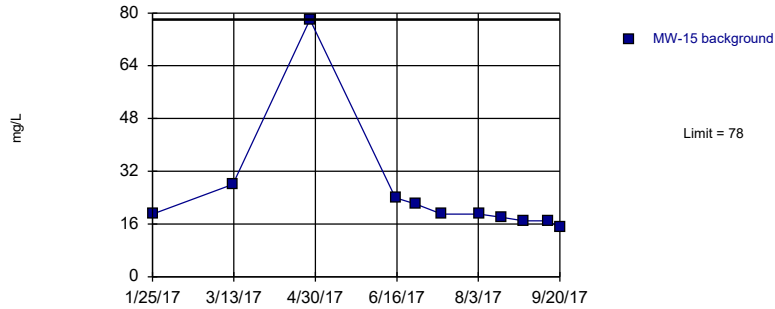
Prediction Limit  
Intrawell Parametric, MW-8D (bg)



Background Data Summary: Mean=11986, Std. Dev.=1166, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9298, critical = 0.792. Kappa = 2.535 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

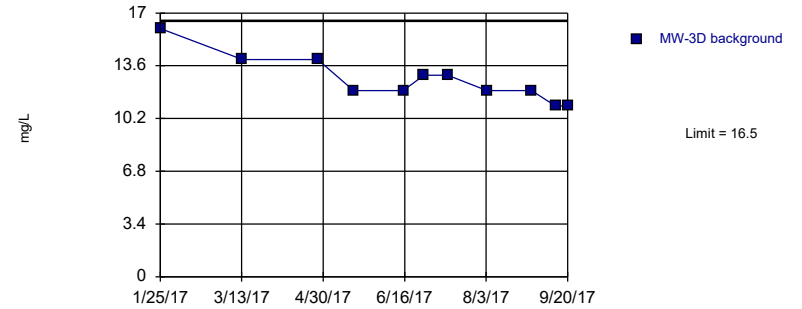
Prediction Limit  
Intrawell Non-parametric, MW-15



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 0.01 alpha level. Limit is highest of 11 background values. Well-constituent pair annual alpha = 0.02537. Individual comparison alpha = 0.01276 (1 of 2). Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

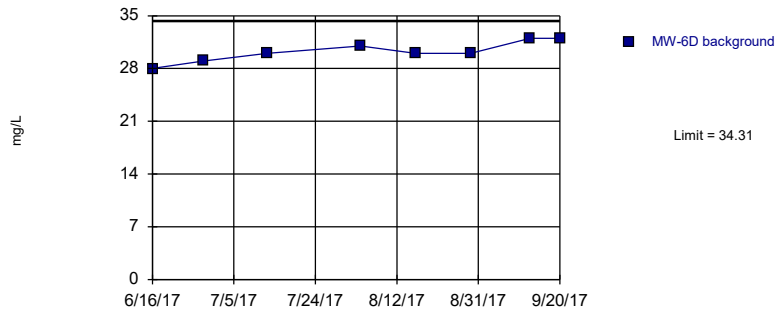
Prediction Limit  
Intrawell Parametric, MW-3D



Background Data Summary: Mean=12.73, Std. Dev.=1.489, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8965, critical = 0.792. Kappa = 2.535 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

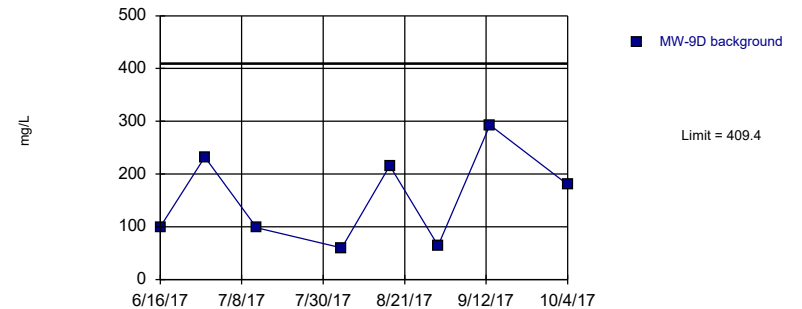
Prediction Limit  
Intrawell Parametric, MW-6D



Background Data Summary: Mean=30.25, Std. Dev.=1.389, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9305, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

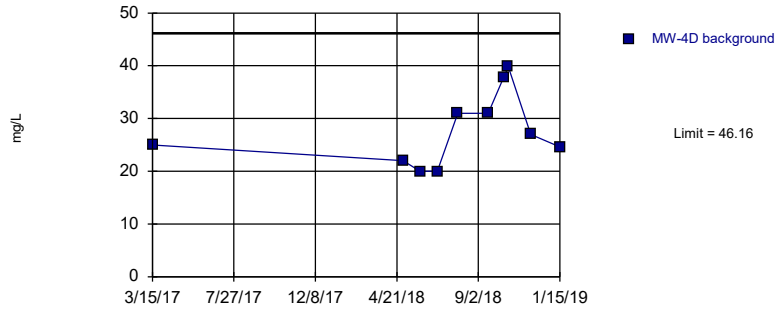
Prediction Limit  
Intrawell Parametric, MW-9D



Background Data Summary: Mean=155.4, Std. Dev.=86.93, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9085, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

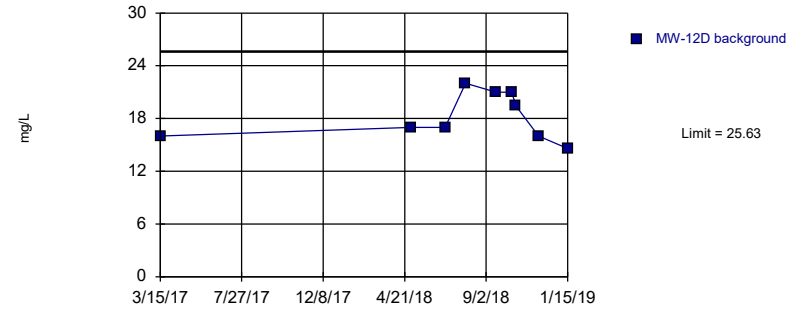
Prediction Limit  
Intrawell Parametric, MW-4D



Background Data Summary: Mean=27.83, Std. Dev.=6.996, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.912, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

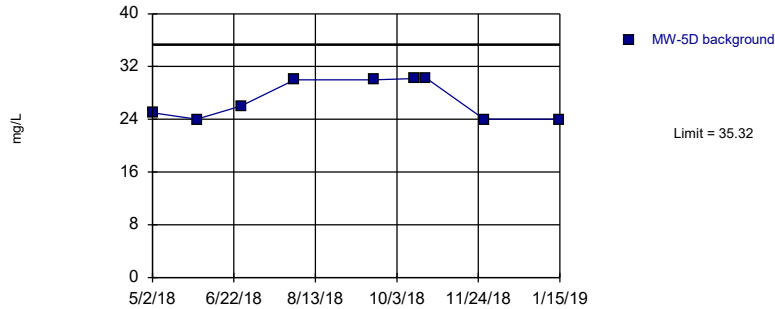
Prediction Limit  
Intrawell Parametric, MW-12D



Background Data Summary: Mean=18.22, Std. Dev.=2.671, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9069, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

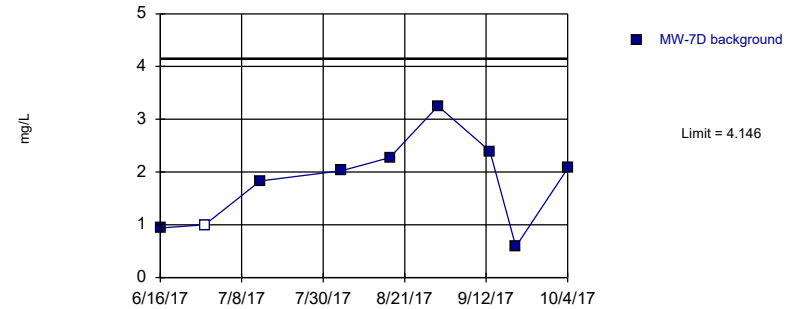
Prediction Limit  
Intrawell Parametric, MW-5D



Background Data Summary: Mean=27.06, Std. Dev.=2.981, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.766, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Chloride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

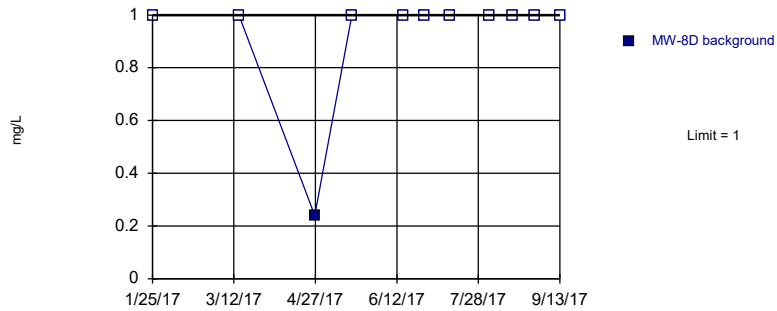
Prediction Limit  
Intrawell Parametric, MW-7D (bg)



Background Data Summary: Mean=1.818, Std. Dev.=0.8399, n=9, 11.11% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9474, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:41 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

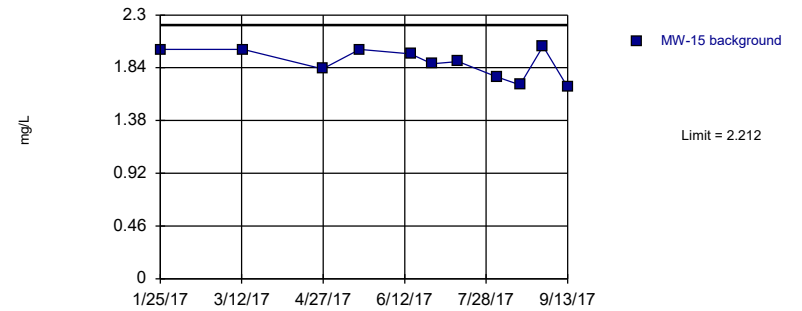
Prediction Limit  
 Intrawell Non-parametric, MW-8D (bg)



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 11 background values. 90.91% NDs. Well-constituent pair annual alpha = 0.02537. Individual comparison alpha = 0.01276 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

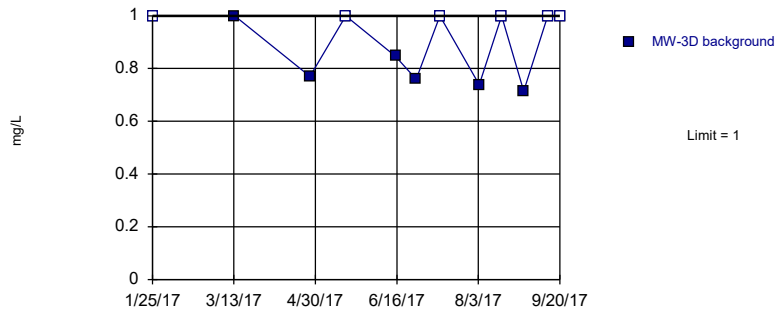
Prediction Limit  
 Intrawell Parametric, MW-15



Background Data Summary: Mean=1.883, Std. Dev.=0.1298, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8919, critical = 0.792. Kappa = 2.535 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

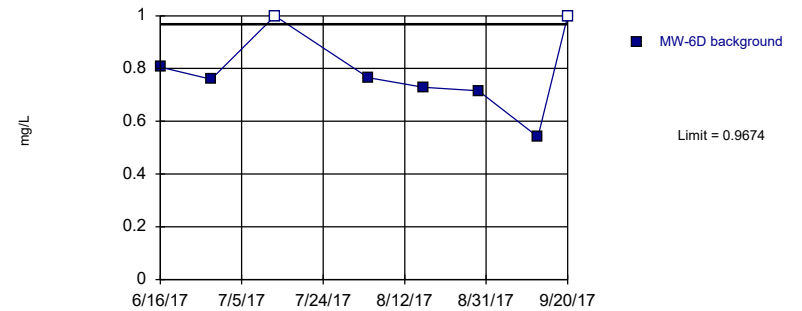
Prediction Limit  
 Intrawell Non-parametric, MW-3D



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 12 background values. 50% NDs. Well-constituent pair annual alpha = 0.02143. Individual comparison alpha = 0.01077 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

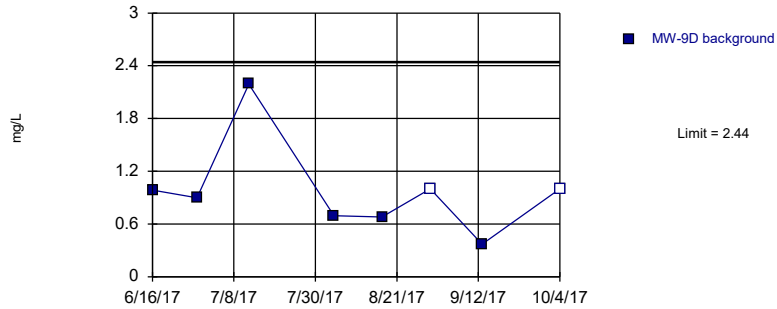
Prediction Limit  
 Intrawell Parametric, MW-6D



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.7193, Std. Dev.=0.08487, n=8, 25% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9023, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
 Northeastern LF Client: Geosyntec Data: Northeastern LF

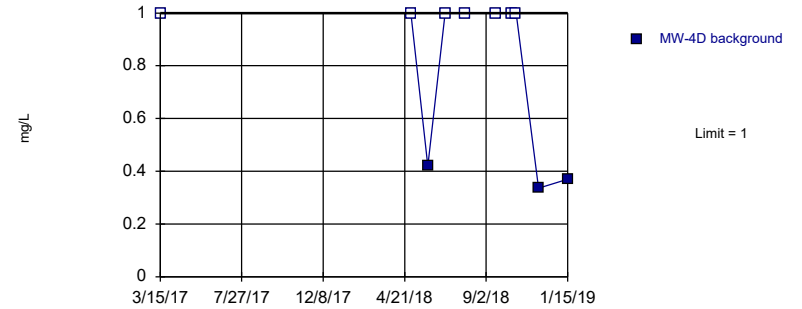
Prediction Limit  
Intrawell Parametric, MW-9D



Background Data Summary (after Kaplan-Meier Adjustment): Mean=0.9091, Std. Dev.=0.5239, n=8, 25% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.7886, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

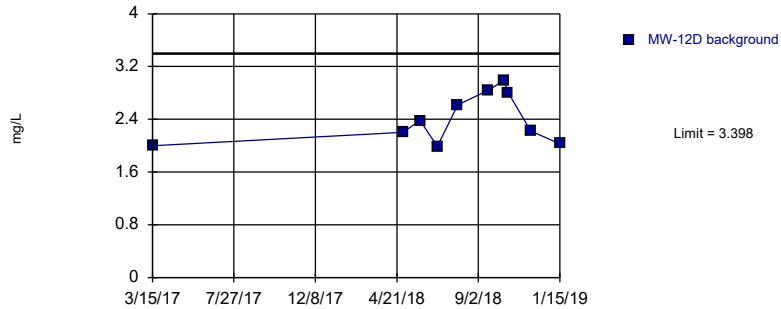
Prediction Limit  
Intrawell Non-parametric, MW-4D



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 10 background values. 70% NDs. Well-constituent pair annual alpha = 0.0293. Individual comparison alpha = 0.01476 (1 of 2). Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

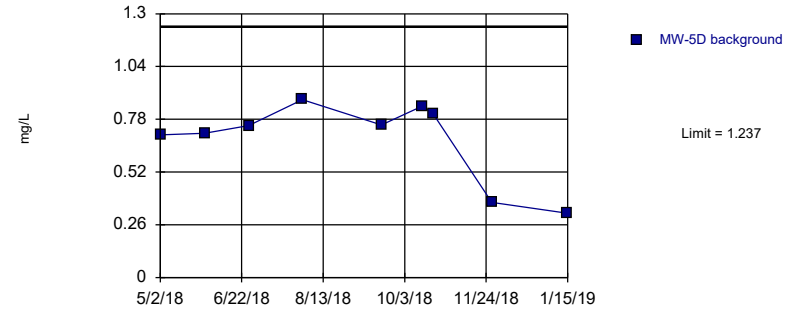
Prediction Limit  
Intrawell Parametric, MW-12D



Background Data Summary: Mean=2.407, Std. Dev.=0.3782, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8943, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

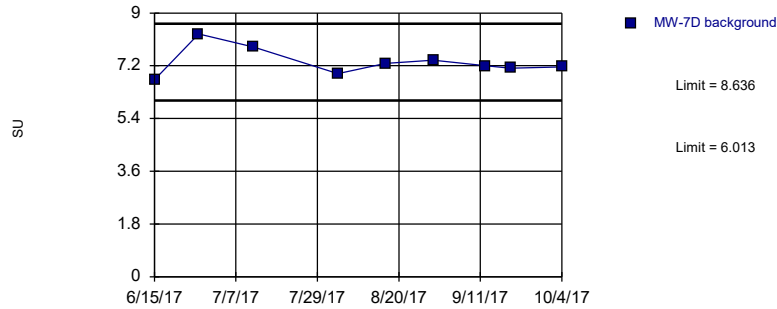
Prediction Limit  
Intrawell Parametric, MW-5D



Background Data Summary: Mean=0.6811, Std. Dev.=0.2004, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8042, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Fluoride Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

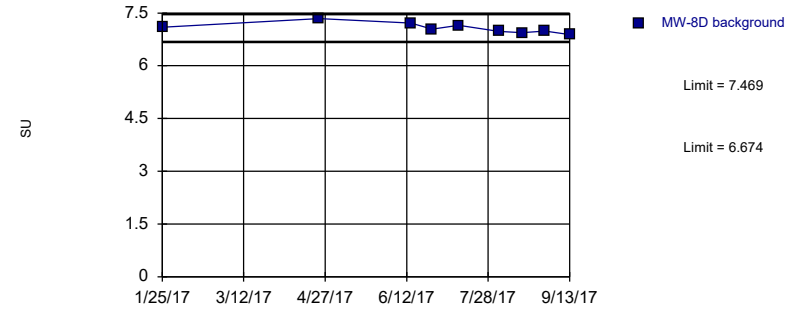
Prediction Limit  
Intrawell Parametric, MW-7D (bg)



Background Data Summary: Mean=7.324, Std. Dev.=0.4731, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9129, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

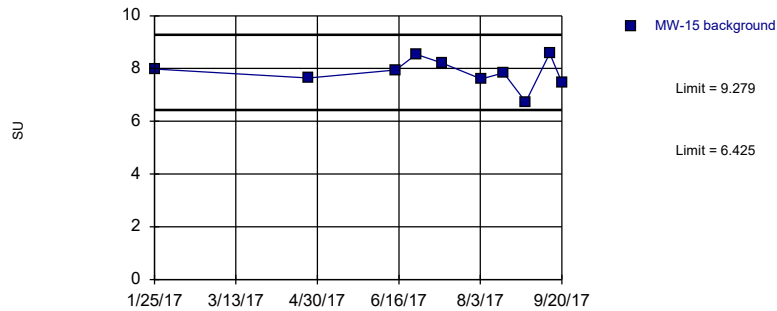
Prediction Limit  
Intrawell Parametric, MW-8D (bg)



Background Data Summary: Mean=7.071, Std. Dev.=0.1434, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.956, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

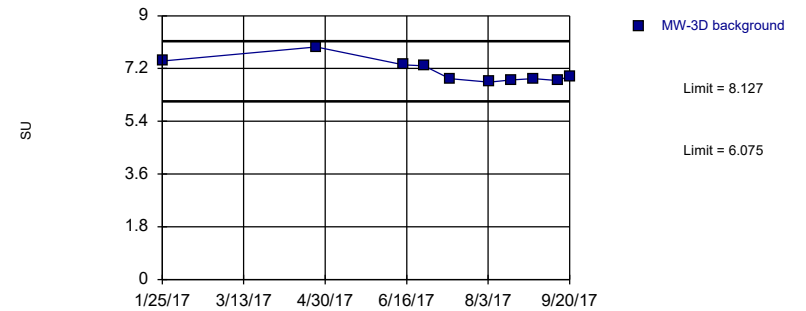
Prediction Limit  
Intrawell Parametric, MW-15



Background Data Summary: Mean=7.852, Std. Dev.=0.5446, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9476, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Prediction Limit  
Intrawell Parametric, MW-3D

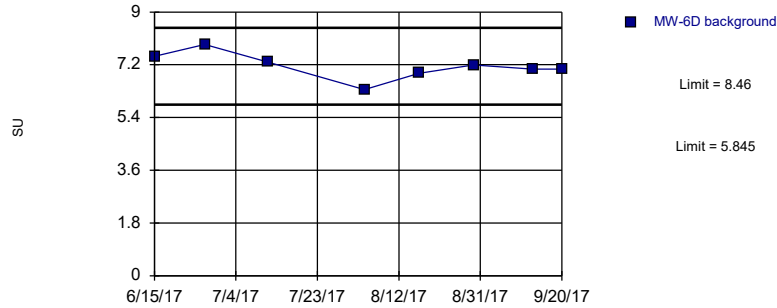


Background Data Summary: Mean=7.101, Std. Dev.=0.3915, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8416, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF



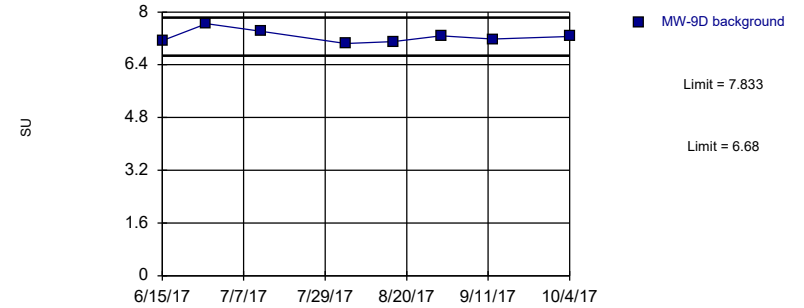
Prediction Limit  
Intrawell Parametric, MW-6D



Background Data Summary: Mean=7.153, Std. Dev.=0.4475, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9684, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

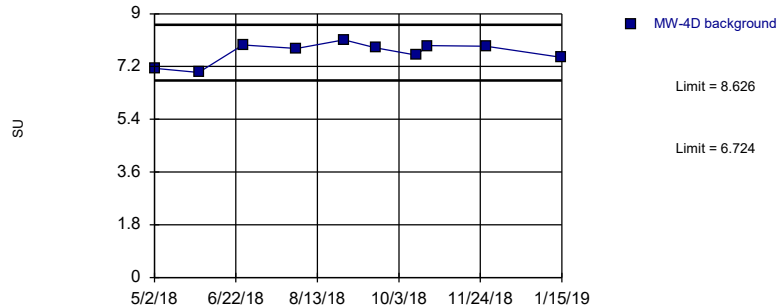
Prediction Limit  
Intrawell Parametric, MW-9D



Background Data Summary: Mean=7.256, Std. Dev.=0.1972, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9107, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

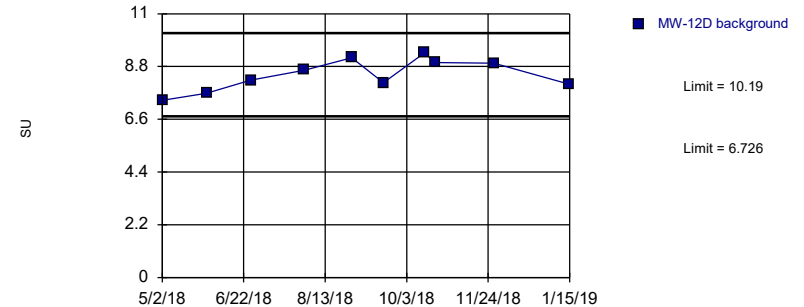
Prediction Limit  
Intrawell Parametric, MW-4D



Background Data Summary: Mean=7.675, Std. Dev.=0.3629, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8836, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

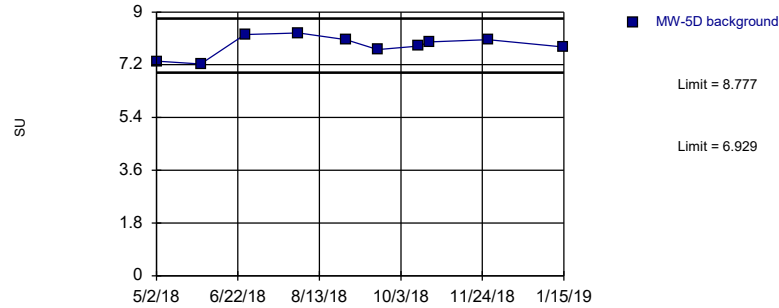
Prediction Limit  
Intrawell Parametric, MW-12D



Background Data Summary: Mean=8.459, Std. Dev.=0.6611, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9542, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

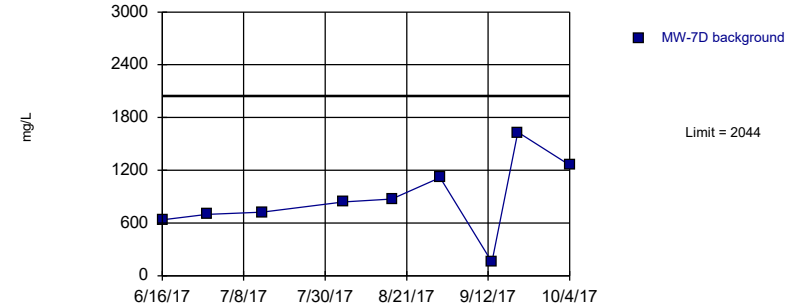
Prediction Limit  
Intrawell Parametric, MW-5D



Background Data Summary: Mean=7.853, Std. Dev.=0.3525, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9142, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: pH, field Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

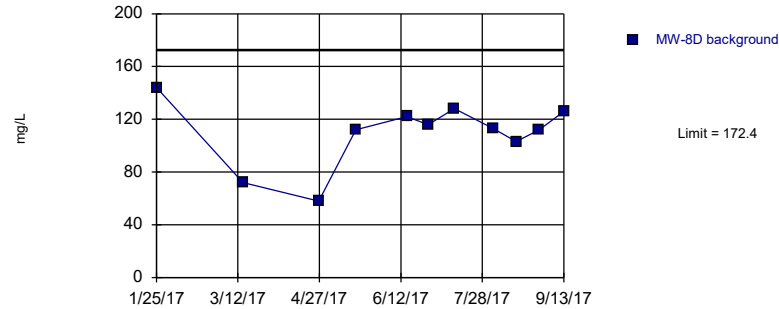
Prediction Limit  
Intrawell Parametric, MW-7D (bg)



Background Data Summary: Mean=881.6, Std. Dev.=419.4, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9691, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

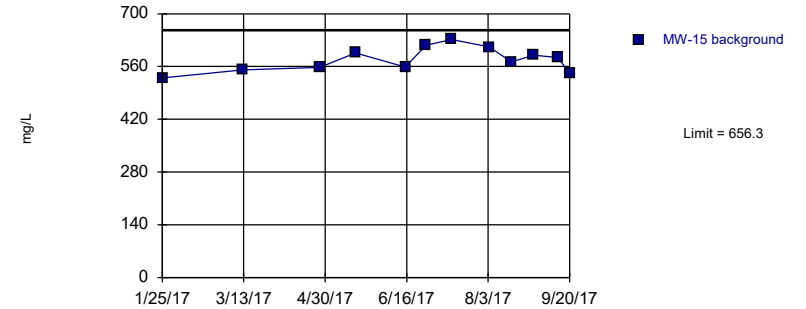
Prediction Limit  
Intrawell Parametric, MW-8D (bg)



Background Data Summary: Mean=109.6, Std. Dev.=24.76, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8848, critical = 0.792. Kappa = 2.535 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

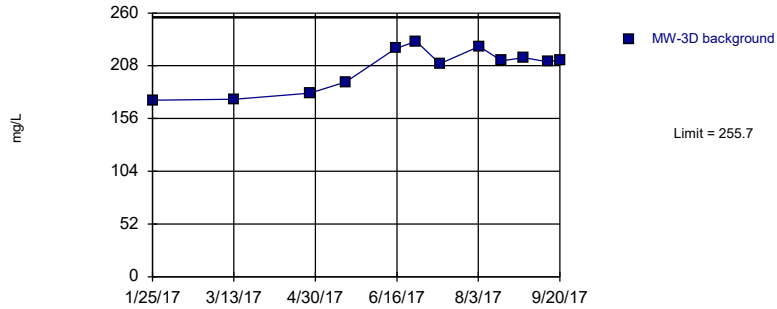
Prediction Limit  
Intrawell Parametric, MW-15



Background Data Summary: Mean=578.6, Std. Dev.=31.72, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.971, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

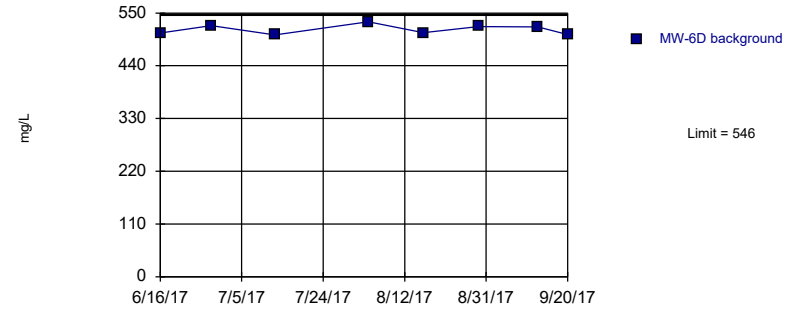
Prediction Limit  
Intrawell Parametric, MW-3D



Background Data Summary: Mean=205.9, Std. Dev.=20.34, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8886, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

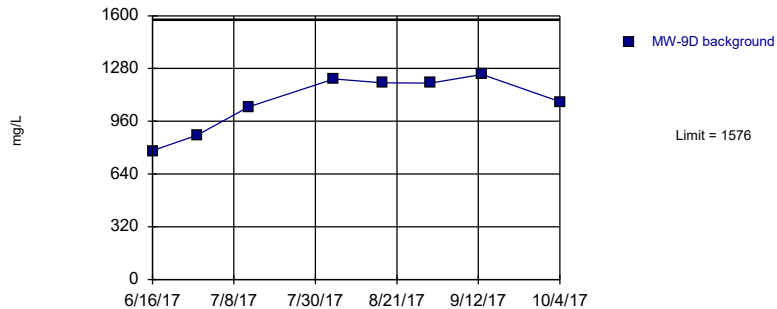
Prediction Limit  
Intrawell Parametric, MW-6D



Background Data Summary: Mean=515.6, Std. Dev.=10.41, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8968, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

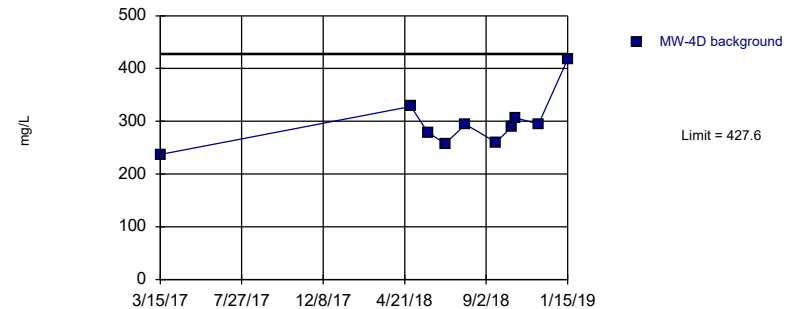
Prediction Limit  
Intrawell Parametric, MW-9D



Background Data Summary: Mean=1079, Std. Dev.=170.3, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8677, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

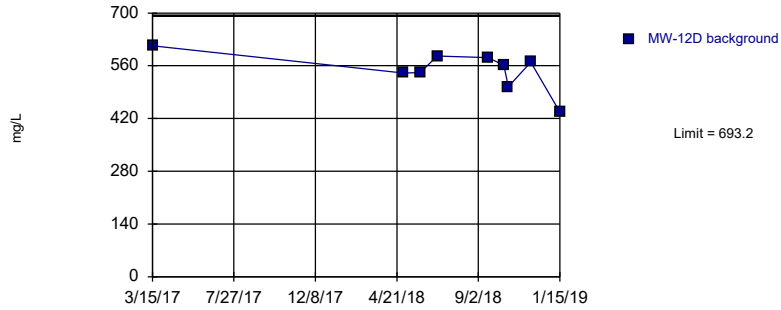
Prediction Limit  
Intrawell Parametric, MW-4D



Background Data Summary: Mean=296.4, Std. Dev.=50.08, n=10. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.855, critical = 0.781. Kappa = 2.621 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

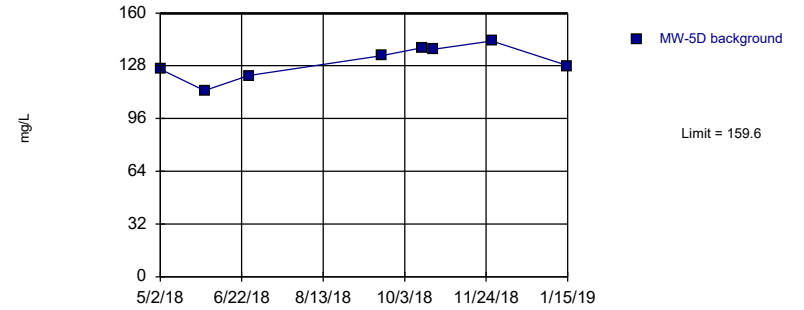
Prediction Limit  
Intrawell Parametric, MW-12D



Background Data Summary: Mean=548.4, Std. Dev.=52.22, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.911, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:42 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

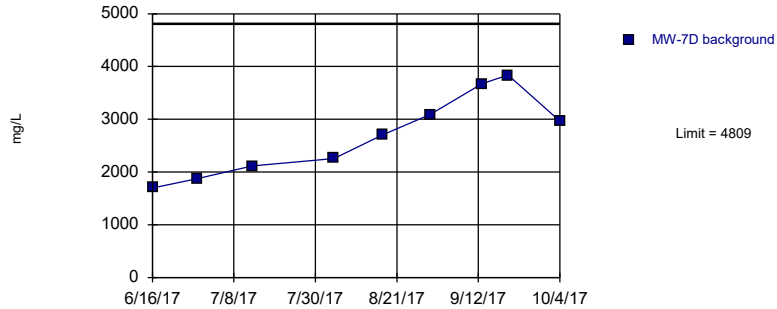
Prediction Limit  
Intrawell Parametric, MW-5D



Background Data Summary: Mean=130.4, Std. Dev.=10.01, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9604, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Sulfate Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

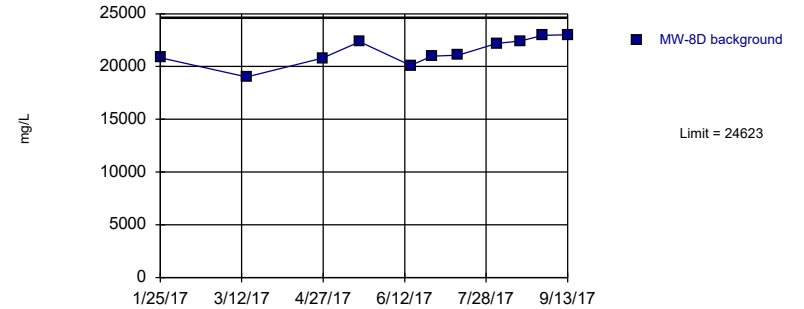
Prediction Limit  
Intrawell Parametric, MW-7D (bg)



Background Data Summary: Mean=2690, Std. Dev.=764.7, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9436, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

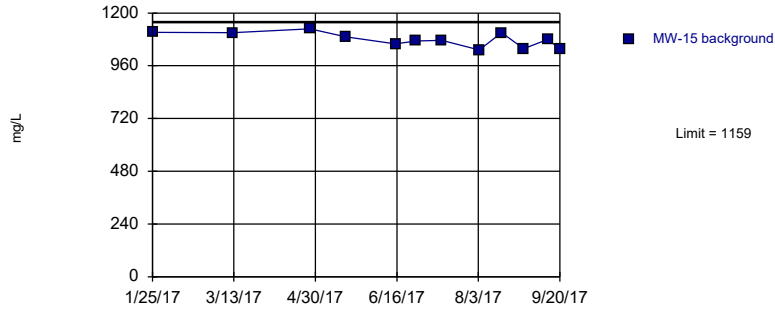
Prediction Limit  
Intrawell Parametric, MW-8D (bg)



Background Data Summary: Mean=21432, Std. Dev.=1259, n=11. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9319, critical = 0.792. Kappa = 2.535 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

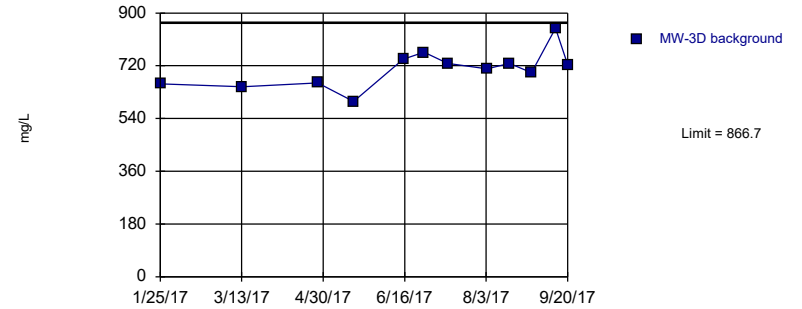
Prediction Limit  
Intrawell Parametric, MW-15



Background Data Summary: Mean=1079, Std. Dev.=32.67, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9324, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

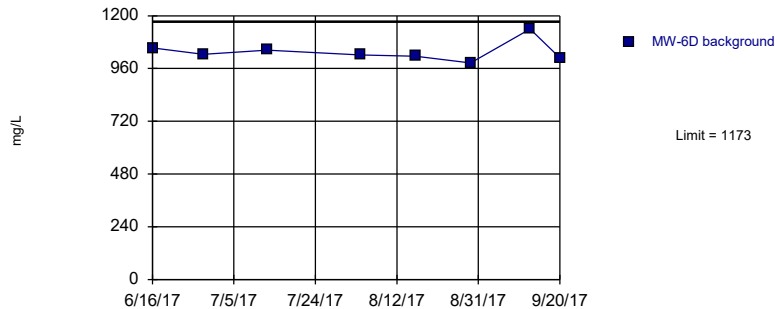
Prediction Limit  
Intrawell Parametric, MW-3D



Background Data Summary: Mean=709, Std. Dev.=64.4, n=12. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9634, critical = 0.805. Kappa = 2.449 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

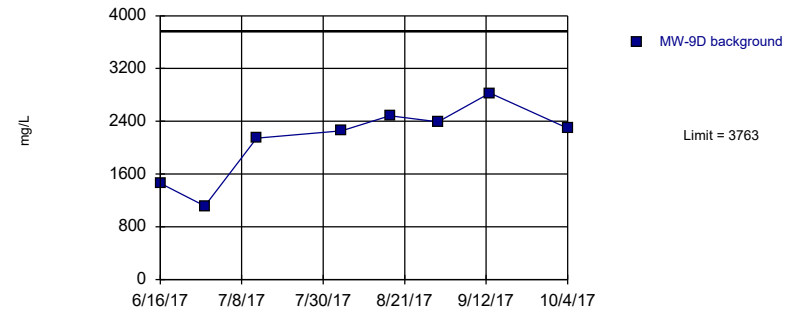
Prediction Limit  
Intrawell Parametric, MW-6D



Background Data Summary: Mean=1037, Std. Dev.=46.63, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.835, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

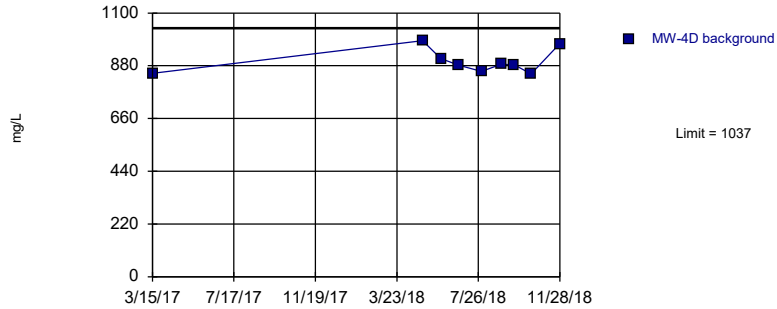
Prediction Limit  
Intrawell Parametric, MW-9D



Background Data Summary: Mean=2122, Std. Dev.=561.5, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8964, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

Prediction Limit  
Intrawell Parametric, MW-4D



Background Data Summary: Mean=896.4, Std. Dev.=50.69, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8544, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

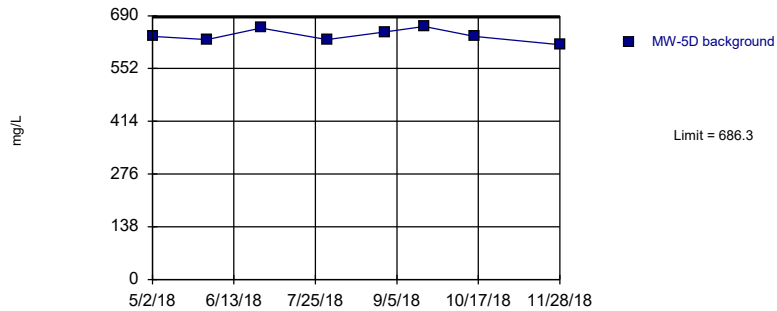
Prediction Limit  
Intrawell Parametric, MW-12D



Background Data Summary: Mean=1067, Std. Dev.=32.79, n=9. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8768, critical = 0.764. Kappa = 2.772 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

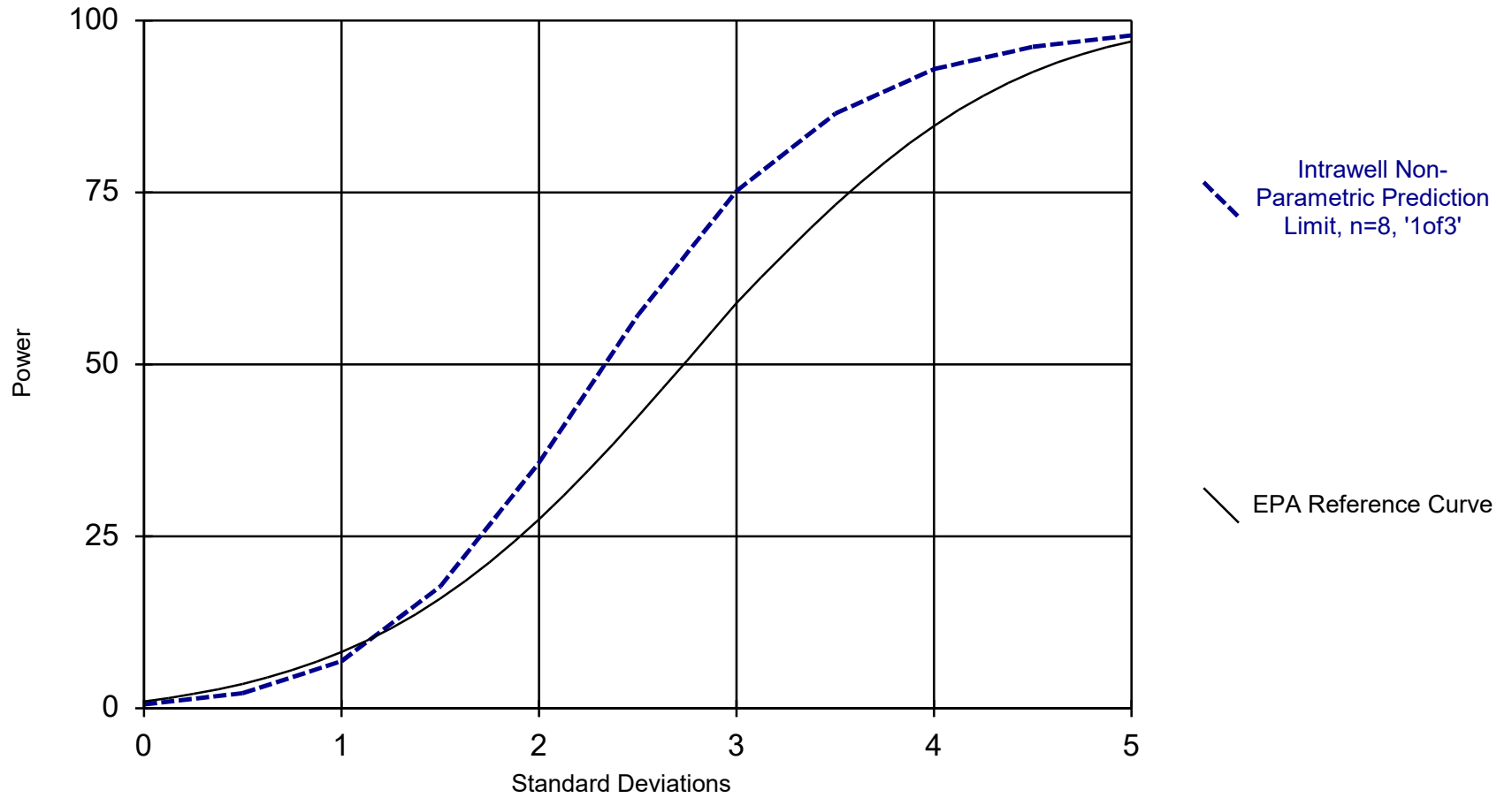
Prediction Limit  
Intrawell Parametric, MW-5D



Background Data Summary: Mean=638.8, Std. Dev.=16.28, n=8. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9519, critical = 0.749. Kappa = 2.923 (c=7, w=7, 1 of 2, event alpha = 0.05132). Report alpha = 0.001075. Assumes 1 future value.

Constituent: Total Dissolved Solids [TDS] Analysis Run 7/18/2019 3:43 PM View: PL's - Intrawell  
Northeastern LF Client: Geosyntec Data: Northeastern LF

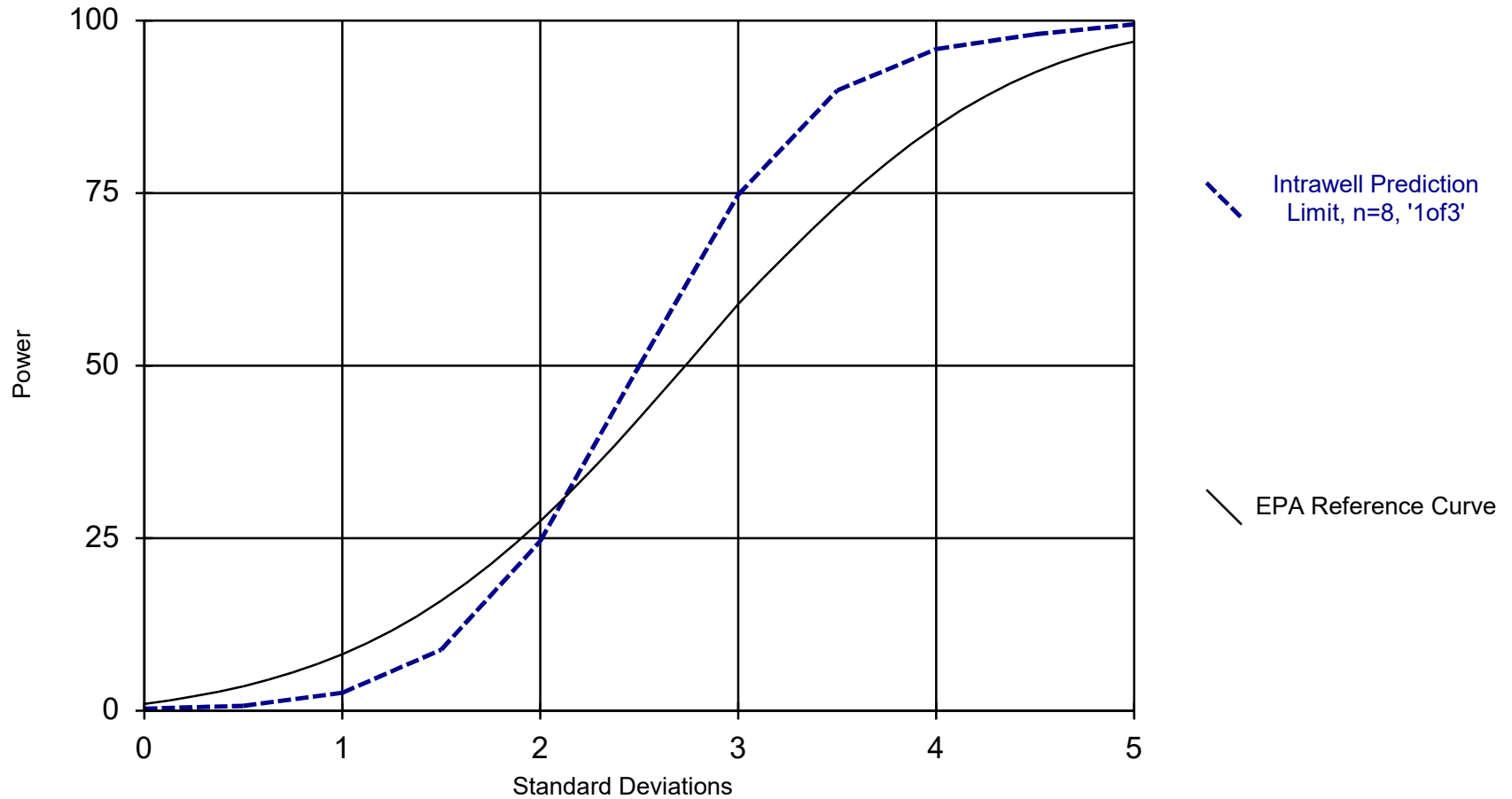
### Power Curve



Analysis Run 3/20/2019 8:46 PM

Northeastern LF Client: Geosyntec Data: Northeastern LF

## Power Curve



Kappa = 2.049, based on 7 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 3/20/2019 8:46 PM

Northeastern LF Client: Geosyntec Data: Northeastern LF



## Memorandum

Date: January 8, 2020

To: David Miller (AEP)

Copies to: Jill Parker-Witt (AEP)

From: Allison Kreinberg and Bruce Sass, Ph.D. (Geosyntec)

Subject: Evaluation of Detection Monitoring Data at  
Northeastern Plant's Landfill (LF)

---

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) detection monitoring events were completed on August 26, 2019 and December 3, 2019 at the Landfill (LF), an existing CCR unit at the Northeastern Power Plant located in Oologah, Oklahoma.

Background values for the LF were previously calculated for wells MW-3D, MW-6D, MW-9D, MW-12D, and MW-15 in January 2018. 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 these revised background values are described in Geosyntec's *Statistical Analysis Summary* report, dated January 8, 2020. After a revision to the well network, background values for MW-4D, and MW-5D, and MW-12D were calculated in July 2019.

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 Evaluation  
Northeastern Plant - Landfill**

Parameter	Units	Description	MW-3D		MW-4D	MW-5D		MW-6D		MW-9D		MW-12D	MW-15	
			8/26/2019	12/3/2019	8/26/2019	8/26/2019	12/3/2019	8/26/2019	12/3/2019	8/26/2019	12/3/2019	8/26/2019	8/26/2019	12/3/2019
Boron	mg/L	Intrawell Background Value (UPL)	1.07		1.52	0.647		4.73		8.00		10.3	10.6	
		Detection Monitoring Data	0.979	-	0.987	0.568	-	2.88	-	6.95	-	8.9	8.28	-
Calcium	mg/L	Intrawell Background Value (UPL)	181		221	172		342		456		198	196	
		Detection Monitoring Data	130	-	184	146	-	181	-	136	-	96.3	119	-
Chloride	mg/L	Intrawell Background Value (UPL)	16.0		46.2	35.3		34.1		403		25.6	104	
		Detection Monitoring Data	12.0	-	23.0	24.0	-	13.0	-	24.0	-	14.0	20.0	-
Fluoride	mg/L	Intrawell Background Value (UPL)	1.09		1.00	1.24		1.24		2.18		3.40	2.49	
		Detection Monitoring Data	0.608	-	0.171	0.412	-	0.634	-	0.758	-	1.60	1.25	-
pH	SU	Intrawell Background Value (UPL)	8.2		8.6	8.8		8.1		7.7		10.2	9.0	
		Intrawell Background Value (LPL)	6.3		6.7	6.9		6.3		6.8		6.7	6.7	
		Detection Monitoring Data	<b>8.5</b>	7.4	8.1	<b>9.8</b>	7.2	<b>8.6</b>	7.5	<b>8.8</b>	7.6	8.7	10.5	7.7
Sulfate	mg/L	Intrawell Background Value (UPL)	248		428	160		585		1640		720	642	
		Detection Monitoring Data	181	-	274	134	-	401	-	526	-	540	587	-
TDS	mg/L	Intrawell Background Value (UPL)	832		1040	686		1180		3480		1160	1160	
		Detection Monitoring Data	686	-	830	670	-	1040	-	1080	-	1020	1070	-

Notes

UPL: Upper prediction limit

LPL: Lower prediction limit

TDS: Total dissolved solids

**Bold values exceed the background value.**

Background values are shaded gray.

# ATTACHMENT A

Certification by Qualified Professional Engineer

**CERTIFICATION BY QUALIFIED PROFESSIONAL ENGINEER**

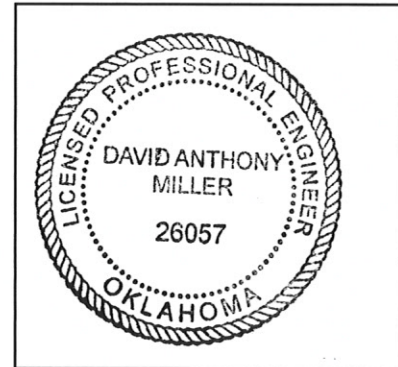
I certify that the selected statistical method, described above and in the January 8, 2020 *Statistical Analysis Summary* report, is appropriate for evaluating the groundwater monitoring data for the Northeastern LF CCR management area and that the requirements of OAC 252:517-9-4(g) have been met.

DAVID ANTHONY MILLER

Printed Name of Licensed Professional Engineer

David Anthony Miller

Signature



26057

License Number

OKLAHOMA

Licensing State

01.23.2020

Date

## **APPENDIX III**

Alternate source demonstrations are included in this appendix. Alternate sources are sources or reasons that explain that statistically significant increases over background or statistically significant levels above the groundwater protection standard are not attributable to the CCR unit.

**ALTERNATIVE SOURCE  
DEMONSTRATION REPORT  
STATE CCR RULE**

**Northeastern Plant Landfill  
Oologah, Oklahoma**

*Submitted to*



1 Riverside Plaza  
Columbus, Ohio 43215-2372

*Submitted by*

**Geosyntec**   
consultants

engineers | scientists | innovators

941 Chatham Lane  
Suite 103  
Columbus, OH 43221

January 31, 2019

CHA8462

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    2.1 Proposed Alternative Source ..... 2-1  
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Figure 1     Fluoride Time Series Graph at MW-15



## LIST OF ACRONYMS AND ABBREVIATIONS

AEP	American Electric Power
ASD	Alternative Source Demonstration
CCR	Coal Combustion Residuals
EPRI	Electric Power Research Institute
LPL	Lower Prediction Limit
OAC	Oklahoma Administrative Code
ODEQ	Oklahoma Department of Environmental Quality
QA	Quality Assurance
QC	Quality Control
SSI	Statistically Significant Increase
UPL	Upper Prediction Limit
USEPA	United States Environmental Protection Agency

## SECTION 1

### INTRODUCTION AND SUMMARY

Eight to twelve background monitoring events were previously conducted at the Northeastern Landfill. Upper prediction limits (UPLs) were calculated for each Appendix A parameter to represent background values using the results of these eight to twelve events. In addition, a lower prediction limit (LPL) was also calculated for pH. A one-of-two retesting procedure was employed for all wells at the Northeastern Landfill. Using this procedure, a statistically significant increase (SSI) is concluded only if both samples in a series of two exceed the UPL and, for pH, are lower than the LPL. If the initial result did not exceed a prediction limit, a second sample was not collected. These prediction limits were recalculated using intrawell statistics to reflect natural variability between wells, as described in the Alternate Source Demonstration (ASD) report prepared on April 13, 2018 (Geosyntec, 2018).

The first semi-annual detection monitoring event was performed in May 2018 (initial sampling event) and October 2018 (verification sampling event), and the results were compared to the calculated prediction limits. An SSI was identified for fluoride at MW-15 using intrawell comparisons following the procedure indicated in the April 2018 ASD report. A summary of the detection monitoring analytical results and the calculated prediction limits to which they were compared is presented in Table 1.

#### 1.1 CCR Rule Requirements

Oklahoma Department of Environmental Quality (ODEQ) regulations regarding detection monitoring programs for coal combustion residuals (CCR) landfills and surface impoundments allow the following evaluation process when an SSI has been identified (OAC 252:517-9-5(e)(2)):

*The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report.*

The first semi-annual sampling event was conducted on May 30, 2018 at the Northeastern Landfill to evaluate for SSIs over background limits. As part of the one-of-two retesting scheme, well MW-15 was resampled for fluoride on October 15, 2018 and an SSI was identified. Pursuant to OAC 252:517-9-5(e)(2), Geosyntec Consultants, Inc. (Geosyntec) has prepared this Alternative Source Demonstration (ASD) report, which documents that the SSI should not be attributed to the Northeastern Landfill.

## **1.2 Demonstration of Alternative Sources**

An evaluation was completed to assess possible alternative sources to which the identified SSI could be attributed. Alternative sources were identified amongst five types, based on methodology provided by EPRI (2017):

- ASD Type I: Sampling Causes;
- ASD Type II: Laboratory Causes;
- ASD Type III: Statistical Evaluation Causes;
- ASD Type IV: Natural Variation; and
- ASD Type V: Alternative Sources.

A demonstration was conducted to show that the increases in constituent concentrations were based on a Type II cause at MW-15 and not by a release from the Northeastern Landfill.

## SECTION 2

### ALTERNATIVE SOURCE DEMONSTRATION

The State CCR Rule allows the owner or operator 90 days from the determination of an SSI to demonstrate that a source other than the CCR unit caused the SSI. Identified SSIs, evaluation methodology, and the proposed alternative source are described below.

#### **2.1 Proposed Alternative Source**

Initial review of site geochemistry, site historical data, and laboratory QA/QC did not identify ASDs due to a Type I issue (sampling causes). As described below, the SSI was attributed to variation in the laboratory results, which is a Type II issue.

Following the revision to intrawell statistical techniques, the calculated UPL for fluoride at MW-15 is 2.24 milligrams per liter (mg/L). Both the initial and verification sampling results for the first semi-annual detection monitoring event in 2018 were above the UPL, with reported concentrations of 2.33 mg/L and 2.27 mg/L, respectively. The samples were analyzed using USEPA Method 300.0, which prescribes  $\pm 10\%$  variation as the daily calibration verification standard acceptance criteria (USEPA, 1993). Because both reported concentrations are within 10% (4% and 1.3% respectively) of the calculated UPL, the variations observed, although above the UPL, are likely due to the acceptable variation in the analytical procedure.

The second semi-annual sampling event was conducted on October 22, 2018. The reported fluoride concentration for the sample from well MW-15 was 2.17 mg/L, which is below the calculated UPL. Based on the three results for MW-15 during the 2018 groundwater monitoring events, a positive trend is not demonstrated for fluoride. Additionally, no other Appendix A exceedances were observed for MW-15 during the first semi-annual event. Thus, the observed fluoride concentrations during the first semi-annual event are not considered indicative of a release from the Landfill and are instead likely due to acceptable variation in the laboratory procedure and reporting results.

#### **2.2 Sampling Requirements**

As the ASD described above supports the position that the identified SSI is not due to a release from the Northeastern Landfill, the unit will remain in the detection monitoring program. Groundwater at the unit will continue to be sampled for Appendix A parameters on a semi-annual basis.

### **SECTION 3**

#### **CONCLUSIONS AND RECOMMENDATIONS**

The preceding information serves as the ASD prepared in accordance with OAC 252:517-9-4(e)(2) and supports the position that the SSI in fluoride for MW-15 observed during the first semi-annual sampling event in 2018 was not due to a release from the Northeastern Landfill. The observed SSI was, instead, attributed to allowable variation in the laboratory calibration standard. Therefore, no further action is warranted, and the Northeastern Landfill will remain in the detection monitoring program. Certification of this ASD by a qualified professional engineer is provided in Attachment A.

## **SECTION 4**

### **REFERENCES**

AEP, 2017. Statistical Analysis Plan – Northeastern Power Station. Oologah, Oklahoma. January 2017.

EPRI, 2017. Guidelines for Development of Alternative Source Demonstrations at Coal Combustion Residual Site. 3002010920. October 2017.

Geosyntec Consultants, 2018. Alternative Source Demonstration Report – Federal CCR Rule. Northeastern Plant Landfill. April.

USEPA, 1993. Method 300.0 – Determination of Inorganic Anions by Ion Chromatography. Revision 2.1.

**Table 1: Detection Monitoring Data Evaluation  
Northeastern Plant - Landfill**

*Geosyntec Consultants, Inc.*

Parameter	Units	Description	MW-3D	MW-6D	MW-9D	MW-15	
			5/30/2018	5/30/2018	--	5/30/2018	10/15/2018
Boron	mg/L	Intrawell Background Value (UPL)	0.975	4.35	8.11	10.6	
	mg/L	Detection Monitoring Result	0.952	3.35	--	8.76	--
Calcium	mg/L	Intrawell Background Value (UPL)	190	285	463	132	
	mg/L	Detection Monitoring Result	129	269	--	105	--
Chloride	mg/L	Intrawell Background Value (UPL)	16.2	33.9	383	78	
	mg/L	Detection Monitoring Result	13	32	--	33	--
Fluoride	mg/L	Intrawell Background Value (UPL)	1	0.941	2.28	2.243	
	mg/L	Detection Monitoring Result	0.896	0.922	--	<b>2.33</b>	<b>2.27</b>
pH	SU	Intrawell Background Value (UPL)	8.03	8.32	7.77	9.14	
	SU	Intrawell Background Value (LPL)	6.17	5.98	6.74	6.56	
	SU	Detection Monitoring Result	7.46	7.39	--	7.713	--
Total Dissolved Solids	mg/L	Intrawell Background Value (UPL)	853	1159	3591	1152	
	mg/L	Detection Monitoring Result	724	1090	--	1128	--
Sulfate	mg/L	Intrawell Background Value (UPL)	251	543	1524	649	
	mg/L	Detection Monitoring Result	214	401	--	549	--

Notes:

UPL: Upper prediction limit

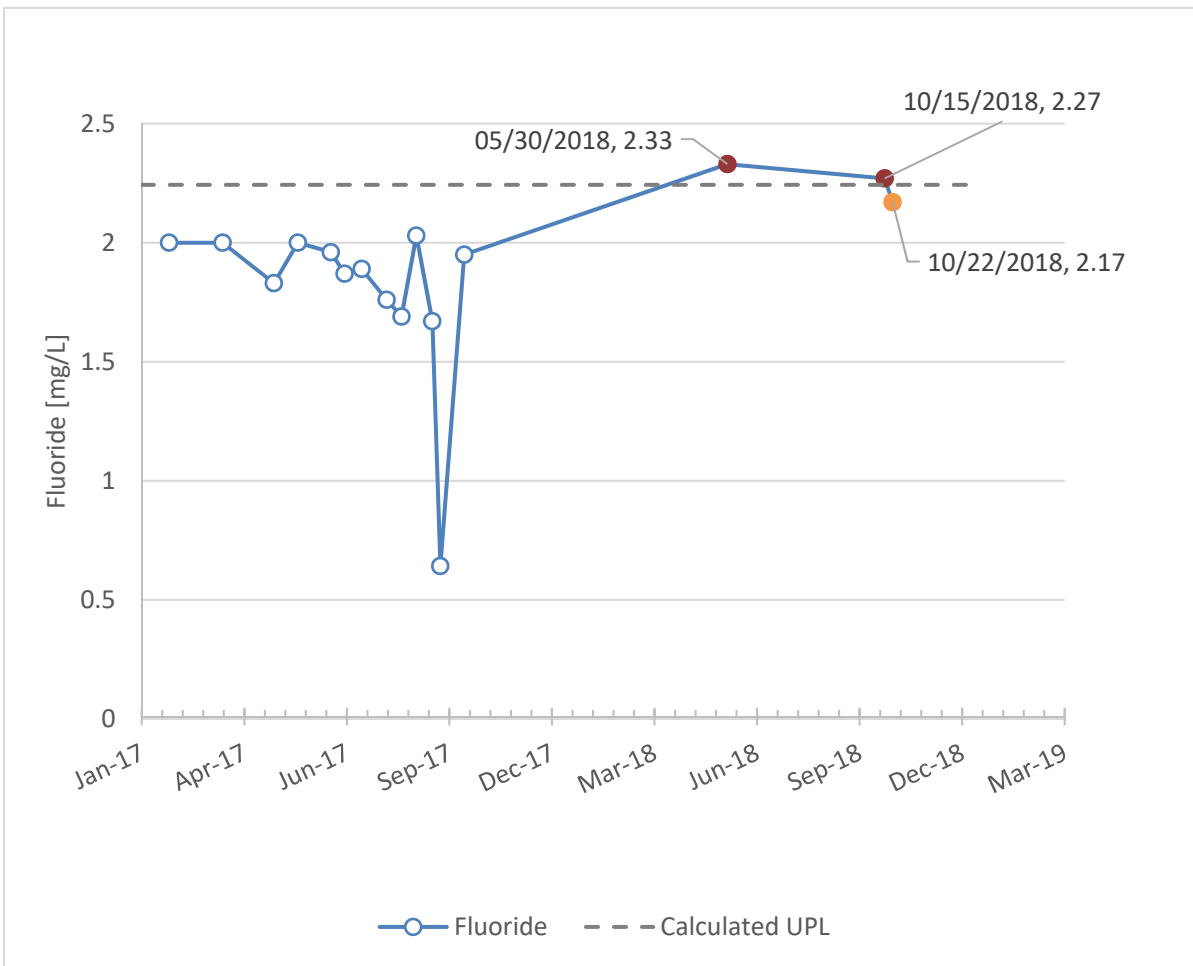
LPL: Lower prediction limit

--: Not Sampled

**Background values are shaded gray.**

**Bold values exceed the background value.**

MW-9D was purged dry during the May 2018 event and a sample could not be collected.



Notes: Initial sampling for the first semi-annual detection monitoring event occurred on 5/30/2018. Verification sampling for the first semi-annual event occurred on 10/15/2018. Initial sampling for the second semi-annual event occurred on 10/22/2018. The upper prediction limit (UPL) was calculated using intrawell analyses.

**Fluoride Time Series Graph at MW-15**  
Northeastern Landfill

Geosyntec  
consultants



Figure  
1

Columbus, Ohio

24-Jan-2019

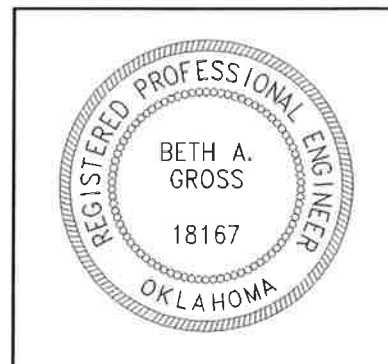


**CERTIFICATION BY A QUALIFIED PROFESSIONAL ENGINEER**

I certify that the selected and above described alternative source demonstration 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(e)(2) have been met.

Beth Ann Gross  
Printed Name of Licensed Professional Engineer

Beth Ann Gross  
Signature



Geosyntec Consultants  
8217 Shoal Creek Blvd., Suite 200  
Austin, TX 78757

Oklahoma Firm Certificate of  
Authorization No. 1996  
Exp. 6/30/2020

18167  
License Number

Oklahoma  
Licensing State

January 31, 2019  
Date



SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

March 18, 2019

RECEIVED MAR 18 2 2019

Ms. Jill Parker-Witt, P.E.  
American Electric Power  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Alternate Source Demonstration – Coal Combustion Residuals Landfill  
Public Service Company of Oklahoma-Northeastern Power Station Ash Landfill  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

The Department of Environmental Quality (DEQ) received the Alternate Source Demonstration (ASD) for the Coal Combustion Residuals (CCR) Landfill, by email, on January 31, 2019. A statistically significant increase (SSI) over background was indicated for fluoride at groundwater monitoring well MW-15. Oklahoma Administrative Code (OAC) 252:517-9-5(e)(2) allows NPS to demonstrate, within ninety (90) days of detecting an SSI, that a source other than the CCR landfill caused the SSI over background levels.

The first sampling event was May 30, 2018. MW-15 was resampled for fluoride on October 15, 2018. The second semi-annual sampling event was October 22, 2018. The concentrations of fluoride were 2.24 mg/L, 2.27 mg/L and 2.17 mg/L respectively. The sample and resample concentrations are within ten (10) percent of the intrawell upper prediction limit (UPL) of 2.24 mg/L (4% and 1.3% respectively) which is the acceptable variation for the analytical procedure used in the analyses. Additionally, the result for the second semi-annual detection monitoring event was below the UPL and an increasing trend was not indicated. **The SSI is attributed to a laboratory cause and the ASD is accepted as submitted.**

If you have any questions, please contact Ms. Cynthia Hailes, P.E. at (405) 702-5114.

Sincerely,

Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh

**APPENDIX IV**

Groundwater monitoring field and laboratory reports.

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenneth McDonald

DATE: 01/22/18

Well Identification Number	MW-1D	MW-2D	MW-3D	MW-4D	MW-5D	MW-6D
Sample Identification			SAMPLE			SAMPLE
Elevation of Top of Casing (ft. NGVD)	638.07	638.19	630.65	625.00	636.84	636.8
Depth to Water (ft)						33.97
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	61.80	62.95	53.95	58.42	58.51
Height of Water Column (ft.)						
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)						
Water Removed From Well (gallons)						
Method of Removal						
Was Well Purged Dry?						
pH (standard units)						6.85
Temperature (°C)						17.24
Conductivity (µmhos/cc)						1910
Turbidity (NTU)						108
Dissolved Oxygen (mg/L)						3.61
ORP (mV)						137
Purge Time - Begin						
Purge Time - End						
Sample Time						504/F/B
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: Kenneth McDonald . DATE: 01/22/18 .

Well Identification Number	MW-7D	MW-8D	MW-9D	MW-10D	MW-11D	MW-12D
Sample Identification	SAMPLE	SAMPLE	SAMPLE			
Elevation of Top of Casing (ft. NGVD)	626.45	629.32				
Depth to Water (ft)			59.72			
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	64.50	64.02	71.20	50.17	44.80
Height of Water Column (ft.)						
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)						
Water Removed From Well (gallons)						
Method of Removal						
Was Well Purged Dry?						
pH (standard units)			7.14			
Temperature (°C)			18.23			
Conductivity (µmhos/cc)			1720			
Turbidity (NTU)			306			
Dissolved Oxygen (mg/L)			1.84			
ORP (mV)			157			
Purge Time - Begin						
Purge Time - End						
Sample Time			B/RA			
Sample Date			2RA			

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenneth McDonald . DATE: 01/22/18 .

Well Identification Number	MW-13D	MW-14	MW-15	MW-16	MW-17	SP-1
Sample Identification			SAMPLE			SAMPLE
Elevation of Top of Casing (ft. NGVD)						621.26
Depth to Water (ft)			61.71			16.70
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.39	78.96	74.21	64.15	58.41	37.99
Height of Water Column (ft.)						
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)						
Water Removed From Well (gallons)						
Method of Removal						
Was Well Purged Dry?						
pH (standard units)			7.24			6.90
Temperature (°C)			17.91			18.09
Conductivity (µmhos/cc)			1850			849
Turbidity (NTU)			208			54.2
Dissolved Oxygen (mg/L)			5.31			3.14
ORP (mV)			136			131
Purge Time - Begin						
Purge Time - End						
Sample Time			B			Ca
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: 05/01-02/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	CCR III & IV	Gauge	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.04	22.41	55.13	32.22	37.07	21.31
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	4.21	15.35	6.67	4.53	25.88	5.90
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.68	2.50	1.08	0.74	4.22	0.96
Water Removed From Well (gallons)	0.50	—	3.25	1.0	13.0	1.25
Method of Removal	Bailer	—	Pump	Pump	Pump	Pump
Was Well Purged Dry?	Yes	—	No	Yes	No	Yes
pH (standard units)		—	10.60	9.16	7.27	7.36
Temperature (°C)		—	20.32	19.98	20.30	20.25
Conductivity (µmhos/cc)		—	1770	2250	1020	2260
Turbidity (NTU)		—	183	285	78.3	108
Appearance		—	SLIGHTLY TURBID	TURBID	CLEAR	SLIGHTLY TURBID
Odor		—	NONE	NONE	NONE	SLIGHT SULPHUR
Purge Time - Begin	DW 57.04 05/01 @ 1455	—				
Purge Time - End	PW 56.18 05/02 @ 1300	—				
Sample Time	0.33 GAL INSUFFICIENT	—	1035	1045	940	0955
Sample Date	WATER	—	05/02/18	05/02/18	05/02/18	05/02/18

For 2" well multiply by	0.163
For 4" well multiply by	0.653

PWP Dup-111

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald DATE: 05/01-02/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR III & IV	Gauge	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.15	dry	22.20	20.91	33.95	dry
Water Level Elevation (ft. NGVD)		—				—
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.71	—	36.22	12.24	24.56	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.75	—	5.90	2.00	4.00	—
Water Removed From Well (gallons)	6.0	—	11.25	6.0	10.50	—
Method of Removal	Pump	—	Pump	Pump	Pump	—
Was Well Purged Dry?	No	—	Yes	No	Yes	—
pH (standard units)	7.14	—	7.32	7.03	7.28	—
Temperature (°C)	20.66	—	19.22	19.27	20.40	—
Conductivity (µmhos/cc)	1240	—	931	1240	1370	—
Turbidity (NTU)	136	—	94.6	117	206	—
Appearance	SLIGHTLY TURBID	—	CLEAR	CLEAR	SLIGHTLY TURBID	—
Odor	NONE	—	NONE	SLIGHT SULPHUR	NONE	—
Purge Time - Begin		—				—
Purge Time - End		—				—
Sample Time	920	—	1105	1055	1010	—
Sample Date	05/02/18	—	05/02/18	05/02/18	05/02/18	—

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: 05/01-02/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	Gauge	Gauge	Gauge	Gauge	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	13.93	11.46	27.36	7.51	57.03	26.47
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	<del>64.02</del> 63.10	36.71
Height of Water Column (ft.)	44.77	22.08	42.14	35.79	6.07	10.24
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	7.30	3.60	6.87	5.83	0.99	1.67
Water Removed From Well (gallons)	—	—	—	—	0.75	2.0
Method of Removal	—	—	—	—	Pump	Pump
Was Well Purged Dry?	—	—	—	—	Yes	Yes
pH (standard units)	—	—	—	—		11.83
Temperature (°C)	—	—	—	—		20.45
Conductivity (µmhos/cc)	—	—	—	—		3690
Turbidity (NTU)	—	—	—	—		289
Appearance	—	—	—	—		TINTED BROWN
Odor	—	—	—	—		None
Purge Time - Begin	—	—	—	—	DTW 62.30 05/01 @ 1530	
Purge Time - End	—	—	—	—	DTW 61.94 05/02 @ 1305	
Sample Time	—	—	—	—	0.19 GAL INSUFFICIENT	1025
Sample Date	—	—	—	—	WATER	05/02/18

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: 05/01-02/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.77	628.75	623.67	623.50
Depth to Water (ft)	68.32	22.77	47.68	12.51	15.62	11.78
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	<del>71.33</del> <del>71.26</del>	36.22	<del>50.34</del> <del>50.17</del>	31.02	<del>44.92</del> <del>44.80</del>	<del>22.94</del> <del>22.76</del>
Height of Water Column (ft.)	3.01	13.45	2.66	18.51	29.30	11.16
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.49	2.19	0.43	3.02	4.78	1.82
Water Removed From Well (gallons)	0.25	7.0	0.25	10.0	11.0	6.0
Method of Removal	Bailer	Pump	Bailer	Pump	Pump	Pump
Was Well Purged Dry?	Yes	No	Yes	No	Yes	No
pH (standard units)		8.17		7.87	7.39	7.17
Temperature (°C)		19.68		19.06	18.00	18.20
Conductivity (µmhos/cc)		904		799	1330	948
Turbidity (NTU)		53.2		41.6	422	108
Appearance		Clean		Clean	Turbid	Clean
Odor		None		None	None	None
Purge Time - Begin	DTW 70.01 05/01 @ 1600		DTW 48.67 05/01 @ 1610			
Purge Time - End	DTW 69.89 05/02 @ 1210		DTW 48.62 05/02 @ 1200			
Sample Time	0.23 GAL INSUFFICIENT	1205	0.28 GAL INSUFFICIENT	1155	1140	1145
Sample Date	WATN	05/02/18	WATN	05/02/18	05/02/18	05/02/18

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: 05/01-02/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Gauge	CCR III & IV	CCR III & IV
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	34.78	15.66	72.21	55.85	61.29	52.11
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	<del>47.56</del> 47.39	<del>18.12</del> 18.05	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	12.78	<del>2.46</del> <del>18.12</del>	6.75	18.36	2.86	6.30
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	2.08	0.40	1.10	2.99	0.47	1.03
Water Removed From Well (gallons)	6.50	0.25	0.75	—	0.25	0.50
Method of Removal	Pump	BAIWA	Pump	—	Pump	Pump
Was Well Purged Dry?	No	YFS	YFS	—	YFS	YFS
pH (standard units)	7.08	7.19		—		
Temperature (°C)	19.06	17.25		—		
Conductivity (µmhos/cc)	13,80	908		—		
Turbidity (NTU)	101	124		—		
Appearance	Clear	Clear		—		
Odor	None	None		—		
Purge Time - Begin			DTW 77.31 05/01 @ 1440	—	DTW 63.01 05/01 @ 1540	DTW 56.67 05/01 @ 1550
Purge Time - End			DTW 76.82 05/02 @ 1310	—	DTW 62.21 05/02 @ 1315	DTW 56.03 05/01 @ 1320
Sample Time	1130	1125	0.35 GAL INSUFFICIENT	—	0.32 GAL INSUFFICIENT	0.39 GAL INSUFFICIENT
Sample Date	05/02/18	05/02/18	WATM2	—	WATM	WATM

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: 05/29-30/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	CCR III & IV	NA	CCR III & IV	Metals IV	CCR III & IV (No Radium)	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	53.76		58.41	34.23	37.11	21.89
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	4.49		3.39	2.52	25.84	5.32
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.73		0.55	0.41	4.21	0.97
Water Removed From Well (gallons)	0.50		1.25	0.50	13.0	1.0
Method of Removal	BALLOON		PUMP	PUMP	PUMP	PUMP
Was Well Purged Dry?	YES		YES	YES	NO	YES
pH (standard units)	7.38		10.43	7.81	7.46	6.97
Temperature (°C)	22.92		21.86	20.94	22.34	22.88
Conductivity (µmhos/cc)	4060		1840	1320	1120	2260
Turbidity (NTU)	21.8		122	127	64.8	21.4
Appearance	CLEAR		SLIGHTLY TURBID	TURBID	CLEAR	CLEAR
Odor	NONE		NONE	NONE	NONE	NONE
Purge Time - Begin						
Purge Time - End						
Sample Time	1312		1342	1039	1422	1111
Sample Date	05/30/18		05/30/18	05/30/18	05/30/18	05/30/18

METALS ONLY	METALS ONLY
For 2" well multiply by	0.163
For 4" well multiply by	0.653

Duplicate  
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# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald DATE: 05/29-30/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR III & IV	NA	CCR III & IV	Metals IV	CCR III & IV (No Radium)	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.54		29.73	22.61	33.66	dry
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.32		28.69	10.54	24.85	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.68		4.68	1.72	4.05	—
Water Removed From Well (gallons)	5.5		9.75	6.0	9.75	—
Method of Removal	Pump		Pump	Pump	Pump	—
Was Well Purged Dry?	No		Yes	No	Yes	—
pH (standard units)	7.00		7.23	6.78	7.39	—
Temperature (°C)	22.71		22.16	20.90	22.41	—
Conductivity (µmhos/cc)	1150		1520	1430	1290	—
Turbidity (NTU)	60.2		125	72.3	128	—
Appearance	CLEAR		SLIGHTLY TURBID	CLEAR BROWN TINT	TURBID	—
Odor	NONE		NONE	SLIGHT SULPHUR	NONE	—
Purge Time - Begin						—
Purge Time - End						—
Sample Time	1437		1326	1022	1409	—
Sample Date	05/30/18		05/30/18	05/30/18	05/30/18	—

LANDFILL DUP

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: 05/29-30/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	CCR III & IV (No Radium)	NA	CCR III & IV (No Radium)	NA	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	13.12		21.71		56.66	26.75
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	45.58		42.79		6.44	9.96
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	7.43		6.97		1.05	1.62
Water Removed From Well (gallons)	18.25		16.0		0.75	1.75
Method of Removal	pump		pump		pump	pump
Was Well Purged Dry?	YES		YES		YES	YES
pH (standard units)	7.05		6.95		—	11.25
Temperature (°C)	22.25		21.72		—	22.91
Conductivity (µmhos/cc)	6230		29700		—	3280
Turbidity (NTU)	21.8		17.0		—	88.3
Appearance	CLEAR		CLEAR		—	Brown TINT
Odor	None		None		—	None
Purge Time - Begin						
Purge Time - End						
Sample Time	1451		1512		INSUFFICIENT WATER	1053
Sample Date	05/30/18		05/30/18			05/30/18

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: 05/29-30/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	68.15	24.29	47.57	14.37	18.75	13.38
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	3.18	11.93	2.77	16.65	26.17	9.56
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.52	1.94	0.45	2.71	4.27	1.56
Water Removed From Well (gallons)	0.25	6.0	0.25	9.5	9.75	5.0
Method of Removal	BAILER	PUMP	BAILER	PUMP	PUMP	PUMP
Was Well Purged Dry?	YES	NO	YES	NO	YES	NO
pH (standard units)	7.46	7.26	7.34	7.32	7.68	6.77
Temperature (°C)	19.69	19.02	19.46	18.61	18.20	18.17
Conductivity (µmhos/cc)	9560	1390	1450	832	1330	899
Turbidity (NTU)	44.6	128	62.5	36.2	158	81.4
Appearance	CLEAR	SLIGHTLY TURBID	CLEAR	CLEAR	SLIGHTLY TURBID	CLEAR
Odor	NONE	NONE	NONE	NONE	NONE	NONE
Purge Time - Begin						
Purge Time - End						
Sample Time	1137	1131	1200	1158	1223	1217
Sample Date	05/30/18	05/30/18	05/30/18	05/30/18	05/30/18	05/30/18

METALS ONLY	METALS ONLY
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: 05/29-30/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	CCR III & IV (No Radium)	CCR III & IV	CCR III & IV
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	40.69	16.60	71.65	60.04	61.18	51.54
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	6.87	1.52	7.31	14.17	2.97	6.87
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.12	0.25	1.19	2.31	0.48	1.12
Water Removed From Well (gallons)	4.0	0.1	0.75	4.5	0.25	1.5
Method of Removal	pump	BALLOON	pump	pump	pump	pump
Was Well Purged Dry?	No	Yes	Yes	Yes	Yes	Yes
pH (standard units)	6.89	—	6.72	7.71	—	7.98
Temperature (°C)	20.61	—	25.27	23.64	—	22.64
Conductivity (µmhos/cc)	1370	—	9080	1620	—	1560
Turbidity (NTU)	283	—	59.1	152	—	22.3
Appearance	TURBID	—	Clear	TURBID	—	Clear
Odor	None	—	None	None	—	None
Purge Time - Begin						
Purge Time - End						
Sample Time	1242	INSUFFICIENT	1258	1357	INSUFFICIENT WATER	
Sample Date	05/30/18	Water	05/30/18	05/30/18		

	METALS ONLY
For 2" well multiply by	0.163
For 4" well multiply by	0.653

METALS ONLY



# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald

DATE: 06/26-27/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	CCR III & IV	Gauge	CCR III & IV	Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.96	24.62	59.67	35.23	—	24.49
Water Level Elevation (ft. NGVD)					—	
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.29	13.14	2.13	1.52	—	2.72
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.54	2.14	0.35	0.25	—	0.44
Water Removed From Well (gallons)	0.25	—	0.25	0.1	—	0.25
Method of Removal	BAILER	—	BAILER	BAILER	—	BAILER
Was Well Purged Dry?	YES	—	YES	YES	—	YES
pH (standard units)	—	—	—	—	—	—
Temperature (°C)	—	—	—	—	—	—
Conductivity (µmhos/cc)	—	—	—	—	—	—
Turbidity (NTU)	—	—	—	—	—	—
Appearance	—	—	—	—	—	—
Odor	—	—	—	—	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
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 M Donati

DATE: 06/26-27/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.81	Dry	30.87	23.48	—	Dry
Water Level Elevation (ft. NGVD)		—			—	—
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.05	—	27.55	9.67	—	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.64	—	4.49	1.58	—	—
Water Removed From Well (gallons)	6.0	—	8.25	5.0	—	—
Method of Removal	Pump	—	Pump	Pump	—	—
Was Well Purged Dry?	No	—	Yes	No	—	—
pH (standard units)	7.94	—	8.23	7.89	—	—
Temperature (°C)	20.13	—	20.04	22.41	—	—
Conductivity (µmhos/cc)	1220	—	938	1400	—	—
Turbidity (NTU)	113	—	76.4	51.2	—	—
Appearance	Clear	—	Slightly Turbid	Slightly Turbid	—	—
Odor	None	—	None	None	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	1105	—	0930	0915	—	—
Sample Date	06/27/18	—	06/27/18	06/27/18	—	—

*DUPLICATE*

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: KERRY McDONALD

DATE: 06/26-27/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	NA	GAUGE	NA	GAUGE	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	—	12.85	—	9.66	—	27.18
Water Level Elevation (ft. NGVD)	—		—		—	
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	—	20.69	—	33.64	—	9.53
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	—	3.37	—	5.48	—	1.55
Water Removed From Well (gallons)	—	—	—	—	—	1.5
Method of Removal	—	—	—	—	—	Pump
Was Well Purged Dry?	—	—	—	—	—	YES
pH (standard units)	—	—	—	—	—	11.79
Temperature (°C)	—	—	—	—	—	22.48
Conductivity (µmhos/cc)	—	—	—	—	—	3380
Turbidity (NTU)	—	—	—	—	—	55.5
Appearance	—	—	—	—	—	Brown tint
Odor	—	—	—	—	—	none
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	—	—	—	—	—	1000
Sample Date	—	—	—	—	—	06/27/18

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: 06/26-27/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	68.96	25.29	48.29	15.26	19.79	19.40
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.37	10.93	2.05	15.76	25.13	3.54
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.39	1.78	0.33	2.57	4.10	0.58
Water Removed From Well (gallons)	0.25	6.5	0.25	8.0	8.0	1.25
Method of Removal	BAILER	PUMP	BAILER	PUMP	PUMP	PUMP
Was Well Purged Dry?	YES	NO	YES	NO	YES	YES
pH (standard units)	7.72	8.29	—	8.23	8.23	7.49
Temperature (°C)	20.84	20.64	—	19.60	18.33	19.03
Conductivity (µmhos/cc)	8760	826	—	860	1390	972
Turbidity (NTU)	52.1	46.2	—	43.3	124	27.2
Appearance	CLEAR	CLEAR	—	CLEAR	CLEAR	CLEAR
Odor	NONE	NONE	—	NONE	NONE	SUB HT SULPHUR
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	1210	1150	—	1240	1315	1255
Sample Date	06/27/18	06/27/18	—	06/27/18	06/27/18	06/27/18

METALS ONLY	
For 2" well multiply by	0.163
For 4" well multiply by	0.653

PUP  
SHALLOW

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenneth McDonald

DATE: 06/26-27/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	NA	CCR III & IV	CCR III & IV
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	44.88	17.05	73.06	—	61.61	53.07
Water Level Elevation (ft. NGVD)				—		
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	2.68	1.07	5.90	—	2.54	5.34
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.44	0.17	0.96	—	0.41	0.87
Water Removed From Well (gallons)	0.75	0.1	0.75	—	0.25	1.0
Method of Removal	Pump	BAILER	Pump	—	Pump	Pump
Was Well Purged Dry?	YES	YES	YES	—	YES	YES
pH (standard units)	7.29	—	7.27	—	—	8.54
Temperature (°C)	19.82	—	23.27	—	—	23.21
Conductivity (µmhos/cc)	1400	—	9050	—	—	1640
Turbidity (NTU)	170	—	50.1	—	—	15.4
Appearance	SLIGHTLY TURBID	—	CLEAR	—	—	CLEAR
Odor	None	—	None	—	—	None
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	1335	—	1410	—	—	1020
Sample Date	06/27/18	—	06/27/18	—	—	06/27/18

METALS ONLY	METALS ONLY
For 2" well multiply by	0.163
For 4" well multiply by	0.653

METALS ONLY

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald

DATE: 07/30/31/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification		(Gauge)		Metals IVs	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.77	24.86	60.31	35.18	—	25.85
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.48	12.90	1.49	1.57	—	1.36
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.57	2.10	0.24	0.26	—	0.22
Water Removed From Well (gallons)	0.25	—	0.10	0.10	—	
Method of Removal	BAUER	—	BAUER	BAUER	—	
Was Well Purged Dry?	YES	—	YES	YES	—	
pH (standard units)	—	—	—	—	—	—
Temperature (°C)	—	—	—	—	—	—
Conductivity (µmhos/cc)	—	—	—	—	—	—
Turbidity (NTU)	—	—	—	—	—	—
Appearance	—	—	—	—	—	—
Odor	—	—	—	—	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	—	NO	NO	—	NO
Sample Date	SAMPLE	—	SAMPLE	SAMPLE	—	SAMPLE

For 2" well multiply by	0.163
For 4" well multiply by	0.653

NO  
LID

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald

DATE: 07/30/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR Heavy	Metals IV	CCR Light	Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.42	Dry	29.38	23.92	—	Dry
Water Level Elevation (ft. NGVD)						
Measured Depth - Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.44	—	29.04	9.23	—	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.70	—	4.73	1.50	—	—
Water Removed From Well (gallons)	8.0	—	8.75	6.0	—	—
Method of Removal	Pump	—	Pump	Pump	—	—
Was Well Purged Dry?	NO	—	YES	NO	—	—
pH (standard units)	7.82	—	8.28	7.81	—	—
Temperature (°C)	18.96	—	19.06	20.01	—	—
Conductivity (µmhos/cc)	1140	—	920	1490	—	—
Turbidity (NTU)	30.4	—	67.1	18.4	—	—
Appearance	Clear	—	Slightly Turbid	Slightly Turbid	—	—
Odor	None	—	None	None	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	0910	NO	0830	0942	—	NO
Sample Date	07/31/18	SAMPLE	07/31/18	07/30/18	—	SAMPLE

LANDFILL

For 2" well multiply by	0.163
For 4" well multiply by	0.653

DUP

DUP  
SHALLOW

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenna McDeane

DATE: 07/30-31/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	NA	Gauge	NA	Gauge	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	—	12.80	—	10.51	—	27.68
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	—	20.74	—	32.79	—	9.03
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	—	3.38	—	5.34	—	1.47
Water Removed From Well (gallons)	—	—	—	—	—	1.50
Method of Removal	—	—	—	—	—	pump
Was Well Purged Dry?	—	—	—	—	—	YES
pH (standard units)	—	—	—	—	—	11.52
Temperature (°C)	—	—	—	—	—	21.05
Conductivity (µmhos/cc)	—	—	—	—	—	3500
Turbidity (NTU)	—	—	—	—	—	57.8
Appearance	—	—	—	—	—	BROWN TINT
Odor	—	—	—	—	—	NONE
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	—	—	—	—	—	1016
Sample Date	—	—	—	—	—	07/30/18

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: 07/30-31/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification		Metals IV		Metals IV		Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	69.30	25.84	48.27	15.61	20.09	20.79
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.03	10.38	2.07	15.41	24.83	2.15
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.33	1.69	0.34	2.51	4.05	0.35
Water Removed From Well (gallons)	6.1	6.0	0.25	9.0	7.75	<del>7.0</del>
Method of Removal	Bailer	Pump	Bailer	Pump	Pump	Pump
Was Well Purged Dry?	YES	NO	YES	NO	YES	YES
pH (standard units)	—	8.43	—	8.75	8.65	7.24
Temperature (°C)	—	21.70	—	20.73	19.37	19.68
Conductivity (µmhos/cc)	—	751	—	788	1280	1006
Turbidity (NTU)	—	55.8	—	23.1	97.4	42.7
Appearance	—	CLARA	—	CLARA	SLIGHTLY TURBID	SLIGHTLY TURBID
Odor	—	NONE	—	NONE	NONE	NONE
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	1155	NO	1225	0940	1300
Sample Date	SAMPLE	07/30/18	SAMPLE	07/30/18	07/31/18	07/30/18

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: 07/30-31/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	NA	CCR III & IV	CCR III & IV
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	45.95	17.28	73.45	—	61.96	53.45
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	1.61	0.84	5.53	—	2.19	4.96
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.26	0.14	0.90	—	0.36	0.81
Water Removed From Well (gallons)	<del>0.25</del>	—	0.75	—	0.25	0.75
Method of Removal	BAILER	—	BAILER	—	BAILER	PUMP
Was Well Purged Dry?	YES	<del>YES</del>	YES	—	YES	YES
pH (standard units)	—	—	<del>7.39</del>	—	—	8.64
Temperature (°C)	—	—	20.21	—	—	21.02
Conductivity (µmhos/cc)	—	—	9610	—	—	1790
Turbidity (NTU)	—	—	87.1	—	—	40.7
Appearance	—	—	Clear	—	—	CLEAR
Odor	—	—	NONE	—	—	NONE
Purge Time - Begin	—	—	Metals	—	—	Metals
Purge Time - End	—	—	ONLY	—	—	ONLY
Sample Time	NO	NO	<del>0810</del>	—	NO	0850
Sample Date	SAMPLE	SAMPLE	07/31/18	—	SAMPLE	07/31/18

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: 08/29-30/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification		Charge		Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.56	24.49	60.26	35.12	—	25.93
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.69	13.27	1.54	1.63	—	1.28
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.60	2.16	0.25	0.27	—	0.21
Water Removed From Well (gallons)	0.4	—	0.1	0.1	—	0.1
Method of Removal	Bauer	—	Bauer	Bauer	—	Bauer
Was Well Purged Dry?	Yes	—	Yes	Yes	—	Yes
pH (standard units)	—	—	—	—	—	—
Temperature (°C)	—	—	—	—	—	—
Conductivity (µmhos/cc)	—	—	—	—	—	—
Turbidity (NTU)	—	—	—	—	—	—
Appearance	—	—	—	—	—	—
Odor	—	—	—	—	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	—	NO	NO	—	NO
Sample Date	SAMPLE	—	SAMPLE	SAMPLE	—	SAMPLE

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: 08/29-30/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification		Metals IV		Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.67	Dry	31.05	23.47	—	Dry
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.19	—	27.37	9.68	—	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.66	—	4.46	1.58	—	—
Water Removed From Well (gallons)	8.0	—	9.25	6.0	—	—
Method of Removal	Pump	—	Pump	Pump	—	—
Was Well Purged Dry?	No	—	Yes	No	—	—
pH (standard units)	8.11	—	8.06	7.87	—	—
Temperature (°C)	21.87	—	20.53	19.74	—	—
Conductivity (µmhos/cc)	1200	—	959	1280	—	—
Turbidity (NTU)	1.29	—	1.49	1.34	—	—
Appearance	Clear	—	Clear	Clear	—	—
Odor	None	—	None	None	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	0830	No	0815	0900	—	No
Sample Date	08/30/18	SAMPLE	08/30/18	08/29/18	—	SAMPLE

CCADJP

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: 08/29/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	NA	GAUGE	NA	GAUGE	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	—	11.99	—	9.94	—	27.89
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	—	21.55	—	33.36	—	8.82
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	—	3.51	—	5.44	—	1.44
Water Removed From Well (gallons)	—	—	—	—	—	1.25
Method of Removal	—	—	—	—	—	Hand
Was Well Purged Dry?	—	—	—	—	—	Yes
pH (standard units)	—	—	—	—	—	12.56
Temperature (°C)	—	—	—	—	—	20.95
Conductivity (µmhos/cc)	—	—	—	—	—	3470
Turbidity (NTU)	—	—	—	—	—	21.2
Appearance	—	—	—	—	—	Brown TINT
Odor	—	—	—	—	—	None
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	—	—	—	—	—	1040
Sample Date	—	—	—	—	—	08/29/18

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenneth McDonald

DATE: 08/29-30/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification		Metals IV		Metals IV		Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	69.21	25.98	48.25	15.24	19.96	21.53
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.12	10.24	2.09	15.78	24.96	1.41
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.35	1.67	0.34	2.57	4.07	0.23
Water Removed From Well (gallons)	0.25	7.0	0.25	10.0	7.50	0.1
Method of Removal	BALUN	PUMP	BALUN	PUMP	PUMP	BALUN
Was Well Purged Dry?	YES	NO	YES	NO	YES	YES
pH (standard units)	—	8.80	—	8.65	9.17	—
Temperature (°C)	—	21.43	—	20.30	19.63	—
Conductivity (µmhos/cc)	—	870	—	899	1380	—
Turbidity (NTU)	—	440	—	129	245	—
Appearance	—	SLIGHTLY TURBID	—	Clean	SLIGHTLY TURBID	—
Odor	—	Clean NONE	—	NONE	NONE	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	1230	NO	1300	0845	NO
Sample Date	SAMPLE	08/29/18	SAMPLE	08/29/18	08/30/18	SAMPLE

*DUP SHALLOW*

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: 08/29-30/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification		Metals IV		NA		
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	45.79	17.38	74.64	—	61.50	55.06
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	1.77	0.74	4.32	—	2.65	3.35
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.29	0.12	0.70	—	0.43	0.55
Water Removed From Well (gallons)	0.25	0.1	0.5	—	0.25	0.25
Method of Removal	BAILER	BAILER	BAILER	—	BAILER	BAILER
Was Well Purged Dry?	YES	YES	YES	—	YES	YES
pH (standard units)	—	—	7.79	—	—	—
Temperature (°C)	—	—	21.73	—	—	—
Conductivity (µmhos/cc)	—	—	9380	—	—	—
Turbidity (NTU)	—	—	101	—	—	—
Appearance	—	—	SEMI-CLEAR	—	—	—
Odor	—	—	None	—	—	—
Purge Time - Begin	—	—	Metals	—	—	—
Purge Time - End	—	—	Only	—	—	—
Sample Time	NO SAMPLE	NO	0800	—	NO	NO
Sample Date		SAMPLE	08/30/18	—	SAMPLE	SAMPLE

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: 09/18-19/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	CCR III & IV	Gauge	CCR III & IV	Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.52	24.39	60.28	35.19	—	26.03
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.73	13.37	1.52	1.56	—	1.18
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.61	2.18	0.25	0.25	—	0.19
Water Removed From Well (gallons)	0.50	—	0.1	0.1	—	0.1
Method of Removal	BAILER	—	BAILER	BAILER	—	BAILER
Was Well Purged Dry?	YES	—	YES	YES	—	YES
pH (standard units)	—	—	—	—	—	—
Temperature (°C)	—	—	—	—	—	—
Conductivity (µmhos/cc)	—	—	—	—	—	—
Turbidity (NTU)	—	—	—	—	—	—
Appearance	—	—	—	—	—	—
Odor	—	—	—	—	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	—	NO	NO	—	NO
Sample Date	SAMPLE	—	SAMPLE	SAMPLE	—	SAMPLE

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: 09/18-19/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.85	dry	31.92	23.65	—	dry
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.01	—	26.50	9.50	—	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.63	—	4.32	1.55	—	—
Water Removed From Well (gallons)	10.0	—	8.75	7.0	—	—
Method of Removal	Pump	—	Pump	Pump	—	—
Was Well Purged Dry?	No	—	Yes	No	—	—
pH (standard units)	7.84	—	7.72	8.02	—	—
Temperature (°C)	20.52	—	22.41	20.84	—	—
Conductivity (µmhos/cc)	1160	—	905	1180	—	—
Turbidity (NTU)	18.2	—	32.5	24.6	—	—
Appearance	Clean	—	Clean	Clean	—	—
Odor	None	—	None	None	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	1336	NO	1232	1254	—	NO
Sample Date	09/19/18	SAMPLE	09/19/18	09/19/18	—	SAMPLE

CCR DUP	
For 2" well multiply by	0.163
For 4" well multiply by	0.653

SHALLOW  
DUPLICATE

**NORTHEASTERN POWER PLANT  
GROUNDWATER SAMPLING DATA FORM**

SAMPLED BY: Kenny McDonald

DATE: 09/18-19/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	NA	GAUGE	NA	GAUGE	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	—	11.97	—	10.14	—	28.00
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	—	21.57	—	33.16	—	8.71
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	—	3.52	—	5.41	—	1.42
Water Removed From Well (gallons)	—	—	—	—	—	2.25
Method of Removal	—	—	—	—	—	Pump
Was Well Purged Dry?	—	—	—	—	—	YES
pH (standard units)	—	—	—	—	—	<del>11.46</del> 11.46
Temperature (°C)	—	—	—	—	—	21.6
Conductivity (µmhos/cc)	—	—	—	—	—	3280
Turbidity (NTU)	—	—	—	—	—	88.2
Appearance	—	—	—	—	—	Yellish Brown tint
Odor	—	—	—	—	—	NONE
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	—	—	—	—	—	1154
Sample Date	—	—	—	—	—	09/19/18

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: 09/18-19/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	69.13	26.11	48.26	15.27	19.91	21.27
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.20	10.11	2.08	15.75	25.01	1.67
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.36	1.65	0.34	2.57	4.08	0.27
Water Removed From Well (gallons)	0.25	6.0	0.25	10.0	8.25	0.20
Method of Removal	BAILER	Pump	BAILER	Pump	Pump	BAILER
Was Well Purged Dry?	YES	NO	YES	NO	YES	YES
pH (standard units)	—	8.60	—	<del>8.13</del>	8.13	—
Temperature (°C)	—	21.12	—	21.24	20.42	—
Conductivity (µmhos/cc)	—	737	—	802	<del>802</del> 240	—
Turbidity (NTU)	—	25.8	—	18.6	304	—
Appearance	—	CLEAR	—	CLEAR	TURBID	—
Odor	—	NONE	—	NONE	NONE	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	0948	NO	1017	1107	NO
Sample Date	SAMPLE	09/19/18	SAMPLE	09/19/18	09/19/18	SAMPLE

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kerry McDonald

DATE: 09/18-19/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	NA	CCR III & IV	CCR III & IV
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	45.70	17.44	76.03	—	61.34	54.71
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	1.86	0.68	2.93	—	2.81	3.70
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.30	0.11	0.48	—	0.46	0.60
Water Removed From Well (gallons)	0.25	—	0.25	—	0.25	0.50
Method of Removal	BALLOON	—	BALLOON	—	BALLOON	BALLOON
Was Well Purged Dry?	YES	—	YES	—	YES	YES
pH (standard units)	—	—	—	—	—	7.94
Temperature (°C)	—	—	—	—	—	21.28
Conductivity (µmhos/cc)	—	—	—	—	—	1630
Turbidity (NTU)	—	—	—	—	—	24.2
Appearance	—	—	—	—	—	CLEAR
Odor	—	—	—	—	—	None
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	NO	NO	—	NO	1402
Sample Date	SAMPLE	SAMPLE	SAMPLE	—	SAMPLE	09/19/18

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: 10/15/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	CCR III & IV	Gauge	CCR III & IV	Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.45	23.93	60.59	35.25	—	26.14
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.80	13.83	1.21	1.50	—	0.80
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.62	1.80	0.20	0.24	—	0.13
Water Removed From Well (gallons)	0.5	—	0.1	0.1	—	—
Method of Removal	Bailin	—	Bailin	Bailin	—	—
Was Well Purged Dry?	YES	—	YES	YES	—	<del>YES</del>
pH (standard units)	—	—	—	—	—	—
Temperature (°C)	—	—	—	—	—	—
Conductivity (µmhos/cc)	—	—	—	—	—	—
Turbidity (NTU)	—	—	—	—	—	—
Appearance	—	—	—	—	—	—
Odor	—	—	—	—	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	—	NO	NO	—	NO
Sample Date	SAMPLE	—	SAMPLE	SAMPLE	—	SAMPLE

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDaniel

DATE: 10/15/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.49	Dry	32.01	23.51	—	Dry
Water Level Elevation (ft. NGVD)	<del>79.8</del>					
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	9.96	—	26.41	9.64	—	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.62	—	4.30	1.57	—	—
Water Removed From Well (gallons)	8.0	—	9.0	6.0	—	—
Method of Removal	Pump	—	Pump	Pump	—	—
Was Well Purged Dry?	No	—	Yes	No	—	—
pH (standard units)	7.59	—	7.84	7.74	—	—
Temperature (°C)	21.28	—	20.74	20.10	—	—
Conductivity (µmhos/cc)	1270	—	979	1310	—	—
Turbidity (NTU)	97.4	—	42.8	21.8	—	—
Appearance	Clear	—	Clear	Clear	—	—
Odor	None	—	None	None	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	1310	NO	1335	0950	—	NO
Sample Date	10/15/18	Sample	10/15/18	10/15/18	—	Sample

For 2" well multiply by	0.163
For 4" well multiply by	0.653

SHALLOW  
DUP

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonaugh

DATE: 10/15/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	NA	GAUGE	NA	GAUGE	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	—	11.78	—	10.35	—	28.47
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	—	21.76	—	32.95	—	8.24
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	—	3.55	—	5.37	—	1.34
Water Removed From Well (gallons)	—	—	—	—	—	1.0
Method of Removal	—	—	—	—	—	Pump
Was Well Purged Dry?	—	—	—	—	—	Yes
pH (standard units)	—	—	—	—	—	<del>11.42</del> 11.42
Temperature (°C)	—	—	—	—	—	20.76
Conductivity (µmhos/cc)	—	—	—	—	—	3490
Turbidity (NTU)	—	—	—	—	—	102
Appearance	—	—	—	—	—	Brown tint
Odor	—	—	—	—	—	none
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	—	—	—	—	—	1020
Sample Date	—	—	—	—	—	10/15/18

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDaniel

DATE: 10/15/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	69.11	26.11	48.31	14.94	19.97	21.02
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.22	10.11	2.03	16.08	24.95	1.92
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.36	1.65	0.33	2.62	4.07	0.31
Water Removed From Well (gallons)	0.25	10.0	0.25	10.0	8.25	0.25
Method of Removal	BAULK	PUMP	BAULK	PUMP	PUMP	BAULK
Was Well Purged Dry?	YES	NO	YES	NO	YES	YES
pH (standard units)	—	9.03	—	8.55	9.37	—
Temperature (°C)	—	21.28	—	22.31	22.08	—
Conductivity (µmhos/cc)	—	740	—	857	1340	—
Turbidity (NTU)	—	30.4	—	20.4	154	—
Appearance	—	CLEAR	—	CLEAR	SLIGHTLY TURBID	—
Odor	—	NONE	—	NONE	NONE	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	1120	NO	1150	1350	NO
Sample Date	SAMPLE	10/15/18	SAMPLE	10/15/18	10/15/18	SAMPLE

For 2" well multiply by	0.163
For 4" well multiply by	0.653



# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kerrin Mc Donnell

DATE: 10/15/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	CCR III	CCR III & IV	CCR III & IV
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	45.62	17.58	75.58	61.94	61.66	56.02
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	1.92	0.54	3.38	12.27	2.49	2.39
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.32	0.09	0.55	2.00	0.41	0.39
Water Removed From Well (gallons)	0.25	—	0.25	3.50	0.25	0.25
Method of Removal	Pump	—	BAUER	Pump	BAUER	BAUER
Was Well Purged Dry?	YES	<del>YES</del>	YES	YES	YES	YES
pH (standard units)	—	—	—	8.04	—	—
Temperature (°C)	—	—	—	22.46	—	—
Conductivity (µmhos/cc)	—	—	—	1490	—	—
Turbidity (NTU)	—	—	—	164	—	—
Appearance	—	—	—	SLIGHTLY TURBID	—	—
Odor	—	—	—	None	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	NO	NO	1240	NO	NO
Sample Date	SAMPLE	SAMPLE	SAMPLE	10/15/18	SAMPLE	SAMPLE

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonaud

DATE: 10/22/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	NA	NA	NA	NA	Appendix III	NA
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)					37.09	
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)					25.86	
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)					4.22	
Water Removed From Well (gallons)					13.0	
Method of Removal					Pump	
Was Well Purged Dry?					No	
pH (standard units)					7.20	
Temperature (°C)					21.82	
Conductivity (µmhos/cc)					890	
Turbidity (NTU)					52.6	
Appearance					Clean	
Odor					None	
Purge Time - Begin					—	
Purge Time - End					—	
Sample Time					0840	
Sample Date					10/22/18	

For 2" well multiply by	0.163
For 4" well multiply by	0.653

DUP  
LAMPILL

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald

DATE: 10/22/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	Resample	NA	Resample	NA	Appendix III	NA
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.41		41.92		34.34	
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.45		16.50		24.17	
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.70		2.69		3.94	
Water Removed From Well (gallons)	10.0		6.0		8.25	
Method of Removal	Pump		Pump		Pump	
Was Well Purged Dry?	No		Yes		Yes	
pH (standard units)	7.91		7.98		7.25	
Temperature (°C)	21.24		20.94		20.42	
Conductivity (µmhos/cc)	1150		982		1310	
Turbidity (NTU)	42.8		31.6		206	
Appearance	Clear		Clear		Turbid	
Odor	None		None		None	
Purge Time - Begin	—		—		—	
Purge Time - End	—		—		—	
Sample Time	0840		1000		0900	
Sample Date	10/22/18		10/22/18		10/22/18	

Dup

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: 10/22/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	Appendix III	NA	Appendix III	NA	Appendix III	NA
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	13.08		32.72		56.60	
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	45.62		31.78		6.50	
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	7.44		5.18		1.06	
Water Removed From Well (gallons)	19.0		10.5		1.0	
Method of Removal	Pump		Pump		Pump	
Was Well Purged Dry?	YES		YES		YES	
pH (standard units)	7.42		7.12		7.13	
Temperature (°C)	22.39		22.59		20.97	
Conductivity (µmhos/cc)	5820		28400		1820	
Turbidity (NTU)	52.3		28.3		428	
Appearance	Clear		Clear		Turbid	
Odor	None		None		None	
Purge Time - Begin	—		—		—	
Purge Time - End	—		—		—	
Sample Time	1100		1040		0920	
Sample Date	10/22/18		10/22/18		10/22/18	

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: 10/22/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	NA	NA	NA	NA	Resample	NA
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)					19.85	
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)					25.07	
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)					4.09	
Water Removed From Well (gallons)					9.5	
Method of Removal					PUMP	
Was Well Purged Dry?					Yes	
pH (standard units)					8.97	
Temperature (°C)					21.37	
Conductivity (µmhos/cc)					1380	
Turbidity (NTU)					187	
Appearance					TURBID	
Odor					None	
Purge Time - Begin					—	
Purge Time - End					—	
Sample Time					1020	
Sample Date					10/22/18	

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: 10/22/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	NA	NA	NA	Appendix III	NA	NA
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)				60.80		
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)				13.41		
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)				2.19		
Water Removed From Well (gallons)				4.25		
Method of Removal				Pump		
Was Well Purged Dry?				YES		
pH (standard units)				7.79		
Temperature (°C)				22.08		
Conductivity (µmhos/cc)				1420		
Turbidity (NTU)				188		
Appearance				TURBID		
Odor				None		
Purge Time - Begin				—		
Purge Time - End				—		
Sample Time				6940		
Sample Date				10/22/18		

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: 11/28/18

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	CCR III & IV	Gauge	CCR III & IV	Metals IV	B NAF	Metals IV
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.27	24.67	60.19	35.31	36.85	24.55
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	3.98	13.09	1.61	1.44	26.10	2.66
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.65	2.13	0.26	0.23	4.25	0.43
Water Removed From Well (gallons)	0.5	—	—	0.1	13.0	0.25
Method of Removal	Bailin	—	—	BAILIN	Pump	BAILIN
Was Well Purged Dry?	YES	—	—	YES	NO	YES
pH (standard units)	—	—	—	—	8.01	—
Temperature (°C)	—	—	—	—	21.38	—
Conductivity (µmhos/cc)	—	—	—	—	1200	—
Turbidity (NTU)	—	—	—	—	48.3	—
Appearance	—	—	—	—	CLEAR	—
Odor	—	—	—	—	none	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	—	NO	NO	0930	NO
Sample Date	SAMPLE	—	SAMPLE	SAMPLE	11/28/18	SAMPLE

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: 11/28/18

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	F NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	43.19	Dry	28.84	23.79	33.94	Dry
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.67	—	29.58	9.36	24.57	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.74	—	4.82	1.53	4.00	—
Water Removed From Well (gallons)	10.0	—	10.0	8.0	8.25	—
Method of Removal	Pump	—	Pump	Pump	Pump	—
Was Well Purged Dry?	No	—	Yes	No	Yes	—
pH (standard units)	7.89	—	8.06	8.13	7.71	—
Temperature (°C)	17.21	—	20.71	18.24	20.94	—
Conductivity (µmhos/cc)	1150	—	1010	1220	1330	—
Turbidity (NTU)	26.8	—	52.6	18.4	114	—
Appearance	Clean	—	Clean	Clean	Slightly Turbid	—
Odor	None	—	None	None	None	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	0850	—	1135	1125	0950	—
Sample Date	11/28/18	—	11/28/18	11/28/18	11/28/18	—

Dup

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: 11/28/18

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	NA	GAUGE	NA	GAUGE	NA	Metals IV
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	—	11.81	—	8.48	—	28.30
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	—	21.73	—	34.82	—	8.41
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	—	3.54	—	5.68	—	1.37
Water Removed From Well (gallons)	—	—	—	—	—	2.0
Method of Removal	—	—	—	—	—	Pump
Was Well Purged Dry?	—	—	—	—	—	YHS
pH (standard units)	—	—	—	—	—	11.31
Temperature (°C)	—	—	—	—	—	18.04
Conductivity (µmhos/cc)	—	—	—	—	—	3360
Turbidity (NTU)	—	—	—	—	—	127
Appearance	—	—	—	—	—	Brown tint
Odor	—	—	—	—	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	—	—	—	—	—	1020
Sample Date	—	—	—	—	—	11/28/18

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: 11/28/18

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Metals IV	CCR III & IV	Metals IV
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	68.91	26.18	48.28	15.42	19.73	20.68
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.42	70.04	2.06	15.60	25.19	2.26
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.39	1.64	0.34	2.54	4.11	0.34
Water Removed From Well (gallons)	0.25	8.0	0.25	10.0	9.0	0.25
Method of Removal	BAILER	PUMP	BAILER	PUMP	PUMP	PUMP
Was Well Purged Dry?	YES	NO	YES	NO	YES	YES
pH (standard units)	—	8.92	—	8.61	8.94	7.25
Temperature (°C)	—	19.07	—	20.00	21.62	19.28
Conductivity (µmhos/cc)	—	756	—	906	1290	920
Turbidity (NTU)	—	21.4	—	17.6	216	64.3
Appearance	—	CLEAR	—	CLEAR	TURBID	CLEAR
Odor	—	NONE	—	NONE	NONE	NONE
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	1440	NO	1425	1325	1340
Sample Date	SAMPLE	11/28/18	SAMPLE	11/28/18	11/28/18	11/28/18

For 2" well multiply by	0.163
For 4" well multiply by	0.653

SHALLOW  
DWP

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDermid DATE: 11/28/18

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	CCR III & IV	Metals IV	CCR III & IV	Ca NA	CCR III & IV	CCR III & IV
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	45.35	17.65	76.19	61.62	62.36	55.23
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	2.21	0.47	2.77	12.59	1.79	3.18
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.36	0.08	0.45	2.05	0.29	0.52
Water Removed From Well (gallons)	0.25	—	0.25	4.0	—	0.25
Method of Removal	BAILER	—	BAILER	PUMP	—	BAILER
Was Well Purged Dry?	YES	—	YES	YES	—	YES
pH (standard units)	—	—	—	8.26	—	—
Temperature (°C)	—	—	—	21.49	—	—
Conductivity (µmhos/cc)	—	—	—	1380	—	—
Turbidity (NTU)	—	—	—	182	—	—
Appearance	—	—	—	SLIGHTLY TURBID	—	—
Odor	—	—	—	None	—	—
Purge Time - Begin	—	—	—	—	—	—
Purge Time - End	—	—	—	—	—	—
Sample Time	NO	NO	NO	1100	NO	NO
Sample Date	SAMPLE	SAMPLE	SAMPLE	11/28/18	SAMPLE	SAMPLE

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: 01/15-16/19

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Sample Identification	Gauge	Gauge	Gauge	Metals	Gauge	Metals
Elevation of Top of Casing (ft. NGVD)	638.07	638.89	638.19	637.37	630.65	630.19
Depth to Water (ft)	54.06	14.31	49.60	31.12	36.69	21.84
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)				5.63		5.37
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)				0.92		0.88
Water Removed From Well (gallons)				0.75		0.5
Method of Removal				Bailer		Bailer
Was Well Purged Dry?				YES		YES
pH (standard units)				9.52		7.93
Temperature (°C)				19.83		20.04
Conductivity (µmhos/cc)				2180		2240
Turbidity (NTU)				102		122
Appearance				Slightly Turbid		Slightly Turbid
Odor				None		None
Purge Time - Begin				—		—
Purge Time - End				—		—
Sample Time				1715		1620
Sample Date	—	—	—	01/15/19	—	01/15/19

For 2" well multiply by	0.163
For 4" well multiply by	0.653

Shallow  
bup

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald

DATE: 01/15-16/19

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Sample Identification	CCR III	Metals	CCR III	Metals	Gauge	Metals
Elevation of Top of Casing (ft. NGVD)	625.00	624.54	636.84	636.72	636.80	636.66
Depth to Water (ft)	42.90	Dry	25.38	16.01	34.05	0.29
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.96		33.04	17.14		
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.79		5.39	2.79		
Water Removed From Well (gallons)	10.0		10.0	10.0		
Method of Removal	Pump		Pump	Pump		
Was Well Purged Dry?	No		Yes	No		
pH (standard units)	7.51		7.81	8.24		
Temperature (°C)	19.22		20.08	19.87		
Conductivity (µmhos/cc)	1080		1010	1420		
Turbidity (NTU)	41.6		29.8	51.0		
Appearance	Clear		Clear	Slightly Turbid		
Odor	None		None	None		
Purge Time - Begin	—		—	—		
Purge Time - End	—		—	—		
Sample Time	1600		1805	1750		
Sample Date	01/15/19	—	01/15/19	01/15/19	—	—

DUPLICATE

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: 01/15-16/19

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	Gauge	Gauge	Gauge	Gauge	Gauge	Metals
Elevation of Top of Casing (ft. NGVD)	626.45	626.46	629.32	628.71	637.04	636.94
Depth to Water (ft)	13.66	9.98	31.73	7.14	56.52	26.45
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)						10.26
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)						1.67
Water Removed From Well (gallons)						2.0
Method of Removal						Pump
Was Well Purged Dry?						Yes
pH (standard units)						11.16
Temperature (°C)						20.19
Conductivity (µmhos/cc)						3720
Turbidity (NTU)						121
Appearance						Brown tint
Odor						None
Purge Time - Begin						—
Purge Time - End						—
Sample Time						1645
Sample Date	—	—	—	—	—	01/15/19

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: 01/15/19

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	Gauge	Metals	Gauge	Metals	CCR III	Metals
Elevation of Top of Casing (ft. NGVD)	639.32	639.58	628.27	628.75	623.67	623.50
Depth to Water (ft)	68.77	14.54	48.26	10.98	13.14	9.24
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)		21.68		20.04	31.78	13.70
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)		3.53		3.27	5.18	2.23
Water Removed From Well (gallons)		14.0		12.0	10.25	4.0
Method of Removal		Pump		Pump	Pump	Pump
Was Well Purged Dry?		No		No	Yes	Yes
pH (standard units)		8.41		8.37	8.06	7.28
Temperature (°C)		21.01		21.19	20.71	19.21
Conductivity (µmhos/cc)		806		1000	1310	884
Turbidity (NTU)		17.6		15.8	184	41.6
Appearance		Clear		Clear	Turbid	Clear
Odor		None		None	None	None
Purge Time - Begin		—		—	—	—
Purge Time - End		—		—	—	—
Sample Time		1550		1535	1520	1510
Sample Date	—	01/15/19	—	01/15/19	01/15/19	01/15/19

For 2" well multiply by	0.163
For 4" well multiply by	0.653

## NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kennedy McDonald

DATE: 01/15-16/19

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Sample Identification	Gauge	Metals	Gauge	Gauge	Gauge	Gauge
Elevation of Top of Casing (ft. NGVD)	619.06	619.15	640.89	637.71	637.26	636.52
Depth to Water (ft)	45.41	17.32	75.30	50.42	60.02	54.38
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)		0.80				
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)		0.13				
Water Removed From Well (gallons)		—				
Method of Removal		—				
Was Well Purged Dry?		—				
pH (standard units)		—				
Temperature (°C)		—				
Conductivity (µmhos/cc)		—				
Turbidity (NTU)		—				
Appearance		—				
Odor		—				
Purge Time - Begin		—				
Purge Time - End		—				
Sample Time		NU				
Sample Date	—	SAMPLE	—	—	—	—

For 2" well multiply by	0.163
For 4" well multiply by	0.653



# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: KERRY McDONALD

DATE: 02/27/19

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Sample	Appendix III	NA	Appendix III	Appendix IV	Appendix III	Appendix IV
Depth to Water (ft)	53.80	21.94	56.68	32.86	36.98	21.29
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	4.45		5.12	3.89	25.97	5.92
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.73		0.83	0.63	4.23	0.96
Water Removed From Well (gallons)	0.5		3.0	1.25	13.0	1.0
Method of Removal	BALM		Pump	Pump	Pump	Pump
Was Well Purged Dry?	Yes		No	Yes	No	Yes
pH (standard units)	—		11.03	8.90	7.80	7.38
Temperature (°C)	—		17.91	18.24	18.04	17.42
Conductivity (µmhos/cc)	—		1570	2920	934	2780
Turbidity (NTU)	—		134	116	38.9	134
Appearance	—		SLIGHTLY TURBID	SLIGHTLY TURBID	CLEAR	SLIGHTLY TURBID
Odor	—		NONE	NONE	NONE	NONE
Ohio Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	—	250 mL Unpres 250mL HNO3	—
Shreveport Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	500 mL HNO3	250 mL Unpres 250mL HNO3	500 mL HNO3
Sample Time	—	—	1200	1140	900	920
Sample Date	—	—	02/27/19	02/27/19	02/27/19	02/27/19

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: 02/27/19

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Appendix III	NA	Appendix III	NA	Appendix III	Appendix IV
Depth to Water (ft)	43.23	Dry	24.81	20.87	34.12	Dry
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.63		33.61		24.39	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.73		5.48		3.98	—
Water Removed From Well (gallons)	10.0		10.25		8.0	
Method of Removal	Pump		Pump		Pump	
Was Well Purged Dry?	NO		YES		YES	
pH (standard units)	7.66		8.45		7.62	
Temperature (°C)	16.80		17.41		18.24	
Conductivity (µmhos/cc)	1243		773		1420	
Turbidity (NTU)	21.6		52.1		108	
Appearance	CLEAR		CLEAR		SUBSTANTIAL TURBID	
Odor	NONE		NONE		NONE	
Ohio Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	
Shreveport Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	500 mL HNO3
Sample Time	0835		1225		1000	
Sample Date	02/27/19		02/27/19		02/27/19	

DUPLICATE

For 2" well multiply by	0.163
For 4" well multiply by	0.653

LAMPFILL

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald DATE: 02/27/19

Well Identification Number	MW-7D	MW-7S	MW-8D	MW-8S	MW-9D	MW-9S
Sample Identification	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Elevation of Top of Casing (ft. NGVD)	Appendix III	NA	Appendix III	NA	Appendix III	Appendix IV
Depth to Water (ft)	12.38	11.55	26.23	7.17	55.76	26.64
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	46.32		38.27		7.34	10.07
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	7.55		6.24		1.20	1.64
Water Removed From Well (gallons)	18.0		10.75		1.0	2.25
Method of Removal	Pump		Pump		Pump	Pump
Was Well Purged Dry?	Yes		Yes		Yes	Yes
pH (standard units)	8.28		8.03		7.58	12.34
Temperature (°C)	19.12		18.49		17.81	18.38
Conductivity (µmhos/cc)	6240		22400		1930	4240
Turbidity (NTU)	38.7		58.6		342	147
Appearance	CLEAR		CLEAR		TURBID	BROWN TINT
Odor	NONE		NONE		NONE	NONE
Ohio Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	—
Shreveport Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	500 mL HNO3
Sample Time	0810		1350		1022	1045
Sample Date	02/27/19		02/27/19		02/27/19	02/27/19

For 2" well multiply by	0.163
For 4" well multiply by	0.653

SHALLOW  
POLLUTE

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald . DATE: 02/27/19 .

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Sample Identification	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Elevation of Top of Casing (ft. NGVD)	Appendix III	NA	Appendix III	NA	Appendix III	Appendix IV
Depth to Water (ft)	68.64	20.58	48.26	12.20	16.95	12.01
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	2.69		2.08		27.97	10.93
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.44		0.34		4.56	1.78
Water Removed From Well (gallons)	0.25		0.25		10.25	4.0
Method of Removal	BAILM		BAILM		PUMP	PUMP
Was Well Purged Dry?	YES		YES		YES	YES
pH (standard units)	—		—		8.45	7.57
Temperature (°C)	—		—		18.04	18.71
Conductivity (µmhos/cc)	—		—		1230	983
Turbidity (NTU)	—		—		158	44.6
Appearance	—		—		TURBID	CLEAN
Odor	—		—		NONE	NONE
Ohio Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	—
Shreveport Containers	250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3		250 mL Unpres 250mL HNO3	500 mL HNO3
Sample Time	—	—	—	—	1325	1300
Sample Date	—		—		02/27/19	02/27/19

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: 02/27/19

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Appendix III	Appendix IV	Appendix III	Appendix III	Appendix III	Appendix III
Depth to Water (ft)	42.84	15.29	74.45	58.24	62.66	53.65
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	4.72	2.83	4.51	15.97	1.49	4.76
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.77	0.46	0.74	2.60	0.24	0.78
Water Removed From Well (gallons)	0.50	0.25	0.50	4.25	—	0.50
Method of Removal	Pump	Bail	Bail	Pump	—	Bail
Was Well Purged Dry?	Yes	Yes	Yes	Yes	—	Yes
pH (standard units)	—	—	—	8.60	—	—
Temperature (°C)	—	—	—	19.25	—	—
Conductivity (µmhos/cc)	—	—	—	1245	—	—
Turbidity (NTU)	—	—	—	142	—	—
Appearance	—	—	—	Turbid	—	—
Odor	—	—	—	None	—	—
Ohio Containers	250 mL Unpres 250mL HNO3	—	250 mL Unpres 250mL HNO3	250 mL Unpres 250mL HNO3	250 mL Unpres 250mL HNO3	250 mL Unpres 250mL HNO3
Shreveport Containers	250 mL Unpres 250mL HNO3	500 mL HNO3	250 mL Unpres 250mL HNO3	250 mL Unpres 250mL HNO3	250 mL Unpres 250mL HNO3	250 mL Unpres 250mL HNO3
Sample Time	—	—	—	1120	—	—
Sample Date	—	—	—	02/27/19	—	—

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: 08/26/19

Well Identification Number	MW-1D	MW-1S	MW-2D	MW-2S	MW-3D	MW-3S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Appendix III	NA	Appendix III	Appendix IV Metals	Appendix III	Appendix IV Metals
Depth to Water (ft)	52.71	23.95	57.91	32.54	37.34	22.94
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.25	37.76	61.80	36.75	62.95	27.21
Height of Water Column (ft.)	5.54	13.81	3.89	4.21	25.61	4.27
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.90	2.25	0.63	0.69	4.17	0.70
Water Removed From Well (gallons)	0.75	—	3.0	1.75	13.0	1.0
Method of Removal	BAITR	—	Pump	Pump	Pump	Pump
Was Well Purged Dry?	YES	—	NO	YES	NO	YES
pH (standard units)	—	—	12.79	12.90	8.46	8.23
Temperature (°C)	—	—	23.28	22.91	22.41	22.83
Conductivity (µmhos/cc)	—	—	1900	2370	1060	3060
Turbidity (NTU)	—	—	93.0	118	246	217
Appearance	—	—	SLIGHTLY TURBID	BROWN FINE	SLIGHTLY TURBID	SLIGHTLY TURBID
Odor	—	—	NONE	NONE	NONE	NONE
Ohio Containers	250mL HNO3	—	250mL HNO3	—	250mL HNO3	—
Shreveport Containers	1L Unpres	—	1L Unpres	500 mL HNO3	1L Unpres	500 mL HNO3
Sample Time	—	—	1530	1535	1444	1450
Sample Date	—	—	08/26/19	08/26/19	08/26/19	08/26/19

For 2" well multiply by	0.163
For 4" well multiply by	0.653

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: KERRY Mc DONALD/MATT HAMILTON

DATE: 08/26/19

Well Identification Number	MW-4D	MW-4S	MW-5D	MW-5S	MW-6D	MW-6S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Appendix III	NA	Appendix III	Appendix IV Metals	Appendix III	Appendix IV Metals
Depth to Water (ft)	43.73	Dry	24.20	22.88	32.83	Dry
Water Level Elevation (ft. NGVD)		—				—
Measured Depth Total Depth of Well (ft.)	53.86	32.94	58.42	33.15	58.51	28.20
Height of Water Column (ft.)	10.13	—	34.22	5.40	25.68	—
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.65	—	5.58	0.88	4.19	—
Water Removed From Well (gallons)	10.0	—	13.25	3.0	9.5	—
Method of Removal	Pump	—	Pump	Pump	Pump	—
Was Well Purged Dry?	NO	✓	YES	NO	YES	—
pH (standard units)	8.13	—	9.81	8.45	8.58	—
Temperature (°C)	23.98	—	22.44	21.39	23.16	—
Conductivity (µmhos/cc)	1230	—	1040	1160	1500	—
Turbidity (NTU)	88.2	✓	198	158	303	—
Appearance	CLEAR	—	CLEAR	CLEAR	SLIGHTLY TURBID	—
Odor	NONE	—	NONE	NONE	NONE	—
Ohio Containers	250mL HNO3	—	250mL HNO3	—	250mL HNO3	—
Shreveport Containers	1L Unpres	—	1L Unpres	500 mL HNO3	1L Unpres	500 mL HNO3
Sample Time	1433	—	1540	1550	1500	—
Sample Date	08/26/19	—	08/26/19	08/26/19	08/26/19	—

LANDFILL

For 2" well multiply by	0.163
For 4" well multiply by	0.653

DJP

SLURRY  
WALL  
DUPLICATE

# NORTHEASTERN POWER PLANT GROUNDWATER SAMPLING DATA FORM

SAMPLED BY: Kenny McDonald / Matt Hamilton DATE: 08/26/19

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	Appendix III	Appendix IV Metals
Depth to Water (ft)	11.45	11.48	23.13	9.30	53.55	26.26
Water Level Elevation (ft. NGVD)						
Measured Depth Total Depth of Well (ft.)	58.70	33.54	64.50	43.30	63.10	36.71
Height of Water Column (ft.)	47.25	22.06	41.37	34.00	9.55	10.45
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	7.70	3.60	6.74	5.54	1.56	1.70
Water Removed From Well (gallons)	—	—	—	—	2.25	2.5
Method of Removal	—	—	—	—	Pump	pump
Was Well Purged Dry?	—	—	—	—	Yes	Yes
pH (standard units)	—	—	—	—	8.82	12.41
Temperature (°C)	—	—	—	—	23.25	21.39
Conductivity (µmhos/cc)	—	—	—	—	1550	4180
Turbidity (NTU)	—	—	—	—	128	130
Appearance	—	—	—	—	Slightly Turbid	Brown tint
Odor	—	—	—	—	None	None
Ohio Containers	—	—	—	—	250mL HNO3	—
Shreveport Containers	—	—	—	—	1L Unpres	500 mL HNO3
Sample Time	—	—	—	—	1510	1515
Sample Date	—	—	—	—	08/26/19	08/26/19

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: 08/26/19

Well Identification Number	MW-10D	MW-10S	MW-11D	MW-11S	MW-12D	MW-12S
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Appendix III	Appendix IV Metals	Appendix III	Appendix IV Metals	Appendix III	Appendix IV Metals
Depth to Water (ft)	67.96	25.19	48.11	LARG	18.66	15.71
Water Level Elevation (ft. NGVD)				WASP NEST INSIDE OF PROTECTIVE		
Measured Depth Total Depth of Well (ft.)	71.33	36.22	50.34	31.02	44.92	22.94
Height of Water Column (ft.)	3.37	11.03	2.23		26.26	7.23
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	0.55	1.80	0.36		4.28	1.18
Water Removed From Well (gallons)	0.50	6.0	—		10.0	3.0
Method of Removal	BALUN	PUMP	—		PUMP	PUMP
Was Well Purged Dry?	YES	NO	✓		YES	YES
pH (standard units)	—	7.60	—		8.68	7.31
Temperature (°C)	—	21.44	—		20.29	24.72
Conductivity (µmhos/cc)	—	915	—		1410	1150
Turbidity (NTU)	—	30.0	—		469	52.3
Appearance	—	CLEAR	—		SLIGHTLY TURBID	CLEAR
Odor	—	NONE	—		NONE	NONE
Ohio Containers	250mL HNO3	—	250mL HNO3	—	250mL HNO3	—
Shreveport Containers	1L Unpres	500 mL HNO3	1L Unpres	500 mL HNO3	1L Unpres	500 mL HNO3
Sample Time	—	1320	—	—	1405	1355
Sample Date	—	08/26/19	—	—	08/26/19	08/26/19

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: 08/26/19

Well Identification Number	MW-13D	MW-13S	MW-14	MW-15	MW-16	MW-17
Activities	Gauge	Gauge	Gauge	Gauge	Gauge	Gauge
Samples	Appendix III	Appendix IV Metals	Appendix III	Appendix III	Appendix III	Appendix III
Depth to Water (ft)	37.42	17.16	68.82	<del>62.60</del>	62.60	50.89
Water Level Elevation (ft. NGVD)				59.72	—	
Measured Depth Total Depth of Well (ft.)	47.56	18.12	78.96	74.21	64.15	58.41
Height of Water Column (ft.)	10.14	6.96	10.14	14.49	—	7.52
Well Size (I.D.) (inches)	2	2	2	2	2	2
Volume of Water in Well (gallons)	1.65	0.16	1.65	2.36	—	1.23
Water Removed From Well (gallons)	1.50	—	1.75	5.0	—	1.0
Method of Removal	Pump	—	Pump	Pump	—	Pump
Was Well Purged Dry?	Yes	—	Yes	10.5 / Yes	—	Yes
pH (standard units)	—	—	8.57	<del>8.57</del>	—	—
Temperature (°C)	—	—	22.75	23.13	—	—
Conductivity (µmhos/cc)	—	—	10200	1560	—	—
Turbidity (NTU)	—	—	20.3	198	—	—
Appearance	—	—	Clear	Slightly Turbid	—	—
Odor	—	—	none	none	—	—
Ohio Containers	250mL HNO3	—	250mL HNO3	250mL HNO3	250mL HNO3	250mL HNO3
Shreveport Containers	1L Unpres	500 mL HNO3	1L Unpres	1L Unpres	1L Unpres	1L Unpres
Sample Time	—	—	1600	1525	—	—
Sample Date	—	—	08/26/19	08/26/19	—	—

For 2" well multiply by	0.163
For 4" well multiply by	0.653

**ATTACHMENT B**  
**Laboratory Analytical Reports**



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 36899	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 01/24/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 212939	<b>Collected Date:</b> 01/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-6D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (212939)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Boron	4.24	mg/L	0.014	1:50	EPA 6010B 1996	01/31/2018 17:04		JDB

<b>Water (212939)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Fluoride	0.76	mg/L	0.083	1	EPA 300.0	02/07/2018 0:00	Q18,J	Q18
Sulfate	494	mg/L	0.140	1	EPA 300.0	02/07/2018 0:00	Q18	Q18

<b>AEP Sample ID</b> : 212940	<b>Collected Date:</b> 01/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-9D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (212940)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Boron	7.43	mg/L	0.014	1:50	EPA 6010B 1996	01/31/2018 17:10		JDB

<b>AEP Sample ID</b> : 212941	<b>Collected Date:</b> 01/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-15	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (212941)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Boron	9.16	mg/L	0.014	1:50	EPA 6010B 1996	01/31/2018 17:15		JDB

<b>AEP Sample ID</b> : 212942	<b>Collected Date:</b> 01/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> SP-1	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (212942)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Calcium	119	mg/L	0.48	1:50	EPA 6010B 1996	01/31/2018 17:21		JDB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 36899	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 01/24/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 212943	<b>Collected Date:</b> 01/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> SP-2	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Water (212943)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	975	mg/L	0.219	1	EPA 300.0	02/07/2018 0:00	Q18	Q18
Solids, Total Dissolved (TDS)	1910	mg/L	2	1	SM 2540 C-2011	01/26/2018 17:00		LBH

<b>AEP Sample ID</b> : 212944	<b>Collected Date:</b> 01/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> SP-10	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (212944)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Boron	1.08	mg/L	0.00028	1	EPA 6010B 1996	01/31/2018 18:30		JDB

<b>Water (212944)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	1630	mg/L	0.219	1	EPA 300.0	02/07/2018 0:00	Q18	Q18
Fluoride	5.71	mg/L	0.083	1	EPA 300.0	02/07/2018 0:00	Q18	Q18
Solids, Total Dissolved (TDS)	3236	mg/L	2	1	SM 2540 C-2011	01/26/2018 17:00		LBH
Sulfate	63.1	mg/L	0.140	1	EPA 300.0	02/07/2018 0:00	Q18	Q18

<b>AEP Sample ID</b> : 212945	<b>Collected Date:</b> 01/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> SP-11	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Water (212945)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	470	mg/L	0.219	1	EPA 300.0	02/07/2018 0:00	Q18	Q18
Fluoride	2.96	mg/L	0.083	1	EPA 300.0	02/07/2018 0:00	Q18	Q18
Solids, Total Dissolved (TDS)	1544	mg/L	2	1	SM 2540 C-2011	01/26/2018 17:00		LBH
Sulfate	222	mg/L	0.140	1	EPA 300.0	02/07/2018 0:00	Q18	Q18



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

**Report ID** : 36899  
**Date Received:** 01/24/2018

**Company:** SEP - Environmental (JP-W)  
**Contact:** Jill Parker-Witt  
**Phone:** (318) 673-3816

**Address:** 502 N. Allen Avenue  
Shreveport, LA 71101  
**Fax:** (318) 673-3960


### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
1/31/2018	Boron	212939.2	<0.014	0.3	0.30296	101.0	0.3	0.2841	94.7		0.5	JDB
1/26/2018	Solids, Total Dissolved (TDS)	212943.1									2.2	LBH
1/26/2018	Solids, Total Dissolved (TDS)		<2									LBH
1/26/2018	Solids, Total Dissolved (TDS)			196	184	93.9						LBH
1/26/2018	Solids, Total Dissolved (TDS)						3120	2914	93.4			LBH

#### Code Code Description

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- Q18 Analysis was performed by a contracted Laboratory. See attached report.

  
Laboratory Manager

08-Feb-18  
Report Date

# Chain of Custody Record

*SK*  
11/22/18

**Shreveport Chemical Laboratory (SCL)**  
502 N. Allen Ave.  
Shreveport, LA 71101  
Jonathan Barmhill (318-673-3803)  
Contacts: John Davis (318-673-3811)

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

Project Name: Northeastern PP CCR  
Contact Name: Jill Parker-Witt  
Contact Phone: 318-673-3816

Analyte Turnaround Time (in Calendar Days)  
• Routine (28 days for Monitoring Wells)

COC# 34899

Sampler(s): Kenneth McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials						Sample Specific Notes:	
						Fluoride, Sulfate	TDS, Chloride	TDS, Chloride, Fluoride, Sulfate	Boron	Calcium			
MM-6D	1/22/2018	1400	G	GW	2	X			X				212939.1 - 212939.2
MM-9D	1/22/2018	1340	G	GW	1				X				212940
MM-15	1/22/2018	1320	G	GW	1				X				212941
SP-1	1/22/2018	1520	G	GW	1						X		212942
SP-2	1/22/2018	1500	G	GW	1		X						212943
SP-10	1/22/2018	1420	G	GW	2			X	X				212944.1 - 212944.2
SP-11	1/22/2018	1440	G	GW	1			X					212945
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=N+OH; 6= Other _____; F= filter in field						1	1	1	4	4			

Special Instructions/QC Requirements & Comments:

Relinquished by: *KRM* Company: *CHOLC* Date/Time: *01/29/18 1116* Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received in Laboratory by: *[Signature]* Date/Time: *1/29/18 1116*



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Panker  
 Received By LBH  
 Received Date 1/24/18  
 Open Date \_\_\_\_\_

Sample Matrix  
 DGA     PCB Oil     Water     Oil     Soil  
 Solid     Liquid     Other \_\_\_\_\_

Container Temp    Read 1.5°C  
Thermometer Serial #F04103  
 Correction Factor +1  
 Corrected Temp 2.5°C

Project I.D. 36899

Were samples received on ice?  YES     NO

- Did container arrive in good condition?  YES     NO
- Was sample documentation received?  YES     NO
- Was documentation filled out properly?  YES     NO
- Were samples labeled properly?  YES     NO
- Were correct containers used?  YES     NO
- Were the pH's of samples appropriately checked?  YES     NO
- Total number of sample containers 9

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_







Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

**Water Analysis**

**Location: Shreveport Chemical Laboratory**

**Report Date: 2/8/2018**

<b>MW-6D</b>						<b>Northeastern Plant</b>			
<b>Sample Number:</b>	<b>180447-001</b>	<b>Date Collected:</b>				<b>01/22/2018 14:00</b>	<b>Date Received:</b>		<b>2/7/2018</b>

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Fluoride, F	0.76	mg/L		0.2	0.05	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	494	mg/L		1	0.5	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0

Northeastern Plant

<b>SP-2</b>						<b>Northeastern Plant</b>			
<b>Sample Number:</b>	<b>180447-002</b>	<b>Date Collected:</b>				<b>01/22/2018 15:00</b>	<b>Date Received:</b>		<b>2/7/2018</b>

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	975	mg/L		8	2	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0

Northeastern Plant

<b>SP-10</b>						<b>Northeastern Plant</b>			
<b>Sample Number:</b>	<b>180447-003</b>	<b>Date Collected:</b>				<b>01/22/2018 14:20</b>	<b>Date Received:</b>		<b>2/7/2018</b>

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	1630	mg/L		8	2	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0
Fluoride, F	5.71	mg/L		0.8	0.2	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	63.1	mg/L		1	0.5	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0

Northeastern Plant

<b>SP-11</b>						<b>Northeastern Plant</b>			
<b>Sample Number:</b>	<b>180447-004</b>	<b>Date Collected:</b>				<b>01/22/2018 14:40</b>	<b>Date Received:</b>		<b>2/7/2018</b>

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	470	mg/L		8	2	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0
Fluoride, F	2.96	mg/L		0.3	0.1	CRJ	02/08/2018	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	222	mg/L		0.5	0.2	CRJ	02/08/2018	EPA 300.1-1997, Rev. 1.0

Northeastern Plant

<b>AD-11</b>						<b>Welsh Plant</b>			
<b>Sample Number:</b>	<b>180447-005</b>	<b>Date Collected:</b>				<b>01/18/2018 10:42</b>	<b>Date Received:</b>		<b>2/7/2018</b>

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Sulfate, SO4	377	mg/L		2	1	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0

Welsh Plant

**AD-13** **Welsh Plant**

Sample Number: 180447-006                      Date Collected: 01/18/2018 11:37                      Date Received: 2/7/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Sulfate, SO4	383	mg/L		2	1	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0

Welsh Plant

**AD-14** **Welsh Plant**

Sample Number: 180447-007                      Date Collected: 01/18/2018 11:12                      Date Received: 2/7/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	6.43	mg/L		0.06	0.02	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0

Welsh Plant

**AD-16** **Welsh Plant**

Sample Number: 180447-008                      Date Collected: 01/18/2018 12:12                      Date Received: 2/7/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Sulfate, SO4	58.6	mg/L		0.1	0.04	TEA	02/07/2018	EPA 300.1-1997, Rev. 1.0

Welsh Plant

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit  
J: Analyte was positively identified, though the quantitation was below Reporting Limit.



**Dave Conover, Chemist Principal**

Email [dpconover@aep.com](mailto:dpconover@aep.com)      Tel. 614-836-4219

Fax 614-836-4168                      Audinet 210-4219

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**





SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

### CHAIN OF CUSTODY

OPCO/PROJECT NAME		FAX NO.		Analysis Requested																	
AEPW-SCL / Welsh PP CCR		318-673-3839		C	h	i	o	r	i	d	e	s	S	u	i	l	f	a	t	e	
Sandra Wallace contact person		318-673-3802																			
DATE	TIME	SAMPLE SOURCE & DESCRIPTION	SAMPLE I.D.	G	R	A	B	NUMBER OF CONTAINERS													
18-Jan-18	10:42	AD-11	212798	<input checked="" type="checkbox"/>				1					X								
18-Jan-18	11:37	AD-13	212799					1					X								
18-Jan-18	11:12	AD-14	212800					1					X								
18-Jan-18	12:12	AD-16	212801					1					X								
RELINQUISHED BY (SIGN)		DATE/TIME	RECEIVED BY	RELINQUISHED BY (SIGN)		DATE/TIME	RECEIVED BY														
<i>[Signature]</i>		2/6/18 1335	<i>[Signature]</i>																		
RECEIVED FOR LABORATORY				S. [Signature]																	
				02-07-18		10:25															



**WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>				<u>Delivery Type</u>			
Cooler	Box	Bag	Envelope	PONY	UPS	FedEX	USPS
				Other _____			
Plant/Customer <u>Northeastern</u>				Number of Plastic Containers: <u>8</u>			
Opened By <u>SM</u>				Number of Glass Containers: _____			
Date/Time <u>02-07-18 10:25</u>				Number of Mercury Containers: _____			
Were all temperatures within 0-6°C? <u>Y</u> /N or N/A Initial: <u>SM</u> on ice / no ice							
# (IR Gun Ser# <u>170779030</u> Expir. <u>11-06-19</u> ) - If No, specify each deviation: _____							
Was container in good condition? <u>Y</u> /N Comments _____							
Was Chain of Custody received? <u>Y</u> /N Comments _____							
Requested turnaround: _____ If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: SM 02-07-18

- 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# 180447 Initial & Date & Time : \_\_\_\_\_

Logged by SM Comments: \_\_\_\_\_

Reviewed by MCO \_\_\_\_\_

**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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 216017	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-2D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216017)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.00212	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 4:09	J	JDB
Arsenic	0.03715	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 4:09		JDB
Barium	0.00962	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 4:09		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 4:09	U	JDB
Boron	10.5	mg/L	0.014	1:50	EPA 6010B 1996	05/30/2018 20:12		JDB
Cadmium	0.0003	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 4:09	J	JDB
Calcium	7.52	mg/L	0.0096	1	EPA 6010B 1996	05/31/2018 4:09		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 4:09	U	JDB
Cobalt	0.00036	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 4:09	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 4:09	U	JDB
Lithium	0.0006	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 4:09	J	JDB
Mercury	0.000046	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 13:42		LNM
Molybdenum	0.588	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 4:09		JDB
Selenium	0.08277	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 4:09		JDB
Thallium	0.0011	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 4:09	J	JDB

<b>Water (216017)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	14	mg/L	0.219	1	EPA 300.0	05/16/2018 23:48		GB
Fluoride	2.028	mg/L	0.083	1	EPA 300.0	05/16/2018 23:48		GB
Solids, Total Dissolved (TDS)	1206	mg/L	2	1	SM 2540 C-2011	05/07/2018 10:00		LBH
Sulfate	628	mg/L	0.140	1:10	EPA 300.0	05/17/2018 0:07		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 216018	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-3D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216018)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 4:14	U	JDB
Arsenic	0.00138	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 4:14	J	JDB
Barium	0.107	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 4:14		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 4:14	U	JDB
Boron	1.08	mg/L	0.00028	1	EPA 6010B 1996	05/31/2018 4:14		JDB
Cadmium	0.00009	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 4:14	J	JDB
Calcium	127	mg/L	0.48	1:50	EPA 6010B 1996	05/30/2018 20:17		JDB
Chromium	0.00024	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 4:14	J	JDB
Cobalt	0.00104	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 4:14	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 4:14	U	JDB
Lithium	0.01568	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 4:14		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 13:50	U	LNM
Molybdenum	0.00293	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 4:14	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 4:14	U	JDB
Thallium	< 0.00086	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 4:14	U	JDB

<b>Water (216018)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	13	mg/L	0.219	1	EPA 300.0	05/17/2018 0:26		GB
Fluoride	0.757	mg/L	0.083	1	EPA 300.0	05/17/2018 0:26	U	GB
Solids, Total Dissolved (TDS)	736	mg/L	2	1	SM 2540 C-2011	05/07/2018 10:00		LBH
Sulfate	196	mg/L	0.140	1:10	EPA 300.0	05/17/2018 0:45		GB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.





# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216019	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216019)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.00405	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 4:30	J	JDB
Arsenic	0.0023	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 4:30	J	JDB
Barium	0.171	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 4:30		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 4:30	U	JDB
Boron	1.21	mg/L	0.00028	1	EPA 6010B 1996	05/31/2018 4:30		JDB
Cadmium	0.00014	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 4:30	J	JDB
Calcium	192	mg/L	0.48	1:50	EPA 6010B 1996	05/30/2018 20:22		JDB
Chromium	0.00137	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 4:30		JDB
Cobalt	0.00236	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 4:30	J	JDB
Lead	0.00147	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 4:30	J	JDB
Lithium	0.00533	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 4:30		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 14:12	U	LNM
Molybdenum	0.00674	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 4:30		JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 4:30	U	JDB
Thallium	0.00119	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 4:30	J	JDB

<b>Water (216019)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	22	mg/L	0.219	1	EPA 300.0	05/17/2018 1:04		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	05/17/2018 1:04	U	GB
Solids, Total Dissolved (TDS)	984	mg/L	2	1	SM 2540 C-2011	05/07/2018 10:00		LBH
Sulfate	328	mg/L	0.140	1:10	EPA 300.0	05/17/2018 1:22		GB



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<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216020	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216020)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.00291	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Arsenic	0.00124	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Barium	0.127	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 4:57		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 4:57	U	JDB
Boron	0.476	mg/L	0.00028	1	EPA 6010B 1996	05/31/2018 4:57		JDB
Cadmium	0.00036	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Calcium	132	mg/L	0.48	1:50	EPA 6010B 1996	05/30/2018 20:27		JDB
Chromium	0.00059	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Cobalt	0.00114	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Lead	0.00101	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Lithium	0.01243	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 4:57		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 14:20	U	LNM
Molybdenum	0.00133	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Selenium	0.00135	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB
Thallium	0.00125	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 4:57	J	JDB

<b>Water (216020)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	25	mg/L	0.219	1	EPA 300.0	01/17/2018 1:41		GB
Fluoride	0.703	mg/L	0.083	1	EPA 300.0	05/17/2018 1:41	J	GB
Solids, Total Dissolved (TDS)	636	mg/L	2	1	SM 2540 C-2011	05/07/2018 10:00		LBH
Sulfate	126	mg/L	0.140	1:10	EPA 300.0	05/17/2018 2:00		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 216021	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-6D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216021)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.00132	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 5:02	J	JDB
Arsenic	0.00238	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 5:02	J	JDB
Barium	0.07224	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 5:02		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 5:02	U	JDB
Boron	3.52	mg/L	0.014	1:50	EPA 6010B 1996	05/30/2018 20:32		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 5:02	U	JDB
Calcium	173	mg/L	0.48	1:50	EPA 6010B 1996	05/30/2018 20:32		JDB
Chromium	0.00151	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 5:02		JDB
Cobalt	0.00182	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 5:02	J	JDB
Lead	0.00129	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 5:02	J	JDB
Lithium	0.01975	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 5:02		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 14:23	U	LNM
Molybdenum	0.09145	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 5:02		JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 5:02	U	JDB
Thallium	0.00102	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 5:02	J	JDB

<b>Water (216021)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	31	mg/L	0.219	1	EPA 300.0	05/17/2018 2:19		GB
Fluoride	0.806	mg/L	0.083	1	EPA 300.0	05/17/2018 2:19	J	GB
Solids, Total Dissolved (TDS)	1062	mg/L	2	1	SM 2540 C-2011	05/07/2018 10:00		LBH
Sulfate	406	mg/L	0.140	1:10	EPA 300.0	05/17/2018 2:38		GB

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# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 216022	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216022)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 5:07	U	JDB
Arsenic	0.00156	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 5:07	J	JDB
Barium	0.121	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 5:07		JDB
Beryllium	0.00013	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 5:07	J	JDB
Boron	8.63	mg/L	0.014	1:50	EPA 6010B 1996	05/30/2018 20:37		JDB
Cadmium	0.0008	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 5:07	J	JDB
Calcium	184	mg/L	0.48	1:50	EPA 6010B 1996	05/30/2018 20:37		JDB
Chromium	0.00795	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 5:07		JDB
Cobalt	0.00352	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 5:07	J	JDB
Lead	0.00703	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 5:07		JDB
Lithium	0.00841	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 5:07		JDB
Mercury	0.000013	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 14:25	J	LNM
Molybdenum	0.693	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 5:07		JDB
Selenium	0.0045	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 5:07	J	JDB
Thallium	< 0.00086	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 5:07	U	JDB

<b>Water (216022)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Chloride	17	mg/L	0.219	1	EPA 300.0	05/17/2018 3:53		GB
Fluoride	2.199	mg/L	0.083	1	EPA 300.0	05/17/2018 3:53		GB
Solids, Total Dissolved (TDS)	1044	mg/L	2	1	SM 2540 C-2011	05/07/2018 10:00		LBH
Sulfate	541	mg/L	0.140	1:10	EPA 300.0	05/17/2018 4:12		GB



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<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216023	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-13D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216023)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 5:12	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 5:12	U	JDB
Barium	0.04884	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 5:12		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 5:12	U	JDB
Boron	1.08	mg/L	0.00028	1	EPA 6010B 1996	05/31/2018 5:12		JDB
Cadmium	0.00013	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 5:12	J	JDB
Calcium	172	mg/L	0.48	1:50	EPA 6010B 1996	05/30/2018 20:42		JDB
Chromium	0.0008	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 5:12	J	JDB
Cobalt	0.00161	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 5:12	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 5:12	U	JDB
Lithium	0.02997	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 5:12		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 14:28	U	LNM
Molybdenum	0.01238	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 5:12		JDB
Selenium	0.01193	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 5:12		JDB
Thallium	< 0.00086	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 5:12	U	JDB

<b>Water (216023)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	5	mg/L	0.219	1	EPA 300.0	05/17/2018 5:08		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	05/17/2018 5:08	U	GB
Solids, Total Dissolved (TDS)	1064	mg/L	2	1	SM 2540 C-2011	05/08/2018 14:00		JTD
Sulfate	354	mg/L	0.140	1:10	EPA 300.0	05/17/2018 5:27		GB



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<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216024	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> DUP	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216024)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 5:18	U	JDB
Arsenic	0.00111	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 5:18	J	JDB
Barium	0.109	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 5:18		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 5:18	U	JDB
Boron	1.01	mg/L	0.00028	1	EPA 6010B 1996	05/31/2018 5:18		JDB
Cadmium	0.0001	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 5:18	J	JDB
Calcium	124	mg/L	0.48	1:50	EPA 6010B 1996	05/30/2018 20:57		JDB
Chromium	0.0007	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 5:18	J	JDB
Cobalt	0.00127	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 5:18	J	JDB
Lead	0.0008	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 5:18	J	JDB
Lithium	0.01516	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 5:18		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 14:31	U	LNM
Molybdenum	0.00259	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 5:18	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 5:18	U	JDB
Thallium	< 0.00086	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 5:18	U	JDB

<b>Water (216024)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	12	mg/L	0.219	1	EPA 300.0	05/17/2018 6:24		GB
Fluoride	0.783	mg/L	0.083	1	EPA 300.0	05/17/2018 6:24	J	GB
Solids, Total Dissolved (TDS)	728	mg/L	2	1	SM 2540 C-2011	05/08/2018 14:00		JTD
Sulfate	214	mg/L	0.140	1:10	EPA 300.0	05/17/2018 7:58		GB



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<b>Report ID</b> : 37591	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/03/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216025	<b>Collected Date:</b> 05/02/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216025)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	0.00419	mg/L	0.00093	1	EPA 6010B 1996	05/31/2018 5:33	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Barium	< 0.00015	mg/L	0.00015	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Boron	0.05525	mg/L	0.00028	1	EPA 6010B 1996	05/31/2018 5:33		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Calcium	< 0.0096	mg/L	0.0096	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Cobalt	< 0.00014	mg/L	0.00014	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Lithium	< 0.00013	mg/L	0.00013	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	05/17/2018 14:34	U	LNLM
Molybdenum	0.00055	mg/L	0.00029	1	EPA 6010B 1996	05/31/2018 5:33	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB
Thallium	< 0.00086	mg/L	0.00086	1	EPA 6010B 1996	05/31/2018 5:33	U	JDB

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## Analysis Report

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**Phone: (318) 673-3802**  
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**Report ID** : 37591  
**Date Received:** 05/03/2018

**Company:** SEP - Environmental (JP-W)  
**Contact:** Jill Parker-Witt  
**Phone:** (318) 673-3816

**Address:** 502 N. Allen Avenue  
 Shreveport, LA 71101  
**Fax:** (318) 673-3960

### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
5/31/2018	Antimony	216019.2	0.005019	0.8	0.8273685	103.4	0.8	0.8112554	101.4		0.2	JDB
5/31/2018	Antimony	216009.1	0.004033	0.8	0.8267759	103.3	0.8	0.7874176	98.4		0.1	JDB
5/31/2018	Antimony	215157.1	0.004033	0.8	0.8267759	103.3	0.8	0.8258387	103.2		0.4	JDB
5/31/2018	Arsenic	216019.2	<0.00105	0.8	0.8200254	102.5	0.8	0.8072418	100.9		0.2	JDB
5/31/2018	Arsenic	216009.1	0.001417	0.8	0.8260430	103.3	0.8	0.7852755	98.2		0.6	JDB
5/31/2018	Arsenic	215157.1	0.001417	0.8	0.8260430	103.3	0.8	0.8173489	102.2		0.9	JDB
5/31/2018	Barium	215157.1	<0.00015	0.2	0.2125247	106.3	0.2	0.2033549	101.7		0.6	JDB
5/31/2018	Barium	216019.2	<0.00015	0.2	0.2102812	105.1	0.2	0.1997377	99.9		0.1	JDB
5/31/2018	Barium	216009.1	<0.00015	0.2	0.2125247	106.3	0.2	0.1943424	97.2		1.6	JDB
5/31/2018	Beryllium	216019.2	<0.00002	0.2	0.2060517	103.0	0.2	0.2050819	102.5		0.5	JDB
5/31/2018	Beryllium	216009.1	<0.00002	0.2	0.2085850	104.3	0.2	0.2006993	100.3		0.3	JDB
5/31/2018	Beryllium	215157.1	<0.00002	0.2	0.2085850	104.3	0.2	0.2067083	103.4		0.2	JDB
5/30/2018	Boron	215129.1	0.005183	0.3	0.30363	101.2	0.3	0.3087853	102.9		0.3	JDB
5/31/2018	Boron	216019.2	0.044382	0.3	0.2990235	99.7	15	18.631447	124.2		3.9	JDB
5/31/2018	Cadmium	216019.2	<0.00007	0.2	0.2046035	102.3	0.2	0.1975905	98.8		0.3	JDB
5/31/2018	Cadmium	216009.1	<0.00007	0.2	0.2059064	103.0	0.2	0.1951314	97.6		0.4	JDB
5/31/2018	Cadmium	215157.1	<0.00007	0.2	0.2059064	103.0	0.2	0.2041354	102.1		0.5	JDB
5/30/2018	Calcium	216019.2	<0.48	1	1.0248191	102.5	50	59.200167	118.4		0.2	JDB
5/30/2018	Calcium	215129.1	0.052046	1	0.96387	96.4	1	0.93694	93.7		1.3	JDB
5/16/2018	Chloride			20	18.1	90.5						GB
5/16/2018	Chloride	216024	<0.219	20	18.3	91.5	50	66	132.0		0.0	GB
5/16/2018	Chloride		<0.219									GB
5/17/2018	Chloride		<0.219									GB
5/17/2018	Chloride	216024	<0.219	20	18.3	91.5	50	66	132.0		0.0	GB
5/17/2018	Chloride			20	18.1	90.5						GB
5/31/2018	Chromium	216019.2	<0.00023	0.4	0.4052233	101.3	0.4	0.4002418	100.1		0.6	JDB
5/31/2018	Chromium	216009.1	<0.00023	0.4	0.4088557	102.2	0.4	0.3885853	97.1		0.2	JDB
5/31/2018	Chromium	215157.1	<0.00023	0.4	0.4088557	102.2	0.4	0.4045946	101.1		0.1	JDB
5/31/2018	Cobalt	215157.1	<0.00014	0.2	0.2044290	102.2	0.2	0.2020274	101.0		0.0	JDB
5/31/2018	Cobalt	216009.1	<0.00014	0.2	0.2044290	102.2	0.2	0.192514	96.3		0.4	JDB
5/31/2018	Cobalt	216019.2	<0.00014	0.2	0.202216	101.1	0.2	0.198529	99.3		0.9	JDB
5/16/2018	Fluoride	216024	<0.083	10	11	110.0	20	25.92	129.6		0.0	GB

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5/16/2018	Fluoride		<0.083									GB
5/16/2018	Fluoride			10	11	110.0						GB
5/17/2018	Fluoride			10	11	110.0						GB
5/17/2018	Fluoride		<0.083									GB
5/17/2018	Fluoride	216024	<0.083	10	11	110.0	20	25.92	129.6		0.0	GB
5/31/2018	Lead	216009.1	<0.00068	1	1.0164545	101.6	1	0.9594413	95.9		0.3	JDB
5/31/2018	Lead	215157.1	<0.00068	1	1.0164545	101.6	1	1.0046001	100.5		0.2	JDB
5/31/2018	Lead	216019.2	<0.00068	1	1.0087892	100.9	1	0.9835240	98.4		0.3	JDB
5/31/2018	Lithium	216019.2	<0.00013	0.2	0.2062583	103.1	0.2	0.215069	107.5		0.4	JDB
5/31/2018	Lithium	216009.1	<0.00013	0.2	0.2059778	103.0	0.2	0.2166713	108.3		0.5	JDB
5/31/2018	Lithium	215157.1	<0.00013	0.2	0.2059778	103.0	0.2	0.2089146	104.5		0.3	JDB
5/17/2018	Mercury	216018.2	<0.00000	0.001	0.0008679	86.8	0.001	0.0009932	99.3		4.5	LNM
5/17/2018	Mercury	216008.1	<0.00000	0.001	0.00099	99.0	0.001	0.0009596	96.0		2.6	LNM
5/31/2018	Molybdenum	216019.2	0.000525	0.2	0.2015659	100.8	0.2	0.2012397	100.6		0.1	JDB
5/31/2018	Molybdenum	215157.1	0.000361	0.2	0.2031598	101.6	0.2	0.2014463	100.7		0.2	JDB
5/31/2018	Molybdenum	216009.1	0.000361	0.2	0.2031598	101.6	0.2	0.195156	97.6		0.3	JDB
5/31/2018	Selenium	216009.1	0.001072	2	2.0125011	100.6	2	1.9585120	97.9		0.3	JDB
5/31/2018	Selenium	215157.1	0.001072	2	2.0125011	100.6	2	2.0058802	100.3		0.8	JDB
5/31/2018	Selenium	216019.2	0.001851	2	2.0135684	100.7	2	1.9745820	98.7		0.2	JDB
5/7/2018	Solids, Total Dissolved (TDS)	216021	<2	101.67	106	104.3	2214	2178	98.4		1.7	LBH
5/8/2018	Solids, Total Dissolved (TDS)	216023	<2	101.67	106	104.3	2140	2124	99.3		0.8	JTD
5/17/2018	Sulfate		<0.140									GB
5/17/2018	Sulfate	216024	<0.140	20	18	90.0	50	46	92.0		8.4	GB
5/17/2018	Sulfate			20	18	90.0						GB
5/31/2018	Thallium	215157.1	0.001182	0.4	0.4102024	102.6	0.4	0.4039268	101.0		0.7	JDB
5/31/2018	Thallium	216019.2	0.000868	0.4	0.4064212	101.6	0.4	0.3913926	97.8		0.1	JDB
5/31/2018	Thallium	216009.1	0.001182	0.4	0.4102024	102.6	0.4	0.3745872	93.6		0.2	JDB

**Code Code Description**

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- U Analyte concentration below MDL.

*Sandra D. Wallace*  
 Laboratory Manager

12-Jul-18  
 Report Date

**Shreveport Chemical Laboratory (SCL)**

502 N. Allen Ave.  
Shreveport, LA 71101

Contacts: Jonathan Barnhill (318-673-3803)  
John Davis (318-673-3811)

**Chain of Custody Record**

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

COC/Order #:

For Lab Use Only:

PT 5.4.18

Analysis Turnaround Time (in Calendar Days)  
Routine (28 days for Monitoring Wells)

Project Name: Northeastern PP CCR  
Contact Name: Jill Parker-Witt  
Contact Phone: 318-673-3816  
Sampler(s): Kenneth McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes				Sample Specific Notes
							B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, TL	Field-filter 500 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10h+) L bottles, pH<2, HNO3	
MW-2D	5/2/2018	1035	G	GW	2	X	X	X	X	216017.1 - 216017.2	
MW-3D	5/2/2018	940	G	GW	2	X	X	X	X	216018.1 - 216018.2	
MW-4D	5/2/2018	920	G	GW	2	X	X	X	X	216019.1 - 216019.2	
MW-5D	5/2/2018	1105	G	GW	2	X	X	X	X	216020.1 - 216020.2	
MW-6D	5/2/2018	1010	G	GW	2	X	X	X	X	216021.1 - 216021.2	
MW-12D	5/2/2018	1140	G	GW	2	X	X	X	X	216022.1 - 216022.2	
MW-13D	5/2/2018	1130	G	GW	2	X	X	X	X	216023.1 - 216023.2	
DUP	5/2/2018	940	G	GW	2	X	X	X	X	216024.1 - 216024.2	
EQUIPMENT BLANK	5/2/2018	1215	G	W	1	X				216025	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field

\* 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:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
 Shreveport, LA 71101  
 Phone 318-673-3802  
 FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Parker  
 Received By JTO  
 Received Date 5/3/18  
 Open Date 5/3/18

Sample Matrix  
 DGA    PCB Oil     Water    Oil    Soil  
 Solid    Liquid    Other \_\_\_\_\_

Container Temp    Read 2  
Thermometer Serial #F04103  
 Correction Factor + 1.2  
 Corrected Temp 3.2

Project I.D. 37591

Were samples received on ice?  YES    NO

Did container arrive in good condition?  YES    NO

Was sample documentation received?  YES    NO

Was documentation filled out properly?  YES    NO

Were samples labeled properly?  YES    NO

Were correct containers used?  YES    NO

Were the pH's of samples appropriately checked?  YES    NO

Total number of sample containers 17

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216844	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-1D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216844)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	0.00457	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 8:08	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 8:08	U	JDB
Barium	0.0181	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 8:08		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 8:08	U	JDB
Boron	1.2	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 8:08		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 8:08	U	JDB
Calcium	135	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 22:11		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 8:08	U	JDB
Cobalt	0.00036	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 8:08	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 8:08	U	JDB
Lithium	0.05481	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 8:08		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:19	U	LNM
Molybdenum	0.01073	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 8:08		JDB
Selenium	0.00311	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 8:08	J	JDB
Thallium	0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 22:11		JDB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216845	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-2D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216845)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	0.00195	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 8:13	J	JDB
Arsenic	0.03461	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 8:13		JDB
Barium	0.02917	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 8:13		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 8:13	U	JDB
Boron	10.1	mg/L	0.014	1:50	EPA 6010B 1996	07/10/2018 22:27		JDB
Cadmium	0.00044	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 8:13	J	JDB
Calcium	19.2	mg/L	0.0096	1	EPA 6010B 1996	07/11/2018 8:13		JDB
Chromium	0.0014	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 8:13		JDB
Cobalt	0.0003	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 8:13	J	JDB
Lead	0.00128	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 8:13	J	JDB
Lithium	0.00125	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 8:13		JDB
Mercury	0.00004	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:22		LNLM
Molybdenum	0.552	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 8:13		JDB
Selenium	0.07231	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 8:13		JDB
Thallium	0.002	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 22:27		JDB

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# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 216846	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-3D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216846)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 8:23	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 8:23	U	JDB
Barium	0.281	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 8:23		JDB
Beryllium	0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 8:23	J	JDB
Boron	0.952	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 8:23		JDB
Cadmium	0.00023	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 8:23	J	JDB
Calcium	129	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 22:33		JDB
Chromium	0.00264	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 8:23		JDB
Cobalt	0.00102	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 8:23	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 8:23	U	JDB
Lithium	0.01673	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 8:23		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:25	U	LNM
Molybdenum	0.00255	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 8:23	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 8:23	U	JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 22:33	U	JDB

<b>Water (216846)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	13	mg/L	0.219	1	EPA 300.0	06/06/2018 10:43		GB
Fluoride	0.896	mg/L	0.083	1	EPA 300.0	06/06/2018 10:43	J	GB
Solids, Total Dissolved (TDS)	724	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	214	mg/L	0.140	1:10	EPA 300.0	06/06/2018 12:18		GB

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## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216847	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216847)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 8:28	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 8:28	U	JDB
Barium	0.173	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 8:28		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 8:28	U	JDB
Boron	1.27	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 8:28		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 8:28	U	JDB
Calcium	164	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 22:38		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 8:28	U	JDB
Cobalt	0.00128	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 8:28	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 8:28	U	JDB
Lithium	0.0033	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 8:28		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:27	U	LNM
Molybdenum	0.00491	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 8:28	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 8:28	U	JDB
Thallium	0.00294	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 8:28		JDB

<b>Water (216847)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	20	mg/L	0.219	1	EPA 300.0	06/06/2018 13:33		GB
Fluoride	0.4188	mg/L	0.083	1	EPA 300.0	06/06/2018 13:33	J	GB
Solids, Total Dissolved (TDS)	910	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	279	mg/L	0.140	1:10	EPA 300.0	06/06/2018 13:52		GB





# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 216848	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216848)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 8:34	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 8:34	U	JDB
Barium	0.139	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 8:34		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 8:34	U	JDB
Boron	0.468	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 8:34		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 8:34	U	JDB
Calcium	136	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 22:43		JDB
Chromium	0.00153	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 8:34		JDB
Cobalt	0.00131	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 8:34	J	JDB
Lead	0.00109	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 8:34	J	JDB
Lithium	0.01199	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 8:34		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:36	U	LNM
Molybdenum	< 0.00029	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 8:34	U	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 8:34	U	JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 22:43	U	JDB

<b>Water (216848)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24	mg/L	0.219	1	EPA 300.0	06/06/2018 14:11		GB
Fluoride	0.711	mg/L	0.083	1	EPA 300.0	06/06/2018 14:11	J	GB
Solids, Total Dissolved (TDS)	628	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	113	mg/L	0.140	1:10	EPA 300.0	06/06/2018 14:29		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216849	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-6D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216849)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 8:39	U	JDB
Arsenic	0.00127	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 8:39	J	JDB
Barium	0.148	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 8:39		JDB
Beryllium	0.00029	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 8:39	J	JDB
Boron	3.35	mg/L	0.014	1:50	EPA 6010B 1996	07/10/2018 22:49		JDB
Cadmium	0.00057	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 8:39	J	JDB
Calcium	269	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 22:49	M4	JDB
Chromium	0.01265	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 8:39		JDB
Cobalt	0.00449	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 8:39	J	JDB
Lead	0.00644	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 8:39		JDB
Lithium	0.02463	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 8:39		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:52	U	LNM
Molybdenum	0.07477	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 8:39		JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 8:39	U	JDB
Thallium	0.024	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 22:49		JDB

<b>Water (216849)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	32	mg/L	0.219	1	EPA 300.0	06/06/2018 14:48		GB
Fluoride	0.9218	mg/L	0.083	1	EPA 300.0	06/06/2018 11:48	J	GB
Solids, Total Dissolved (TDS)	1090	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	401	mg/L	0.140	1:10	EPA 300.0	06/06/2018 15:07		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 216850	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-7D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216850)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.0041	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 9:17	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 9:17	U	JDB
Barium	0.03081	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 9:17		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 9:17	U	JDB
Boron	0.84	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 9:17		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 9:17	U	JDB
Calcium	207	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 22:54		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 9:17	U	JDB
Cobalt	0.00056	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 9:17	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 9:17	U	JDB
Lithium	0.173	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 9:17		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:55	U	LNM
Molybdenum	0.01325	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 9:17		JDB
Selenium	0.00226	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 9:17	J	JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 22:54	U	JDB

<b>Water (216850)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	511	mg/L	0.219	1:10	EPA 300.0	06/06/2018 15:45		GB
Fluoride	3.456	mg/L	0.083	1	EPA 300.0	06/06/2018 15:26		GB
Solids, Total Dissolved (TDS)	5912	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	2973	mg/L	0.140	1:100	EPA 300.0	06/25/2018 14:52		GB

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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
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<b>AEP Sample ID</b> : 216851	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-8D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216851)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.00283	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 9:22	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 9:22	U	JDB
Barium	4.11	mg/L	0.0075	1:50	EPA 6010B 1996	07/10/2018 22:59		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 9:22	U	JDB
Boron	1.31	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 9:22		JDB
Cadmium	0.00105	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 9:22		JDB
Calcium	353	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 22:59		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 9:22	U	JDB
Cobalt	0.00206	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 9:22	J	JDB
Lead	0.00087	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 9:22	J	JDB
Lithium	1.09	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 9:22		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 11:57	U	LNM
Molybdenum	0.00032	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 9:22	J	JDB
Selenium	0.00196	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 9:22	J	JDB
Thallium	0.025	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 22:59		JDB

<b>Water (216851)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	11942	mg/L	0.219	1:100	EPA 300.0	06/06/2018 17:38		GB
Fluoride	3.314	mg/L	0.083	1:10	EPA 300.0	06/06/2018 17:19		GB
Solids, Total Dissolved (TDS)	384	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	47	mg/L	0.140	1	EPA 300.0	06/06/2018 16:04		GB



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<b>AEP Sample ID</b> : 216852	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-10D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216852)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	0.00247	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 9:27	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 9:27	U	JDB
Barium	0.102	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 9:27		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 9:27	U	JDB
Boron	1.15	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 9:27		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 9:27	U	JDB
Calcium	54.9	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:05		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 9:27	U	JDB
Cobalt	0.00061	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 9:27	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 9:27	U	JDB
Lithium	0.451	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 9:27		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:00	U	LNLM
Molybdenum	0.01972	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 9:27		JDB
Selenium	0.00702	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 9:27		JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 23:05	U	JDB

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<b>AEP Sample ID</b> : 216853	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-11D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216853)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 9:44	U	JDB
Arsenic	0.00177	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 9:44	J	JDB
Barium	0.05576	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 9:44		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 9:44	U	JDB
Boron	0.641	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 9:44		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 9:44	U	JDB
Calcium	114	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:10		JDB
Chromium	0.0021	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 9:44		JDB
Cobalt	0.00043	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 9:44	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 9:44	U	JDB
Lithium	0.03979	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 9:44		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:08	U	LNM
Molybdenum	0.01214	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 9:44		JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 9:44	U	JDB
Thallium	0.0018	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 9:44	J	JDB

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## Analysis Report

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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
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<b>AEP Sample ID</b> : 216854	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216854)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 9:49	U	JDB
Arsenic	0.00124	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 9:49	J	JDB
Barium	0.07775	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 9:49		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 9:49	U	JDB
Boron	8.35	mg/L	0.014	1:50	EPA 6010B 1996	07/10/2018 23:16		JDB
Cadmium	0.00025	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 9:49	J	JDB
Calcium	89.9	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:16		JDB
Chromium	0.00274	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 9:49		JDB
Cobalt	0.00149	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 9:49	J	JDB
Lead	0.00304	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 9:49	J	JDB
Lithium	0.00608	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 9:49		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:11	U	LNM
Molybdenum	0.667	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 9:49		JDB
Selenium	0.00388	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 9:49	J	JDB
Thallium	0.0022	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 9:49		JDB

<b>Water (216854)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	91	mg/L	0.219	1	EPA 300.0	06/06/2018 17:57		GB
Fluoride	2.379	mg/L	0.083	1	EPA 300.0	06/06/2018 17:57		GB
Solids, Total Dissolved (TDS)	1088	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	542	mg/L	0.140	1:10	EPA 300.0	06/06/2018 18:34		GB



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<b>AEP Sample ID</b> : 216855	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-13D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216855)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 9:55	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 9:55	U	JDB
Barium	0.07607	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 9:55		JDB
Beryllium	0.00003	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 9:55	J	JDB
Boron	0.864	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 9:55		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 9:55	U	JDB
Calcium	171	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:32		JDB
Chromium	0.00148	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 9:55		JDB
Cobalt	0.00437	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 9:55	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 9:55	U	JDB
Lithium	0.03287	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 9:55		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:14	U	LNM
Molybdenum	0.01307	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 9:55		JDB
Selenium	0.01196	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 9:55		JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 23:32	U	JDB

<b>Water (216855)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	6	mg/L	0.219	1	EPA 300.0	06/06/2018 19:12		GB
Fluoride	0.4361	mg/L	0.083	1	EPA 300.0	06/06/2018 19:12	J	GB
Solids, Total Dissolved (TDS)	1068	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	343	mg/L	0.140	1:10	EPA 300.0	06/06/2018 19:49		GB





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<b>AEP Sample ID</b> : 216856	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-14	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216856)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 10:00	J	JDB
Arsenic	0.00115	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 10:00	J	JDB
Barium	0.157	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 10:00		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 10:00	U	JDB
Boron	1.47	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 10:00		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 10:00	U	JDB
Calcium	77.1	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:37		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 10:00	U	JDB
Cobalt	0.00329	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 10:00	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 10:00	U	JDB
Lithium	0.361	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 10:00		JDB
Mercury	0.000009	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:16	J	LNM
Molybdenum	0.02067	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 10:00		JDB
Selenium	0.00551	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 10:00		JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 23:37	U	JDB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216857	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-15	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216857)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 10:05	U	JDB
Arsenic	0.0039	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 10:05	J	JDB
Barium	0.256	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 10:05		JDB
Beryllium	0.00125	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 10:05		JDB
Boron	8.76	mg/L	0.014	1:50	EPA 6010B 1996	07/10/2018 23:42		JDB
Cadmium	0.00038	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 10:05	J	JDB
Calcium	105	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:42		JDB
Chromium	0.00661	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 10:05		JDB
Cobalt	0.00261	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 10:05	J	JDB
Lead	0.00518	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 10:05		JDB
Lithium	0.01161	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 10:05		JDB
Mercury	0.000024	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:25	J	LNM
Molybdenum	0.551	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 10:05		JDB
Selenium	0.00537	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 10:05		JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 23:42	U	JDB

<b>Water (216857)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	33	mg/L	0.219	1	EPA 300.0	06/06/2018 20:27		GB
Fluoride	2.331	mg/L	0.083	1	EPA 300.0	06/06/2018 20:27		GB
Solids, Total Dissolved (TDS)	1128	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	549	mg/L	0.140	1:10	EPA 300.0	06/06/2018 21:05		GB



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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 216858	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-17	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216858)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	0.00161	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 10:21	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 10:21	U	JDB
Barium	0.04012	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 10:21		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 10:21	U	JDB
Boron	0.702	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 10:21		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 10:21	U	JDB
Calcium	191	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:48		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 10:21	U	JDB
Cobalt	0.00031	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 10:21	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 10:21	U	JDB
Lithium	0.01139	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 10:21		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:33	U	LNLM
Molybdenum	0.00838	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 10:21		JDB
Selenium	0.0267	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 10:21		JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/10/2018 23:48	U	JDB

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## Analysis Report

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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
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<b>AEP Sample ID</b> : 216859	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Duplicate Landfill	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216859)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 10:27	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 10:27	U	JDB
Barium	0.178	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 10:27		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 10:27	U	JDB
Boron	1.26	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 10:27		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 10:27	U	JDB
Calcium	161	mg/L	0.48	1:50	EPA 6010B 1996	07/10/2018 23:53	M4	JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 10:27	U	JDB
Cobalt	0.0011	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 10:27	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 10:27	U	JDB
Lithium	0.00334	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 10:27		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:49	U	LNM
Molybdenum	0.00483	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 10:27	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 10:27	U	JDB
Thallium	0.00289	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 10:27		JDB

<b>Water (216859)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	21	mg/L	0.219	1	EPA 300.0	06/06/2018 21:42	M6	GB
Fluoride	0.411	mg/L	0.083	1	EPA 300.0	06/06/2018 21:42	J	GB
Solids, Total Dissolved (TDS)	916	mg/L	2	1	SM 2540 C-2011	06/06/2018 9:00		LBH
Sulfate	292	mg/L	0.140	1:10	EPA 300.0	06/25/2018 15:30		GB



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<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
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<b>AEP Sample ID</b> : 216860	<b>Collected Date:</b> 05/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank Landfill	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (216860)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	0.00115	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 10:54	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Barium	< 0.00015	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Boron	0.05404	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 10:54		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Calcium	0.0106	mg/L	0.0096	1	EPA 6010B 1996	07/11/2018 10:54		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Cobalt	< 0.00014	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Lithium	< 0.00013	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	06/06/2018 12:52	U	LNLM
Molybdenum	< 0.00029	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB
Selenium	0.00193	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 10:54	J	JDB
Thallium	< 0.00086	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 10:54	U	JDB



## AEP ANALYTICAL CHEMISTRY SERVICES

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**Report ID** : 37763  
**Date Received:** 06/01/2018

**Company:** SEP - Environmental (JP-W)  
**Contact:** Jill Parker-Witt  
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 Shreveport, LA 71101  
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#### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
7/11/2018	Antimony	216829.1	0.002111	0.8	0.7743853	96.8	0.8	0.7694967	96.2		1.8	JDB
7/11/2018	Antimony	216607.1	0.011666	0.8	0.80691	100.9	0.8	0.770316	96.3		1.2	JDB
7/11/2018	Antimony	216839.1	<0.00093	0.8	0.7840294	98.0	0.8	0.7474474	93.4		0.5	JDB
7/11/2018	Antimony	216849.1	<0.00093	0.8	0.7840294	98.0	0.8	0.7162960	89.5		1.2	JDB
7/11/2018	Antimony	216859.1	<0.00093	0.8	0.7863861	98.3	0.8	0.7762676	97.0		0.2	JDB
7/11/2018	Antimony	217438.1	<0.00093	0.8	0.7863861	98.3	0.8	0.7518081	94.0		1.2	JDB
7/11/2018	Antimony	217448.1	<0.00093	0.8	0.7833788	97.9	0.8	0.7646954	95.6		1.2	JDB
7/11/2018	Arsenic	216859.1	<0.00105	0.8	0.7609157	95.1	0.8	0.7596461	95.0		1.1	JDB
7/11/2018	Arsenic	216607.1	<0.00105	0.8	0.82209	102.8	0.8	0.7777993	97.2		1.9	JDB
7/11/2018	Arsenic	216829.1	<0.00105	0.8	0.782387	97.8	0.8	0.7688641	96.1		2.1	JDB
7/11/2018	Arsenic	217448.1	<0.00105	0.8	0.7674074	95.9	0.8	0.7729410	96.6		0.4	JDB
7/11/2018	Arsenic	216849.1	<0.00105	0.8	0.7814274	97.7	0.8	0.7282816	91.0		0.2	JDB
7/11/2018	Arsenic	217438.1	<0.00105	0.8	0.7609157	95.1	0.8	0.7475921	93.4		1.0	JDB
7/11/2018	Arsenic	216839.1	<0.00105	0.8	0.7814274	97.7	0.8	0.7482348	93.5		0.5	JDB
7/11/2018	Barium	216829.1	<0.00015	0.2	0.1947964	97.4	0.2	0.1845827	92.3		2.2	JDB
7/11/2018	Barium	216607.1	<0.00015	0.2	0.20727	103.6	0.2	0.1924270	96.2		0.3	JDB
7/11/2018	Barium	217448.1	<0.00015	0.2	0.1989253	99.5	0.2	0.185726	92.9		0.7	JDB
7/11/2018	Barium	217438.1	<0.00015	0.2	0.1993587	99.7	0.2	0.174301	87.2		1.0	JDB
7/11/2018	Barium	216859.1	<0.00015	0.2	0.1993587	99.7	0.2	0.18852	94.3		0.9	JDB
7/11/2018	Barium	216849.1	<0.00015	0.2	0.1970746	98.5	0.2	0.1860327	93.0		1.0	JDB
7/11/2018	Barium	216839.1	<0.00015	0.2	0.1970746	98.5	0.2	0.1812223	90.6		0.6	JDB
7/11/2018	Beryllium	216607.1	<0.00002	0.2	0.20674	103.4	0.2	0.1968008	98.4		1.3	JDB
7/11/2018	Beryllium	217448.1	<0.00002	0.2	0.1940919	97.0	0.2	0.1934906	96.7		1.2	JDB
7/11/2018	Beryllium	216829.1	<0.00002	0.2	0.1942471	97.1	0.2	0.1962412	98.1		1.8	JDB
7/11/2018	Beryllium	216839.1	<0.00002	0.2	0.1940796	97.0	0.2	0.1927375	96.4		0.3	JDB
7/11/2018	Beryllium	216849.1	<0.00002	0.2	0.1940796	97.0	0.2	0.1873301	93.7		0.2	JDB
7/11/2018	Beryllium	217438.1	<0.00002	0.2	0.1940843	97.0	0.2	0.1922127	96.1		1.5	JDB
7/11/2018	Beryllium	216859.1	<0.00002	0.2	0.1940843	97.0	0.2	0.1945641	97.3		0.8	JDB
7/10/2018	Boron	216849.1	0.111559	0.3	0.2377648	79.3	0.3	0.2329567	77.7		0.8	JDB
7/11/2018	Boron	217448.1	0.068451	0.3	0.2803750	93.5	0.3	0.2338	77.9		0.1	JDB
7/11/2018	Boron	216859.1	0.044220	0.3	0.2766036	92.2	0.3	0.2715733	90.5		1.1	JDB
7/11/2018	Boron	216597.2	0.002614	0.3	0.29955	99.9	0.3	0.287187	95.7		2.6	JDB

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### Analysis Report

02004  
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Date Received: 06/01/2018		Contact: Jill Parker-Witt			Shreveport, LA 71101							
		Phone: (318) 673-3816			Fax: (318) 673-3960							
7/11/2018	Cadmium	216849.1	<0.00007	0.2	0.1944529	97.2	0.2	0.1806458	90.3		0.3	JDB
7/11/2018	Cadmium	216607.1	<0.00007	0.2	0.20786	103.9	0.2	0.1958449	97.9		1.2	JDB
7/11/2018	Cadmium	216839.1	<0.00007	0.2	0.1944529	97.2	0.2	0.1925503	96.3		0.4	JDB
7/11/2018	Cadmium	216859.1	<0.00007	0.2	0.1929989	96.5	0.2	0.188907	94.5		0.9	JDB
7/11/2018	Cadmium	217438.1	<0.00007	0.2	0.1929989	96.5	0.2	0.1909662	95.5		1.5	JDB
7/11/2018	Cadmium	217448.1	<0.00007	0.2	0.192313	96.2	0.2	0.1923029	96.2		1.2	JDB
7/11/2018	Cadmium	216829.1	<0.00007	0.2	0.1957450	97.9	0.2	0.1938799	96.9		1.9	JDB
7/10/2018	Calcium	216849.1	<0.48	1	0.9410564	94.1					0.3	JDB
7/10/2018	Calcium	216859.1	<0.48	1	0.9037201	90.4					1.1	JDB
7/11/2018	Calcium	217448.1	<0.48	1	0.9132641	91.3					0.4	JDB
7/11/2018	Calcium	216597.2	<0.0096	1	1.01517	101.5	1	0.940655	94.1		2.2	JDB
6/6/2018	Chloride						50	48	96.0		8.3	GB
6/6/2018	Chloride		<0.219									GB
6/6/2018	Chloride	216846		20	18.1	90.5	50	68	136.0		0.0	GB
6/6/2018	Chloride	216859	<0.219	20	18.4	92.0	50	73	146.0		0.0	GB
6/6/2018	Chloride						50	45	90.0		0.0	GB
7/11/2018	Chromium	217448.1	<0.00023	0.4	0.3790240	94.8	0.4	0.3807842	95.2		1.2	JDB
7/11/2018	Chromium	216607.1	<0.00023	0.4	0.40533	101.3	0.4	0.3840149	96.0		1.3	JDB
7/11/2018	Chromium	216829.1	<0.00023	0.4	0.3823525	95.6	0.4	0.3856683	96.4		1.9	JDB
7/11/2018	Chromium	216839.1	<0.00023	0.4	0.3813157	95.3	0.4	0.3769947	94.2		0.4	JDB
7/11/2018	Chromium	216849.1	<0.00023	0.4	0.3813157	95.3	0.4	0.3663764	91.6		0.1	JDB
7/11/2018	Chromium	217438.1	<0.00023	0.4	0.3798332	95.0	0.4	0.3749093	93.7		1.5	JDB
7/11/2018	Chromium	216859.1	<0.00023	0.4	0.3798332	95.0	0.4	0.3793229	94.8		0.8	JDB
7/11/2018	Cobalt	216829.1	<0.00014	0.2	0.1923129	96.2	0.2	0.1914518	95.7		2.1	JDB
7/11/2018	Cobalt	217438.1	<0.00014	0.2	0.1937297	96.9	0.2	0.1871922	93.6		1.3	JDB
7/11/2018	Cobalt	216607.1	<0.00014	0.2	0.20521	102.6	0.2	0.1938551	96.9		1.6	JDB
7/11/2018	Cobalt	217448.1	<0.00014	0.2	0.1928593	96.4	0.2	0.1864234	93.2		1.3	JDB
7/11/2018	Cobalt	216859.1	<0.00014	0.2	0.1937297	96.9	0.2	0.1911424	95.6		0.9	JDB
7/11/2018	Cobalt	216849.1	<0.00014	0.2	0.1930186	96.5	0.2	0.1832919	91.6		0.2	JDB
7/11/2018	Cobalt	216839.1	<0.00014	0.2	0.1930186	96.5	0.2	0.1875445	93.8		0.5	JDB
6/6/2018	Fluoride	216828	<0.083	10	10	100.0	10	10	100.0		9.4	GB
6/6/2018	Fluoride		<0.083									GB
6/6/2018	Fluoride			10	11	110.0						GB
6/6/2018	Fluoride			10	10	100.0						GB
6/6/2018	Fluoride	216846	<0.083	10	11	110.0	10	9.8	98.0		0.0	GB
7/11/2018	Lead	216839.1	<0.00068	1	0.9682329	96.8	1	0.9390272	93.9		0.4	JDB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.



## AEP ANALYTICAL CHEMISTRY SERVICES

### Analysis Report

502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

Report ID : 37763		Company: SEP - Environmental (JP-W)				Address: 502 N. Allen Avenue						
Date Received: 06/01/2018		Contact: Jill Parker-Witt				Shreveport, LA 71101						
		Phone: (318) 673-3816				Fax: (318) 673-3960						
7/11/2018	Lead	216829.1	<0.00068	1	0.9724599	97.2	1	0.9687459	96.9		1.9	JDB
7/11/2018	Lead	216849.1	<0.00068	1	0.9682329	96.8	1	0.9115634	91.2		0.5	JDB
7/11/2018	Lead	216859.1	<0.00068	1	0.9628089	96.3	1	0.9529827	95.3		0.9	JDB
7/11/2018	Lead	217438.1	<0.00068	1	0.9628089	96.3	1	0.9349115	93.5		1.6	JDB
7/11/2018	Lead	217448.1	<0.00068	1	0.9668009	96.7	1	0.947151	94.7		1.1	JDB
7/11/2018	Lead	216607.1	<0.00068	1	1.0379	103.8	1	0.9737756	97.4		1.3	JDB
7/11/2018	Lithium	216849.1	<0.00013	0.2	0.2006665	100.3	0.2	0.20681	103.4		0.4	JDB
7/11/2018	Lithium	216607.1	<0.00013	0.2	0.20529	102.6	0.2	0.2014402	100.7		1.3	JDB
7/11/2018	Lithium	216839.1	<0.00013	0.2	0.2006665	100.3	0.2	0.2114136	105.7		0.1	JDB
7/11/2018	Lithium	216859.1	<0.00013	0.2	0.2031312	101.6	0.2	0.2094512	104.7		0.3	JDB
7/11/2018	Lithium	217438.1	<0.00013	0.2	0.2031312	101.6	0.2	0.2139790	107.0		1.2	JDB
7/11/2018	Lithium	217448.1	<0.00013	0.2	0.2009675	100.5	0.2	0.2102503	105.1		0.3	JDB
7/11/2018	Lithium	216829.1	<0.00013	0.2	0.1975821	98.8	0.2	0.2088078	104.4		1.9	JDB
6/6/2018	Mercury	216858.1	<0.00000	0.001	0.0009016	90.2	0.001	0.0008205	82.1		4.9	LNM
6/6/2018	Mercury	216838.1	<0.00000	0.001	0.00094	94.0	0.001	0.0008853	88.5		0.3	LNM
6/6/2018	Mercury	216848.1	<0.00000	0.001	0.000875	87.5	0.001	0.0008819	88.2		15.3	LNM
6/6/2018	Mercury	216828.1	<0.00000	0.001	0.00094	94.0	0.001	0.0008283	82.8		2.2	LNM
7/11/2018	Molybdenum	216849.1	<0.00029	0.2	0.1905412	95.3	0.2	0.1843829	92.2		0.5	JDB
7/11/2018	Molybdenum	216607.1	<0.00029	0.2	0.20379	101.9	0.2	0.1916946	95.8		1.0	JDB
7/11/2018	Molybdenum	216839.1	<0.00029	0.2	0.1905412	95.3	0.2	0.1867393	93.4		1.2	JDB
7/11/2018	Molybdenum	216859.1	<0.00029	0.2	0.1906861	95.3	0.2	0.1931350	96.6		1.0	JDB
7/11/2018	Molybdenum	217438.1	<0.00029	0.2	0.1906861	95.3	0.2	0.1700057	85.0		1.0	JDB
7/11/2018	Molybdenum	217448.1	<0.00029	0.2	0.1895818	94.8	0.2	0.1953099	97.7		1.0	JDB
7/11/2018	Molybdenum	216829.1	<0.00029	0.2	0.1908355	95.4	0.2	0.1943824	97.2		1.9	JDB
7/11/2018	Selenium	217448.1	<0.00099	2	1.9079876	95.4	2	1.8855788	94.3		1.5	JDB
7/11/2018	Selenium	216607.1	0.001565	2	1.98493	99.2	2	1.8985007	94.9		1.6	JDB
7/11/2018	Selenium	217438.1	<0.00099	2	1.9186359	95.9	2	1.6210683	81.1		4.8	JDB
7/11/2018	Selenium	216829.1	0.001256	2	1.8985201	94.9	2	1.8805748	94.0		1.8	JDB
7/11/2018	Selenium	216839.1	<0.00099	2	1.9077373	95.4	2	1.8568667	92.8		0.2	JDB
7/11/2018	Selenium	216849.1	<0.00099	2	1.9077373	95.4	2	1.8317404	91.6		0.8	JDB
7/11/2018	Selenium	216859.1	<0.00099	2	1.9186359	95.9	2	1.8739280	93.7		0.8	JDB
6/6/2018	Solids, Total Dissolved (TDS)	216859	<2	99.33	106	106.7	2152	2114	98.2		0.7	LBH
6/6/2018	Sulfate		<0.140									GB
6/6/2018	Sulfate			20	18	90.0						GB
6/6/2018	Sulfate	216846		20	18	90.0	50	52	104.0		0.0	GB
6/25/2018	Sulfate			20	17.3	86.5						GB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.





# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 37763	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

6/25/2018	Sulfate		<0.140									GB
6/25/2018	Sulfate	216859		20	17.2	86.0	50	51	102.0		0.3	GB
7/10/2018	Thallium	216607.1	<0.043	0.4	0.41188	103.0	0.4	0.3833643	95.8		0.6	JDB
7/10/2018	Thallium	216829.1	<0.043	0.4	0.385064	96.3	0.4	0.3749285	93.7		1.4	JDB
7/10/2018	Thallium	216849.1	<0.043	0.4	0.3845709	96.1	0.4	0.3579218	89.5		0.1	JDB
7/11/2018	Thallium	216859.1	<0.00086	0.4	0.386014	96.5	0.4	0.3752547	93.8		1.1	JDB
7/11/2018	Thallium	217438.1	<0.00086	0.4	0.386014	96.5	0.4	0.359684	89.9		1.6	JDB
7/11/2018	Thallium	217448.1	<0.043	0.4	0.386145	96.5	0.4	0.3536909	88.4		1.0	JDB
7/11/2018	Thallium	216839.1	<0.00086	0.4	0.3845709	96.1	0.4	0.3594548	89.9		0.1	JDB

**Code    Code Description**

- J    Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- M4    The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The associated blank spike recovery was acceptable.
- M6    Matrix spike recovery was high.
- U    Analyte concentration below MDL.

*Sandra D. Wallace*

Laboratory Manager

13-Jul-18

Report Date

**Shreveport Chemical Laboratory (SCL)**

502 N. Allen Ave.  
Shreveport, LA 71101

Contacts: Jonathan Barnhill (318-673-3803)  
John Davis (318-673-3811)

**Chain of Custody Record**

Program: Coal Combustion Residuals (CCR)

6-1-18  
JAS

Project Name: Northeastern PP CCR		Analysis Turnaround Time (in Calendar Days)		Site Contact:		Date:		COC/Order #:		For Lab Use Only:	
Contact Name: Jill Parker-Witt		Need results by July 18, 2018		500 mL bottle, then HNO3		Field-filter 500 mL bottle, then HNO3		1 L bottle, then Cool, 0-6C		Three (six every 10h) L bottles, pH<2, HNO3	
Contact Phone: 318-673-3816				B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, TL		dissolved Fe and Mn		TDS, F, Cl, SO4		Ra-226, Ra-228	
Sampler(s): Kenneth McDonald				Sampler(s) Initials						COC# 37763	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	500 mL bottle, then HNO3	Field-filter 500 mL bottle, then HNO3	1 L bottle, then Cool, 0-6C	Three (six every 10h) L bottles, pH<2, HNO3	Sample Specific Notes:
MW-1D	5/30/2018	1312	G	GW	1		X				216844
MW-2D	5/30/2018	1342	G	GW	1		X				216845
MW-3D	5/30/2018	1422	G	GW	2		X		X		216846.1 - 216846.2
MW-4D	5/30/2018	1437	G	GW	2		X		X		216847.1 - 216847.2
MW-5D	5/30/2018	1326	G	GW	2		X		X		216848.1 - 216848.2
MW-6D	5/30/2018	1409	G	GW	2		X		X		216849.1 - 216849.2
MW-7D	5/30/2018	1451	G	GW	2		X		X		216850.1 - 216850.2
MW-8D	5/30/2018	1512	G	GW	2		X		X		216851.1 - 216851.2
MW-10D	5/30/2018	1137	G	GW	1		X				216852
MW-11D	5/30/2018	1200	G	GW	1		X				216853
MW-12D	5/30/2018	1223	G	GW	2		X		X		216854.1 - 216854.2
MW-13D	5/30/2018	1242	G	GW	2		X		X		216855.1 - 216855.2

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

\*\*\*\*Need results by July 18, 2018\*\*\*\*

Relinquished by: <i>[Signature]</i>	Company: <i>EA&amp;I</i>	Date/Time: <i>06/01/18 1608</i>	Received by: <i>[Signature]</i>	Date/Time: <i>06/11/18 1009</i>
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>[Signature]</i>	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>[Signature]</i>	Date/Time:

**Shreveport Chemical Laboratory (SCL)**

502 N. Allen Ave.

Shreveport, LA 71101

Contacts: Jonathan Barrhill (318-673-3803)

John Davis (318-673-3811)

**Chain of Custody Record**

**Program: Coal Combustion Residuals (CCR)**

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

Analysis Turnaround Time (in Calendar Days)

Need results by July 18, 2018

*POC # 37763*

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenneth McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	500 mL bottle, pH<2, HNO3	Field-filter 500 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th*) L bottles, pH<2, HNO3	COC/Order #		
												B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, TL	dissolved Fe and Mn
MW-14	5/30/2018	1258	G	GW	1		X				216856		
MW-15	5/30/2018	1357	G	GW	2		X				216857.1 - 216857.2		
MW-17	5/30/2018	1417	G	GW	1		X				216858		
Duplicate Landfill	5/30/2018	1437	G	GW	2		X				216859.1 - 216859.2		
Equipment Blank Landfill	5/30/2018	1549	G	W	1		X				216860		
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field * Six 7L Bottles must be collected for Radium for every 10th sample.													
Special Instructions/QC Requirements & Comments: *****Need results by July 18, 2018*****													
Relinquished by:	<i>KSPM</i>	Company:	<i>CA611</i>	Date/Time:	<i>06/01/18 1008</i>	Received by:		Date/Time:		Received In Laboratory by:	<i>SSM</i>	Date/Time:	<i>06/11/18 1009</i>
Relinquished by:		Company:		Date/Time:		Received by:		Date/Time:		Received In Laboratory by:	<i>Nissr</i>	Date/Time:	



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

<b>Container Type</b> <input checked="" type="checkbox"/> Ice Chest <input type="checkbox"/> Bag <input type="checkbox"/> Action Pak <input type="checkbox"/> PCB Mailer <input type="checkbox"/> Bottle <input type="checkbox"/> Other _____					<b>Delivery Type</b> <input type="checkbox"/> UPS <input type="checkbox"/> FEDEX <input type="checkbox"/> US Mail <input checked="" type="checkbox"/> Walk in <input type="checkbox"/> Shuttle <input type="checkbox"/> Other _____				
Tracking # _____									

Client \_\_\_\_\_  
 Received By NE  
 Received Date 3/11/19  
 Open Date \_\_\_\_\_

**Sample Matrix**  
 DGA     PCB Oil     Water     Oil     Soil  
 Solid     Liquid     Other \_\_\_\_\_

Container Temp    Read 3.5°L  
Thermometer Serial #F04103  
 Correction Factor +1.2°L  
 Corrected Temp 4.7°L

Project I.D. 37763

Were samples received on ice?  YES     NO

Did container arrive in good condition?  YES     NO

Was sample documentation received?  YES     NO

Was documentation filled out properly?  YES     NO

Were samples labeled properly?  YES     NO

Were correct containers used?  YES     NO

Were the pH's of samples appropriately checked?  YES     NO metals pH: 4.2

Total number of sample containers 27

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37913	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/28/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217443	<b>Collected Date:</b> 06/27/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> MW-4D		

<b>Metals (217443)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 12:04	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 12:04	U	JDB
Barium	0.167	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 12:04		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 12:04	U	JDB
Boron	1.16	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 12:04		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 12:04	U	JDB
Calcium	177	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 0:41	U	JDB
Chromium	0.00193	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 12:04		JDB
Cobalt	0.00182	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 12:04	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 12:04	U	JDB
Lithium	0.00491	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 12:04		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 10:37	U	LNM
Molybdenum	0.00464	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 12:04	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 12:04	U	JDB
Thallium	0.00294	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 12:04		JDB

<b>Water (217443)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	20	mg/L	0.219	1	EPA 300.0	07/12/2018 0:04		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	07/12/2018 0:04	U	GB
Solids, Total Dissolved (TDS)	882	mg/L	2	1	SM 2540 C-2011	07/02/2018 15:30		LBH
Sulfate	258	mg/L	0.140	1:10	EPA 300.0	07/12/2018 1:57		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37913 <b>Date Received:</b> 06/28/2018	<b>Company:</b> SEP - Environmental (JP-W) <b>Contact:</b> Jill Parker-Witt <b>Phone:</b> (318) 673-3816	<b>Address:</b> 502 N. Allen Avenue Shreveport, LA 71101 <b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217444 <b>Cust Sample ID:</b> MW-5D <b>Sample Desc.:</b> MW-5D	<b>Collected Date:</b> 06/27/2018 <b>Location:</b> Northeastern PP	<b>By:</b> KM <b>Matrix:</b> Water

<b>Metals (217444)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.0025	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 12:20	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 12:20	U	JDB
Barium	0.126	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 12:20		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 12:20	U	JDB
Boron	0.478	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 12:20		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 12:20	U	JDB
Calcium	134	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 0:47		JDB
Chromium	0.0008	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 12:20	J	JDB
Cobalt	0.00063	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 12:20	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 12:20	U	JDB
Lithium	0.01208	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 12:20		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 10:40	U	LNM
Molybdenum	0.00096	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 12:20	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 12:20	U	JDB
Thallium	0.002	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 12:20		JDB
<b>Water (217444)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	26	mg/L	0.219	1	EPA 300.0	07/12/2018 3:50		GB
Fluoride	0.7487	mg/L	0.083	1	EPA 300.0	07/12/2018 3:50	J	GB
Solids, Total Dissolved (TDS)	658	mg/L	2	1	SM 2540 C-2011	07/02/2018 15:30		LBH
Sulfate	122	mg/L	0.140	1:10	EPA 300.0	07/12/2018 4:28		GB



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## Analysis Report

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<b>Report ID</b> : 37913	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/28/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217445	<b>Collected Date:</b> 06/27/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-10D	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> MW-10D		

Metals (217445)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.00174	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 12:37	J	JDB
Arsenic	0.00159	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 12:37	J	JDB
Barium	0.131	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 12:37		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 12:37	U	JDB
Boron	1.16	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 12:37		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 12:37	U	JDB
Calcium	52.5	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 0:52		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 12:37	U	JDB
Cobalt	0.00101	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 12:37	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 12:37	U	JDB
Lithium	0.461	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 12:37		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 10:43	U	LNM
Molybdenum	0.0162	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 12:37		JDB
Selenium	0.00503	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 12:37		JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/11/2018 0:52	U	JDB

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<b>Report ID</b> : 37913 <b>Date Received:</b> 06/28/2018	<b>Company:</b> SEP - Environmental (JP-W) <b>Contact:</b> Jill Parker-Witt <b>Phone:</b> (318) 673-3816	<b>Address:</b> 502 N. Allen Avenue Shreveport, LA 71101 <b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217446 <b>Cust Sample ID:</b> MW-12D <b>Sample Desc.:</b> MW-12D	<b>Collected Date:</b> 06/27/2018 <b>Location:</b> Northeastern PP	<b>By:</b> KM <b>Matrix:</b> Water

<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 12:42	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 12:42	U	JDB
Barium	0.03618	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 12:42		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 12:42	U	JDB
Boron	8.45	mg/L	0.014	1:50	EPA 6010B 1996	07/11/2018 0:57		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 12:42	U	JDB
Calcium	74.9	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 0:57		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 12:42	U	JDB
Cobalt	0.00039	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 12:42	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 12:42	U	JDB
Lithium	0.00541	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 12:42		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 10:45	U	LNM
Molybdenum	0.666	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 12:42		JDB
Selenium	0.00155	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 12:42	J	JDB
Thallium	0.00199	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 12:42	J	JDB

<b>Water (217446)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Chloride	17	mg/L	0.219	1	EPA 300.0	07/12/2018 5:25		GB
Fluoride	1.988	mg/L	0.083	1	EPA 300.0	07/12/2018 5:25		GB
Solids, Total Dissolved (TDS)	1070	mg/L	2	1	SM 2540 C-2011	07/02/2018 15:30		LBH
Sulfate	586	mg/L	0.140	1:10	EPA 300.0	07/12/2018 6:21		GB

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<b>Report ID</b> : 37913 <b>Date Received:</b> 06/28/2018	<b>Company:</b> SEP - Environmental (JP-W) <b>Contact:</b> Jill Parker-Witt <b>Phone:</b> (318) 673-3816	<b>Address:</b> 502 N. Allen Avenue Shreveport, LA 71101 <b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217447 <b>Cust Sample ID:</b> MW-13D <b>Sample Desc.:</b> MW-13D	<b>Collected Date:</b> 06/27/2018 <b>Location:</b> Northeastern PP	<b>By:</b> KM <b>Matrix:</b> Water

<b>Metals (217447)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 12:48	U	JDB
Arsenic	0.00113	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 12:48	J	JDB
Barium	0.119	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 12:48		JDB
Beryllium	0.00012	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 12:48	J	JDB
Boron	1.35	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 12:48		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 12:48	U	JDB
Calcium	212	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 1:03		JDB
Chromium	0.00374	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 12:48		JDB
Cobalt	0.00496	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 12:48	J	JDB
Lead	0.00184	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 12:48	J	JDB
Lithium	0.02781	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 12:48		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 10:54	U	LNM
Molybdenum	0.02456	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 12:48		JDB
Selenium	0.01011	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 12:48		JDB
Thallium	< 0.043	mg/L	0.043	1:50	EPA 6010B 1996	07/11/2018 1:03	U	JDB

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<b>Report ID</b> : 37913 <b>Date Received:</b> 06/28/2018	<b>Company:</b> SEP - Environmental (JP-W) <b>Contact:</b> Jill Parker-Witt <b>Phone:</b> (318) 673-3816	<b>Address:</b> 502 N. Allen Avenue Shreveport, LA 71101 <b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217448 <b>Cust Sample ID:</b> MW-14 <b>Sample Desc.:</b> MW-14	<b>Collected Date:</b> 06/27/2018 <b>Location:</b> Northeastern PP	<b>By:</b> KM <b>Matrix:</b> Water

Metals (217448)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 12:53	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 12:53	U	JDB
Barium	0.161	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 12:53		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 12:53	U	JDB
Boron	1.56	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 12:53		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 12:53	U	JDB
Calcium	71	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 1:08	M4	JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 12:53	U	JDB
Cobalt	0.00314	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 12:53	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 12:53	U	JDB
Lithium	0.378	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 12:53		JDB
Mercury	0.000006	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 11:10	J	LNM
Molybdenum	0.02016	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 12:53		JDB
Selenium	0.00435	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 12:53	J	JDB
Thallium	0.042	mg/L	0.043	1:50	EPA 6010B 1996	07/11/2018 1:08		JDB

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<b>Report ID</b> : 37913	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/28/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217449	<b>Collected Date:</b> 06/27/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-17	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> MW-17		

Metals (217449)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	0.00257	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 13:31	J	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 13:31	U	JDB
Barium	0.04152	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 13:31		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 13:31	U	JDB
Boron	0.715	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 13:31		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 13:31	U	JDB
Calcium	205	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 1:14		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 13:31	U	JDB
Cobalt	0.00075	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 13:31	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 13:31	U	JDB
Lithium	0.01282	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 13:31		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 11:18	U	LNM
Molybdenum	0.00794	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 13:31		JDB
Selenium	0.01246	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 13:31		JDB
Thallium	0.00163	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 13:31	J	JDB

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Report ID : 37913  
Date Received: 06/28/2018

Company: SEP - Environmental (JP-W)  
Contact: Jill Parker-Witt  
Phone: (318) 673-3816

Address: 502 N. Allen Avenue  
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AEP Sample ID : 217450  
Cust Sample ID: Duplicate  
Sample Desc.: Duplicate

Collected Date: 06/27/2018  
Location: Northeastern PP

By: KM  
Matrix: Water

### Metals (217450)

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 13:36	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 13:36	U	JDB
Barium	0.166	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 13:36		JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 13:36	U	JDB
Boron	1.11	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 13:36		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 13:36	U	JDB
Calcium	170	mg/L	0.48	1:50	EPA 6010B 1996	07/11/2018 1:19		JDB
Chromium	0.00165	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 13:36		JDB
Cobalt	0.00135	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 13:36	J	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 13:36	U	JDB
Lithium	0.00475	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 13:36		JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 11:26	U	LNM
Molybdenum	0.00485	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 13:36	J	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 13:36	U	JDB
Thallium	0.00351	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 13:36		JDB

### Water (217450)

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	20	mg/L	0.219	1	EPA 300.0	07/12/2018 7:36		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	07/12/2018 7:36	U	GB
Solids, Total Dissolved (TDS)	886	mg/L	2	1	SM 2540 C-2011	07/02/2018 15:30		LBH
Sulfate	241	mg/L	0.140	1:110	EPA 300.0	07/12/2018 8:14		GB



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## Analysis Report

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<b>Report ID</b> : 37913	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/28/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 217451	<b>Collected Date:</b> 06/27/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Equipment Blank		

<b>Metals (217451)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	< 0.00093	mg/L	0.00093	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Arsenic	< 0.00105	mg/L	0.00105	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Barium	< 0.00015	mg/L	0.00015	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Beryllium	< 0.00002	mg/L	0.00002	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Boron	0.06304	mg/L	0.00028	1	EPA 6010B 1996	07/11/2018 13:41		JDB
Cadmium	< 0.00007	mg/L	0.00007	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Calcium	0.0106	mg/L	0.0096	1	EPA 6010B 1996	07/11/2018 13:41		JDB
Chromium	< 0.00023	mg/L	0.00023	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Cobalt	< 0.00014	mg/L	0.00014	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Lead	< 0.00068	mg/L	0.00068	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Lithium	< 0.00013	mg/L	0.00013	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	07/06/2018 11:29	U	LNM
Molybdenum	< 0.00029	mg/L	0.00029	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Selenium	< 0.00099	mg/L	0.00099	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB
Thallium	< 0.00086	mg/L	0.00086	1	EPA 6010B 1996	07/11/2018 13:41	U	JDB

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## Analysis Report

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<b>Report ID</b> : 37913	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/28/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
7/11/2018	Antimony	217438.1	<0.00093	0.8	0.7863861	98.3	0.8	0.7518081	94.0		1.2	JDB
7/11/2018	Antimony	216607.1	0.011666	0.8	0.80691	100.9	0.8	0.770316	96.3		1.2	JDB
7/11/2018	Antimony	216829.1	0.002111	0.8	0.7743853	96.8	0.8	0.7694967	96.2		1.8	JDB
7/11/2018	Antimony	216839.1	<0.00093	0.8	0.7840294	98.0	0.8	0.7474474	93.4		0.5	JDB
7/11/2018	Antimony	216859.1	<0.00093	0.8	0.7863861	98.3	0.8	0.7762676	97.0		0.2	JDB
7/11/2018	Antimony	217448.1	<0.00093	0.8	0.7833788	97.9	0.8	0.7646954	95.6		1.2	JDB
7/11/2018	Antimony	216849.1	<0.00093	0.8	0.7840294	98.0	0.8	0.7162960	89.5		1.2	JDB
7/11/2018	Arsenic	216607.1	<0.00105	0.8	0.82209	102.8	0.8	0.7777993	97.2		1.9	JDB
7/11/2018	Arsenic	216829.1	<0.00105	0.8	0.782387	97.8	0.8	0.7688641	96.1		2.1	JDB
7/11/2018	Arsenic	216839.1	<0.00105	0.8	0.7814274	97.7	0.8	0.7482348	93.5		0.5	JDB
7/11/2018	Arsenic	216849.1	<0.00105	0.8	0.7814274	97.7	0.8	0.7282816	91.0		0.2	JDB
7/11/2018	Arsenic	216859.1	<0.00105	0.8	0.7609157	95.1	0.8	0.7596461	95.0		1.1	JDB
7/11/2018	Arsenic	217438.1	<0.00105	0.8	0.7609157	95.1	0.8	0.7475921	93.4		1.0	JDB
7/11/2018	Arsenic	217448.1	<0.00105	0.8	0.7674074	95.9	0.8	0.7729410	96.6		0.4	JDB
7/11/2018	Barium	216849.1	<0.00015	0.2	0.1970746	98.5	0.2	0.1860327	93.0		1.0	JDB
7/11/2018	Barium	217448.1	<0.00015	0.2	0.1989253	99.5	0.2	0.185726	92.9		0.7	JDB
7/11/2018	Barium	216859.1	<0.00015	0.2	0.1993587	99.7	0.2	0.18852	94.3		0.9	JDB
7/11/2018	Barium	217438.1	<0.00015	0.2	0.1993587	99.7	0.2	0.174301	87.2		1.0	JDB
7/11/2018	Barium	216607.1	<0.00015	0.2	0.20727	103.6	0.2	0.1924270	96.2		0.3	JDB
7/11/2018	Barium	216839.1	<0.00015	0.2	0.1970746	98.5	0.2	0.1812223	90.6		0.6	JDB
7/11/2018	Barium	216829.1	<0.00015	0.2	0.1947964	97.4	0.2	0.1845827	92.3		2.2	JDB
7/11/2018	Beryllium	217448.1	<0.00002	0.2	0.1940919	97.0	0.2	0.1934906	96.7		1.2	JDB
7/11/2018	Beryllium	217438.1	<0.00002	0.2	0.1940843	97.0	0.2	0.1922127	96.1		1.5	JDB
7/11/2018	Beryllium	216859.1	<0.00002	0.2	0.1940843	97.0	0.2	0.1945641	97.3		0.8	JDB
7/11/2018	Beryllium	216849.1	<0.00002	0.2	0.1940796	97.0	0.2	0.1873301	93.7		0.2	JDB
7/11/2018	Beryllium	216839.1	<0.00002	0.2	0.1940796	97.0	0.2	0.1927375	96.4		0.3	JDB
7/11/2018	Beryllium	216829.1	<0.00002	0.2	0.1942471	97.1	0.2	0.1962412	98.1		1.8	JDB
7/11/2018	Beryllium	216607.1	<0.00002	0.2	0.20674	103.4	0.2	0.1968008	98.4		1.3	JDB
7/11/2018	Boron	217448.1	0.068451	0.3	0.2803750	93.5	0.3	0.2338	77.9		0.1	JDB
7/11/2018	Boron	216859.1	0.044220	0.3	0.2766036	92.2	0.3	0.2715733	90.5		1.1	JDB
7/11/2018	Boron	216597.2	0.002614	0.3	0.29955	99.9	0.3	0.287187	95.7		2.6	JDB
7/11/2018	Cadmium	216839.1	<0.00007	0.2	0.1944529	97.2	0.2	0.1925503	96.3		0.4	JDB

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# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

**502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960**

<b>Report ID</b> : 37913	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/28/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

7/11/2018	Cadmium	216829.1	<0.00007	0.2	0.1957450	97.9	0.2	0.1938799	96.9		1.9	JDB
7/11/2018	Cadmium	216859.1	<0.00007	0.2	0.1929989	96.5	0.2	0.188907	94.5		0.9	JDB
7/11/2018	Cadmium	217438.1	<0.00007	0.2	0.1929989	96.5	0.2	0.1909662	95.5		1.5	JDB
7/11/2018	Cadmium	217448.1	<0.00007	0.2	0.192313	96.2	0.2	0.1923029	96.2		1.2	JDB
7/11/2018	Cadmium	216607.1	<0.00007	0.2	0.20786	103.9	0.2	0.1958449	97.9		1.2	JDB
7/11/2018	Cadmium	216849.1	<0.00007	0.2	0.1944529	97.2	0.2	0.1806458	90.3		0.3	JDB
7/11/2018	Calcium	217448.1	<0.48	1	0.9132641	91.3					0.4	JDB
7/11/2018	Calcium	216597.2	<0.0096	1	1.01517	101.5	1	0.940655	94.1		2.2	JDB
7/12/2018	Chloride		<0.219									GB
7/12/2018	Chloride			20	19	95.0						GB
7/12/2018	Chloride	217443	<0.219	20	20	100.0	50	52	104.0		0.0	GB
7/11/2018	Chromium	216829.1	<0.00023	0.4	0.3823525	95.6	0.4	0.3856683	96.4		1.9	JDB
7/11/2018	Chromium	217448.1	<0.00023	0.4	0.3790240	94.8	0.4	0.3807842	95.2		1.2	JDB
7/11/2018	Chromium	217438.1	<0.00023	0.4	0.3798332	95.0	0.4	0.3749093	93.7		1.5	JDB
7/11/2018	Chromium	216859.1	<0.00023	0.4	0.3798332	95.0	0.4	0.3793229	94.8		0.8	JDB
7/11/2018	Chromium	216839.1	<0.00023	0.4	0.3813157	95.3	0.4	0.3769947	94.2		0.4	JDB
7/11/2018	Chromium	216607.1	<0.00023	0.4	0.40533	101.3	0.4	0.3840149	96.0		1.3	JDB
7/11/2018	Chromium	216849.1	<0.00023	0.4	0.3813157	95.3	0.4	0.3663764	91.6		0.1	JDB
7/11/2018	Cobalt	216849.1	<0.00014	0.2	0.1930186	96.5	0.2	0.1832919	91.6		0.2	JDB
7/11/2018	Cobalt	217448.1	<0.00014	0.2	0.1928593	96.4	0.2	0.1864234	93.2		1.3	JDB
7/11/2018	Cobalt	217438.1	<0.00014	0.2	0.1937297	96.9	0.2	0.1871922	93.6		1.3	JDB
7/11/2018	Cobalt	216859.1	<0.00014	0.2	0.1937297	96.9	0.2	0.1911424	95.6		0.9	JDB
7/11/2018	Cobalt	216839.1	<0.00014	0.2	0.1930186	96.5	0.2	0.1875445	93.8		0.5	JDB
7/11/2018	Cobalt	216607.1	<0.00014	0.2	0.20521	102.6	0.2	0.1938551	96.9		1.6	JDB
7/11/2018	Cobalt	216829.1	<0.00014	0.2	0.1923129	96.2	0.2	0.1914518	95.7		2.1	JDB
7/12/2018	Fluoride		<0.083									GB
7/12/2018	Fluoride			10	10	100.0						GB
7/12/2018	Fluoride	217443	<0.083	10	10	100.0	10	10	100.0		0.0	GB
7/11/2018	Lead	217438.1	<0.00068	1	0.9628089	96.3	1	0.9349115	93.5		1.6	JDB
7/11/2018	Lead	217448.1	<0.00068	1	0.9668009	96.7	1	0.947151	94.7		1.1	JDB
7/11/2018	Lead	216849.1	<0.00068	1	0.9682329	96.8	1	0.9115634	91.2		0.5	JDB
7/11/2018	Lead	216839.1	<0.00068	1	0.9682329	96.8	1	0.9390272	93.9		0.4	JDB
7/11/2018	Lead	216607.1	<0.00068	1	1.0379	103.8	1	0.9737756	97.4		1.3	JDB
7/11/2018	Lead	216829.1	<0.00068	1	0.9724599	97.2	1	0.9687459	96.9		1.9	JDB
7/11/2018	Lead	216859.1	<0.00068	1	0.9628089	96.3	1	0.9529827	95.3		0.9	JDB
7/11/2018	Lithium	216859.1	<0.00013	0.2	0.2031312	101.6	0.2	0.2094512	104.7		0.3	JDB

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# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004

502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 37913	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 06/28/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

7/11/2018	Lithium	216849.1	<0.00013	0.2	0.2006665	100.3	0.2	0.20681	103.4		0.4	JDB
7/11/2018	Lithium	216839.1	<0.00013	0.2	0.2006665	100.3	0.2	0.2114136	105.7		0.1	JDB
7/11/2018	Lithium	216829.1	<0.00013	0.2	0.1975821	98.8	0.2	0.2088078	104.4		1.9	JDB
7/11/2018	Lithium	216607.1	<0.00013	0.2	0.20529	102.6	0.2	0.2014402	100.7		1.3	JDB
7/11/2018	Lithium	217448.1	<0.00013	0.2	0.2009675	100.5	0.2	0.2102503	105.1		0.3	JDB
7/11/2018	Lithium	217438.1	<0.00013	0.2	0.2031312	101.6	0.2	0.2139790	107.0		1.2	JDB
7/6/2018	Mercury	217437.1	0.000007	0.001	0.001	100.0	0.001	0.0009169	91.7		3.8	LNM
7/6/2018	Mercury	217447.1	<0.00000	0.001	0.0010197	102.0	0.001	0.0010343	103.4		11.7	LNM
7/11/2018	Molybdenum	217448.1	<0.00029	0.2	0.1895818	94.8	0.2	0.1953099	97.7		1.0	JDB
7/11/2018	Molybdenum	216607.1	<0.00029	0.2	0.20379	101.9	0.2	0.1916946	95.8		1.0	JDB
7/11/2018	Molybdenum	216829.1	<0.00029	0.2	0.1908355	95.4	0.2	0.1943824	97.2		1.9	JDB
7/11/2018	Molybdenum	216839.1	<0.00029	0.2	0.1905412	95.3	0.2	0.1867393	93.4		1.2	JDB
7/11/2018	Molybdenum	216849.1	<0.00029	0.2	0.1905412	95.3	0.2	0.1843829	92.2		0.5	JDB
7/11/2018	Molybdenum	217438.1	<0.00029	0.2	0.1906861	95.3	0.2	0.1700057	85.0		1.0	JDB
7/11/2018	Molybdenum	216859.1	<0.00029	0.2	0.1906861	95.3	0.2	0.1931350	96.6		1.0	JDB
7/11/2018	Selenium	216859.1	<0.00099	2	1.9186359	95.9	2	1.8739280	93.7		0.8	JDB
7/11/2018	Selenium	216839.1	<0.00099	2	1.9077373	95.4	2	1.8568667	92.8		0.2	JDB
7/11/2018	Selenium	216849.1	<0.00099	2	1.9077373	95.4	2	1.8317404	91.6		0.8	JDB
7/11/2018	Selenium	216607.1	0.001565	2	1.98493	99.2	2	1.8985007	94.9		1.6	JDB
7/11/2018	Selenium	217438.1	<0.00099	2	1.9186359	95.9	2	1.6210683	81.1		4.8	JDB
7/11/2018	Selenium	217448.1	<0.00099	2	1.9079876	95.4	2	1.8855788	94.3		1.5	JDB
7/11/2018	Selenium	216829.1	0.001256	2	1.8985201	94.9	2	1.8805748	94.0		1.8	JDB
7/2/2018	Solids, Total Dissolved (TDS)	217443	<2	99.33	106	106.7	2834	2754	97.2		2.3	LBH
7/12/2018	Sulfate	217443	<0.00086	20	17.2	86.0	50	54	108.0		0.0	GB
7/12/2018	Sulfate			20	17.2	86.0						GB
7/12/2018	Sulfate		<0.140									GB
7/11/2018	Thallium	217438.1	<0.00086	0.4	0.386014	96.5	0.4	0.359684	89.9		1.6	JDB
7/11/2018	Thallium	216859.1	<0.00086	0.4	0.386014	96.5	0.4	0.3752547	93.8		1.1	JDB
7/11/2018	Thallium	216839.1	<0.00086	0.4	0.3845709	96.1	0.4	0.3594548	89.9		0.1	JDB
7/11/2018	Thallium	217448.1	<0.043	0.4	0.386145	96.5	0.4	0.3536909	88.4		1.0	JDB

### Code Code Description

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- M4 The analysis of the spiked sample required a dilution such that the spike recovery calculation does not provide useful information. The associated blank spike recovery was acceptable.

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**AEP ANALYTICAL CHEMISTRY SERVICES**  
**Analysis Report**


02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

**Report ID** : 37913  
**Date Received:** 06/28/2018

**Company:** SEP - Environmental (JP-W)  
**Contact:** Jill Parker-Witt  
**Phone:** (318) 673-3816

**Address:** 502 N. Allen Avenue  
Shreveport, LA 71101  
**Fax:** (318) 673-3960

U Analyte concentration below MDL.

  
Laboratory Manager

13-Jul-18  
Report Date

### Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

*SD*  
6/28/18

For Lab Use Only:  
COC# 37913

Project Name: Northeastern PP CCR  
Contact Name: Jill Parker-Witt  
Contact Phone: 318-673-3816  
Sampler(s): Kenneth McDonald

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	500 mL bottle, pH<2, HNO3	Field-filter 500 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10h) L bottles, pH<2, HNO3	COC/Order #	
											B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, TL	dissolved Fe and Mn
MW-4D	6/27/2018	1105	G	GW	2		X		X		LAB#	219443
MW-5D	6/27/2018	930	G	GW	2		X		X			219444
MW-10D	6/27/2018	1210	G	GW	1		X					219445
MW-12D	6/27/2018	1315	G	GW	2		X		X			219446
MW-13D	6/27/2018	1335	G	GW	1		X					219447
MW-14	6/27/2018	1410	G	GW	1		X					219448
MW-17	6/27/2018	1020	G	GW	1		X					219449
DUPLICATE	6/27/2018	1105	G	GW	2		X		X			219450
EQUIPMENT BLANK	6/27/2018	1430	G	W	1		X					219451

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: <i>Kym</i>	Company: <i>Encl</i>	Date/Time: <i>06/28/18 1130</i>	Received by: <i>Ken</i>	Date/Time: <i>06/28/18 1130</i>
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Parker-Wilt

Received By STD

Received Date 6/28/18

Open Date \_\_\_\_\_

Sample Matrix

DGA  PCB Oil   Water  Oil  Soil

Solid  Liquid  Other \_\_\_\_\_

Container Temp Read 3 Project I.D. \_\_\_\_\_

Correction Factor +1.2 Thermometer Serial #F04103

Corrected Temp 4.2

Were samples received on ice?  YES  NO

Did container arrive in good condition?  YES  NO

Was sample documentation received?  YES  NO

Was documentation filled out properly?  YES  NO

Were samples labeled properly?  YES  NO

Were correct containers used?  YES  NO

Were the pH's of samples appropriately checked?  YES  NO 6/28/18 STD

Total number of sample containers 13

Was any corrective action taken?  NO

Person Contacted \_\_\_\_\_  
Date & Time \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

### Water Analysis

**Location: Northeastern Station**

**Report Date: 8/14/2018**

#### MW-4D

**Sample Number: 182223-001                      Date Collected: 06/27/2018 11:05                      Date Received: 7/3/2018**

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.72	pCi/L	0.15	0.47	ttp	8/10/2018	SW-846 9320-2014, Rev. 1.0
Radium-226	0.524	pCi/L	0.081	0.084	jls	7/30/2018	SW-846 9315-1986, Rev. 0

The carrier recovery is outside the established range of 30-110%.

#### MW-5D

**Sample Number: 182223-002                      Date Collected: 06/27/2018 09:30                      Date Received: 7/3/2018**

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.99	pCi/L	0.15	0.42	ttp	8/10/2018	SW-846 9320-2014, Rev. 1.0
Radium-226	0.522	pCi/L	0.080	0.086	jls	7/30/2018	SW-846 9315-1986, Rev. 0

The carrier recovery is outside the established range of 30-110%.

#### MW-12D

**Sample Number: 182223-003                      Date Collected: 06/27/2018 13:15                      Date Received: 7/3/2018**

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.05	pCi/L	0.17	0.53	ttp	8/10/2018	SW-846 9320-2014, Rev. 1.0
Radium-226	0.281	pCi/L	0.074	0.12	jls	7/30/2018	SW-846 9315-1986, Rev. 0

*\*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.*

**Michael Ohlinger, Chemist**

Email [msohlinger@aep.com](mailto:msohlinger@aep.com) Tel.

Fax 614-836-4168 Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Michael Ohlinger (614-836-4184)  
 Contacts: Dave Conover (614-836-4219)

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenneth McDonald

Analysis Turnaround Time (in Calendar Days)  
 ☞ Routine (28 days for Monitoring Wells)

Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO3	Three (six every 10h*) 1L bottles, pH<2, HNO3	1 L + 250 mL bottles, Cool, 0-6C	40 mL Glass vial or 250 mL PTFE lined bottle, HCL+, pH<2	Field-filter 250 mL bottle, then pH<2, HNO3	COC/Order #:
6/27/2018	1105	G	GW	6		Be, Cd, Cr, Co, Pb, Mn, Ni, Sb, As, Ba, Bi, Ca, Li, Sr, Mo, Se, TL, and Na, K, Mg, Sr	Ra-226, Ra-228	TDS, F, Cl, SO4, and Br, Alkalinity	Hg	dissolved Fe and	182223
6/27/2018	930	G	GW	3			X				
6/27/2018	1315	G	GW	3			X				

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F = filter in field ; F 4

\* Six 1L Bottles must be collected for Radium for every 10th sample.  
 \*\* HCl must be Trace Metal Grade for Mercury analysis when samples cannot be delivered to the laboratory within 48 hours of sampling.

Special Instructions/QC Requirements & Comments:

Relinquished by: <i>KAM</i>	Date/Time: 06/29/18 1400	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Date/Time:	Received in Laboratory by: <i>NACORIK Lech</i>	Date/Time: 7/3/2018 1445

**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS
				Other _____			
Plant/Customer <u>Northeastern</u>			Number of Plastic Containers: <u>12</u>				
Opened By <u>JWB</u>			Number of Glass Containers: _____				
Date/Time <u>7/3/2018 1440</u>			Number of Mercury Containers: _____				
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A			Initial: _____ on ice / <input checked="" type="radio"/> no ice				
# (IR Gun Ser# <u>170779030</u> Expir. <u>11-06-19</u> ) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y <input type="radio"/> N			Comments _____				
Was Chain of Custody received? <input checked="" type="radio"/> Y <input type="radio"/> N			Comments _____				
Requested turnaround: <u>28 day</u>			If RUSH, who was notified? _____				
pH (15 min)	Cr <sup>6+</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: JWB 7/3/2018

- 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# 182223 Initial & Date & Time : \_\_\_\_\_

Comments: \_\_\_\_\_

Logged by JWB \_\_\_\_\_

Reviewed by MG \_\_\_\_\_

**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.



Dolan Chemical Laboratory (DCL)  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Michael Ohlinger (614-836-4184)  
 Contacts: Dave Conover (614-836-4219)

## Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

	For Lab Use Only:											
Project Name: Northeastern PP CCR			COC/Order #:		182698							
Contact Name: Jill Parker-Witt			Date:									
Contact Phone: 318-673-3816			40 mL Glass vial or 250 mL PTFE lined bottle, HCl **, pH<2									
Sampler(s): Kenneth McDonald			Field-filter 250 mL bottle, then pH<2, HNO3									
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.	Site Contact:	250 mL bottle, pH<2, HNO3	Three (six every 10th*) 1L bottles, pH<2, HNO3	1 L + 250 mL bottles, Cool, 0-6C	40 mL Glass vial or 250 mL PTFE lined bottle, HCl **, pH<2	Field-filter 250 mL bottle, then pH<2, HNO3	COC/Order #:
MW-4D	7/31/2018	910	G	GW	6		B, Ca, Li, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Mo, Se, Tl and Na, K, Mg, Sr	Ra-226, Ra-228	TDS, F, Cl, SO4, and Br, Alkalinity	Hg	dissolved Fe and dissolved Mn	
MW-5D	7/31/2018	830	G	GW	3			X				
MW-12D	7/31/2018	940	G	GW	3			X				
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other * Six 1L Bottles must be collected for Radium for every 10th sample. ** HCl must be Trace Metal Grade for Mercury analysis when samples cannot be delivered to the laboratory within 48 hours of sampling.												
Special Instructions/QC Requirements & Comments:												
Relinquished by: <u>WAM</u> Date/Time: 08/07/18 1400      Received by: <u>Jacari C. Beehl</u> Date/Time: 8/9/2018 1445 Relinquished by:      Date/Time:      Received by:      Date/Time:      Date/Time:      Date/Time:      Date/Time:												





# WATER & WASTE SAMPLE RECEIPT FORM

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS
				Other <u>CCR</u>			
Plant/Customer <u>Northeastern</u>			Number of Plastic Containers: <u>12</u>				
Opened By <u>SM</u>			Number of Glass Containers: _____				
Date/Time <u>8-9-18 2:45</u>			Number of Mercury Containers: _____				
Were all temperatures within 0-6°C? Y / N or <u>N/A</u> Initial: <u>SM</u> on ice / no ice							
# (IR Gun Ser# <u>170779030</u> Expir. <u>11-06-19</u> ) - If No, specify each deviation: _____							
Was container in good condition? <u>Y</u> / N Comments _____							
Was Chain of Custody received? <u>Y</u> / N Comments _____							
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: MSO/jwb 8-9-18

- 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# 182698 Initial & Date & Time : \_\_\_\_\_

Logged by JLB Comments: \_\_\_\_\_

Reviewed by MSO \_\_\_\_\_

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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 38097	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 218133	<b>Collected Date:</b> 07/31/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (218133)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	Q18	mg/L	0.00093	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Arsenic	Q18	mg/L	0.00105	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Barium	Q18	mg/L	0.00015	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Beryllium	Q18	mg/L	0.00002	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Boron	Q18	mg/L	0.00028	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cadmium	Q18	mg/L	0.00007	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Calcium	Q18	mg/L	0.0096	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Chromium	Q18	mg/L	0.00023	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cobalt	Q18	mg/L	0.00014	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lead	Q18	mg/L	0.00068	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lithium	Q18	mg/L	0.00013	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	08/03/2018 10:26	U	LNM
Molybdenum	Q18	mg/L	0.00029	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Selenium	Q18	mg/L	0.00099	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Thallium	Q18	mg/L	0.00086	1	EPA 6010B 1996	08/01/2018 10:04		Q18

<b>Water (218133)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	31	mg/L	0.219	1	EPA 300.0	08/08/2018 13:49		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	08/08/2018 13:49	U	GB
Solids, Total Dissolved (TDS)	856	mg/L	2	1	SM 2540 C-2011	08/03/2018 16:00		LBH
Sulfate	294	mg/L	0.140	1:10	EPA 300.0	08/08/2018 14:45		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 38097	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 218134	<b>Collected Date:</b> 07/31/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (218134)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	Q18	mg/L	0.00093	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Arsenic	Q18	mg/L	0.00105	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Barium	Q18	mg/L	0.00015	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Beryllium	Q18	mg/L	0.00002	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Boron	Q18	mg/L	0.00028	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cadmium	Q18	mg/L	0.00007	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Calcium	Q18	mg/L	0.0096	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Chromium	Q18	mg/L	0.00023	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cobalt	Q18	mg/L	0.00014	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lead	Q18	mg/L	0.00068	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lithium	Q18	mg/L	0.00013	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	08/03/2018 10:34	U	LNM
Molybdenum	Q18	mg/L	0.00029	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Selenium	Q18	mg/L	0.00099	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Thallium	Q18	mg/L	0.00086	1	EPA 6010B 1996	08/01/2018 10:04		Q18

<b>Water (218134)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	30	mg/L	0.219	1	EPA 300.0	08/08/2018 15:23		GB
Fluoride	0.8769	mg/L	0.083	1	EPA 300.0	08/08/2018 15:23	J	GB
Solids, Total Dissolved (TDS)	628	mg/L	2	1	SM 2540 C-2011	08/03/2018 16:00		LBH
Sulfate	662	mg/L	0.140	1:10	EPA 300.0	08/08/2018 17:35		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 38097	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 218135	<b>Collected Date:</b> 07/31/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (218135)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	Q18	mg/L	0.00093	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Arsenic	Q18	mg/L	0.00105	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Barium	Q18	mg/L	0.00015	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Beryllium	Q18	mg/L	0.00002	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Boron	Q18	mg/L	0.00028	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cadmium	Q18	mg/L	0.00007	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Calcium	Q18	mg/L	0.0096	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Chromium	Q18	mg/L	0.00023	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cobalt	Q18	mg/L	0.00014	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lead	Q18	mg/L	0.00068	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lithium	Q18	mg/L	0.00013	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	08/03/2018 10:42	U	LNM
Molybdenum	Q18	mg/L	0.00029	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Selenium	Q18	mg/L	0.00099	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Thallium	Q18	mg/L	0.00086	1	EPA 6010B 1996	08/01/2018 10:04		Q18

<b>Water (218135)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	22	mg/L	0.219	1	EPA 300.0	08/08/2018 16:01		GB
Fluoride	2.6173	mg/L	0.083	1	EPA 300.0	08/08/2018 16:01		GB
Solids, Total Dissolved (TDS)	1034	mg/L	2	1	SM 2540 C-2011	08/03/2018 16:00		LBH
Sulfate	662	mg/L	0.140	1:10	EPA 300.0	08/08/2018 17:35		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 38097	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 218136	<b>Collected Date:</b> 07/31/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-14	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (218136)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	Q18	mg/L	0.00093	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Arsenic	Q18	mg/L	0.00105	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Barium	Q18	mg/L	0.00015	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Beryllium	Q18	mg/L	0.00002	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Boron	Q18	mg/L	0.00028	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cadmium	Q18	mg/L	0.00007	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Calcium	Q18	mg/L	0.0096	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Chromium	Q18	mg/L	0.00023	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cobalt	Q18	mg/L	0.00014	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lead	Q18	mg/L	0.00068	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lithium	Q18	mg/L	0.00013	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Mercury	0.000008	mg/L	0.000005	1	EPA 7470A 1994	08/03/2018 10:45	J	LNM
Molybdenum	Q18	mg/L	0.00029	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Selenium	Q18	mg/L	0.00099	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Thallium	Q18	mg/L	0.00086	1	EPA 6010B 1996	08/01/2018 10:04		Q18

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 38097	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 218137	<b>Collected Date:</b> 07/31/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-17	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (218137)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	Q18	mg/L	0.00093	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Arsenic	Q18	mg/L	0.00105	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Barium	Q18	mg/L	0.00015	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Beryllium	Q18	mg/L	0.00002	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Boron	Q18	mg/L	0.00028	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cadmium	Q18	mg/L	0.00007	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Calcium	Q18	mg/L	0.0096	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Chromium	Q18	mg/L	0.00023	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cobalt	Q18	mg/L	0.00014	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lead	Q18	mg/L	0.00068	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lithium	Q18	mg/L	0.00013	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	08/03/2018 10:48	U	LNM
Molybdenum	Q18	mg/L	0.00029	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Selenium	Q18	mg/L	0.00099	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Thallium	Q18	mg/L	0.00086	1	EPA 6010B 1996	08/01/2018 10:04		Q18

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

**Report ID** : 38097  
**Date Received:** 08/01/2018

**Company:** SEP - Environmental (JP-W)  
**Contact:** Jill Parker-Witt  
**Phone:** (318) 673-3816

**Address:** 502 N. Allen Avenue  
Shreveport, LA 71101  
**Fax:** (318) 673-3960

**AEP Sample ID** : 218138  
**Cust Sample ID:** Duplicate  
**Sample Desc.:** Coal Combustion Residuals (CCR)

**Collected Date:** 07/31/2018  
**Location:** Northeastern P.P.

**By:** KM  
**Matrix:** Water

### Metals (218138)

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Antimony	Q18	mg/L	0.00093	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Arsenic	Q18	mg/L	0.00105	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Barium	Q18	mg/L	0.00015	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Beryllium	Q18	mg/L	0.00002	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Boron	Q18	mg/L	0.00028	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cadmium	Q18	mg/L	0.00007	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Calcium	Q18	mg/L	0.0096	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Chromium	Q18	mg/L	0.00023	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cobalt	Q18	mg/L	0.00014	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lead	Q18	mg/L	0.00068	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lithium	Q18	mg/L	0.00013	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	08/03/2018 10:50	U	LNM
Molybdenum	Q18	mg/L	0.00029	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Selenium	Q18	mg/L	0.00099	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Thallium	Q18	mg/L	0.00086	1	EPA 6010B 1996	08/01/2018 10:04		Q18

### Water (218138)

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	30	mg/L	0.219	1	EPA 300.0	08/08/2018 16:38		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	08/08/2018 16:38	U	GB
Solids, Total Dissolved (TDS)	860	mg/L	2	1	SM 2540 C-2011	08/03/2018 16:00		LBH
Sulfate	292	mg/L	0.140	1:10	EPA 300.0	08/08/2018 17:54		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 38097	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 218139	<b>Collected Date:</b> 07/31/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (218139)</b>								
<b>Parameter</b>	<b>Value</b>	<b>Unit</b>	<b>Det. Limit</b>	<b>Dil./Conc.</b>	<b>Method</b>	<b>Analysis Date/Time</b>	<b>Codes</b>	<b>Tech</b>
Antimony	Q18	mg/L	0.00093	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Arsenic	Q18	mg/L	0.00105	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Barium	Q18	mg/L	0.00015	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Beryllium	Q18	mg/L	0.00002	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Boron	Q18	mg/L	0.00028	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cadmium	Q18	mg/L	0.00007	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Calcium	Q18	mg/L	0.0096	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Chromium	Q18	mg/L	0.00023	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Cobalt	Q18	mg/L	0.00014	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lead	Q18	mg/L	0.00068	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Lithium	Q18	mg/L	0.00013	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	08/03/2018 10:53	U	LNM
Molybdenum	Q18	mg/L	0.00029	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Selenium	Q18	mg/L	0.00099	1	EPA 6010B 1996	08/01/2018 10:04		Q18
Thallium	Q18	mg/L	0.00086	1	EPA 6010B 1996	08/01/2018 10:04		Q18

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.





# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 38097	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/01/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
8/8/2018	Chloride	218155	<0.219	20	20	100.0	20	11	55.0		0.0	GB
8/8/2018	Chloride		<0.219									GB
8/8/2018	Chloride			20	20	100.0						GB
8/8/2018	Fluoride	218155	<0.083	10	11	110.0	10	10	100.0		0.0	GB
8/8/2018	Fluoride		<0.083									GB
8/8/2018	Fluoride			10	11	110.0						GB
8/3/2018	Mercury	218132.1	<0.00000	0.001	0.0008533	85.3	0.001	0.0010354	103.5		10.6	LNM
8/3/2018	Solids, Total Dissolved (TDS)	218133	<2	95.33	102	107.0	2212	2168	98.0		1.9	LBH
8/8/2018	Sulfate	218155	<0.140	20	18	90.0	20	11	55.0		0.0	GB
8/8/2018	Sulfate		<0.140									GB
8/8/2018	Sulfate			20	18	90.0						GB

**Code Code Description**

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- U Analyte concentration below MDL.

*Sandra G. Wallace*  
 \_\_\_\_\_  
 Laboratory Manager

11-Oct-18  
 \_\_\_\_\_  
 Report Date

# Chain of Custody Record

**Shreveport Chemical Laboratory (SCL)**  
 502 N. Allen Ave.  
 Shreveport, LA 71101  
 Jonathan Barnhill (318-673-3803)  
 Contacts: John Davis (318-673-3811)

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

COC/Order #:

For Lab Use Only:

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816

Analysis Turnaround Time (in Calendar Days)  
 Routine (28 days for Monitoring Wells)

QC # 58087

Sampler(s): Kenneth McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials				Sample Specific Notes:
						B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, TL	Field-filter 500 mL bottle, then pH<2, HNO3	1 L bottle, Cool 0-6C	Three (six every 10hr) L bottles, pH<2, HNO3	
MMW-4D	7/31/2018	910	G	GW	2	X		X		218133.1 - 218133.2
MMW-5D	7/31/2018	830	G	GW	2	X		X		218134.1 - 218134.2
MMW-12D	7/31/2018	940	G	GW	2	X		X		218135.1 - 218135.2
MMW-14	7/31/2018	810	G	GW	1	X				218136
MMW-17	7/31/2018	850	G	GW	1	X				218137
DUPLICATE	7/31/2018	910	G	GW	2	X		X		218138.1 - 218138.2
EQUIPMENT BLANK	7/31/2018	1000	G	GW	1	X				218139
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____; F= filter in field						4	F4	1	4	

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: *WATSON* Company: *ENGIE* Date/Time: *08/01/18 1003* Received by: *[Signature]* Date/Time: *8/1/18 10:04*

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

### PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Parker - Witt  
Received By JTD  
Received Date 8/11/18  
Open Date \_\_\_\_\_

Sample Matrix  
 DGA     PCB Oil     Water     Oil     Soil  
 Solid     Liquid    Other \_\_\_\_\_

Container Temp Read 3  
Thermometer Serial #F04103  
Correction Factor +1.2  
Corrected Temp 4.2

Project I.D. 38097

Were samples received on ice?  YES    NO

Did container arrive in good condition?  YES    NO

Was sample documentation received?  YES    NO

Was documentation filled out properly?  YES    NO

Were samples labeled properly?  YES    NO

Were correct containers used?  YES    NO

Were the pH's of samples appropriately checked?  YES    NO

Total number of sample containers 11

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_  
Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sample ID	Analysis	pH	Preservative Added / Lot #
MW-4D	Metals	22	/
MW-5D	↓	↓	/
MW-12D			/
MW-14			/
MW-17			/
Duplicate			/
Equipment Blanks			/
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Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

## Water Analysis

**Location: Northeastern Station**

**Report Date: 10/11/2018**

### MW-4D

**Sample Number: 182919-001**

**Date Collected: 07/31/2018 09:10**

**Date Received: 8/23/2018**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.05	ug/L		0.05	0.01	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.25	ug/L		0.05	0.01	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Barium, Ba	173	ug/L		0.1	0.02	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.01	ug/L	J	0.02	0.004	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Boron, B	1.04	mg/L		0.005	0.001	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.04	ug/L		0.02	0.005	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	196	mg/L		0.02	0.004	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.007	ug/L	U	0.05	0.007	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.521	ug/L		0.02	0.004	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.130	ug/L		0.02	0.004	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00315	mg/L		0.0002	0.00006	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	4.59	ug/L		0.1	0.02	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.2	ug/L		0.1	0.03	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.02	ug/L	J	0.05	0.01	GES	09/26/2018 18:31	EPA 200.8-1994, Rev. 5.4

### MW-5D

**Sample Number: 182919-002**

**Date Collected: 07/31/2018 08:30**

**Date Received: 8/23/2018**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.16	ug/L		0.05	0.01	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.27	ug/L		0.05	0.01	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Barium, Ba	143	ug/L		0.1	0.02	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.103	ug/L		0.02	0.004	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.21	ug/L		0.02	0.005	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.355	ug/L		0.05	0.007	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.482	ug/L		0.02	0.004	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Lead, Pb	1.43	ug/L		0.02	0.004	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	1.21	ug/L		0.1	0.02	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.4	ug/L		0.1	0.03	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.02	ug/L	J	0.05	0.01	GES	09/26/2018 18:36	EPA 200.8-1994, Rev. 5.4
Boron, B	0.491	mg/L		0.005	0.002	DAM	09/20/2018 11:10	EPA 200.7-1994, Rev. 4.4
Calcium, Ca	142	mg/L		0.02	0.005	DAM	09/20/2018 11:10	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.011	mg/L		0.001	0.0002	DAM	09/20/2018 11:10	SW-846 6010C-2007, Rev. 3.0

**MW-12D**

Sample Number: 182919-003

Date Collected: 07/31/2018 09:40

Date Received: 8/23/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.11	ug/L		0.05	0.01	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Arsenic, As	3.00	ug/L		0.05	0.01	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Barium, Ba	42.0	ug/L		0.1	0.02	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.053	ug/L		0.02	0.004	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.07	ug/L		0.02	0.005	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.414	ug/L		0.05	0.007	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.674	ug/L		0.02	0.004	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Lead, Pb	2.32	ug/L		0.02	0.004	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	818	ug/L		0.1	0.02	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Selenium, Se	1.7	ug/L		0.1	0.03	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.106	ug/L		0.05	0.01	GES	09/26/2018 18:41	EPA 200.8-1994, Rev. 5.4
Boron, B	8.72	mg/L		0.005	0.002	DAM	09/20/2018 11:13	EPA 200.7-1994, Rev. 4.4
Calcium, Ca	108	mg/L		0.02	0.005	DAM	09/20/2018 11:13	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.006	mg/L		0.001	0.0002	DAM	09/20/2018 11:13	SW-846 6010C-2007, Rev. 3.0

**MW-14**

Sample Number: 182919-004

Date Collected: 07/31/2018 08:10

Date Received: 8/23/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	1.35	ug/L		0.05	0.01	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.58	ug/L		0.05	0.01	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Barium, Ba	172	ug/L		0.1	0.02	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.029	ug/L		0.02	0.004	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.18	ug/L		0.02	0.005	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.007	ug/L	U	0.05	0.007	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	2.63	ug/L		0.02	0.004	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.037	ug/L		0.02	0.004	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	27.8	ug/L		0.1	0.02	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Selenium, Se	3.5	ug/L		0.1	0.03	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.05	ug/L	J	0.05	0.01	GES	09/26/2018 18:46	EPA 200.8-1994, Rev. 5.4
Boron, B	1.50	mg/L		0.005	0.002	DAM	09/20/2018 11:16	EPA 200.7-1994, Rev. 4.4
Calcium, Ca	68.0	mg/L		0.02	0.005	DAM	09/20/2018 11:16	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.362	mg/L		0.001	0.0002	DAM	09/20/2018 11:16	SW-846 6010C-2007, Rev. 3.0

**MW-17**

Sample Number: 182919-005

Date Collected: 07/31/2018 08:50

Date Received: 8/23/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.28	ug/L		0.05	0.01	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.28	ug/L		0.05	0.01	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Barium, Ba	39.5	ug/L		0.1	0.02	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.005	ug/L	J	0.02	0.004	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.10	ug/L		0.02	0.005	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.007	ug/L	U	0.05	0.007	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	1.84	ug/L		0.02	0.004	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.056	ug/L		0.02	0.004	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	8.66	ug/L		0.1	0.02	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Selenium, Se	5.4	ug/L		0.1	0.03	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.057	ug/L		0.05	0.01	GES	09/26/2018 18:51	EPA 200.8-1994, Rev. 5.4
Boron, B	0.843	mg/L		0.005	0.002	DAM	09/20/2018 11:31	EPA 200.7-1994, Rev. 4.4
Calcium, Ca	234	mg/L		0.02	0.005	DAM	09/20/2018 11:31	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.017	mg/L		0.001	0.0002	DAM	09/20/2018 11:31	SW-846 6010C-2007, Rev. 3.0

**Duplicate**

Sample Number: 182919-006

Date Collected: 07/31/2018 09:10

Date Received: 8/23/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.06	ug/L		0.05	0.01	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.27	ug/L		0.05	0.01	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Barium, Ba	180	ug/L		0.1	0.02	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.02	ug/L	J	0.02	0.004	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.05	ug/L		0.02	0.005	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.03	ug/L	J	0.05	0.007	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.620	ug/L		0.02	0.004	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.206	ug/L		0.02	0.004	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	4.71	ug/L		0.1	0.02	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.2	ug/L		0.1	0.03	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.02	ug/L	J	0.05	0.01	GES	09/26/2018 18:56	EPA 200.8-1994, Rev. 5.4
Boron, B	1.01	mg/L		0.005	0.002	DAM	09/20/2018 11:34	EPA 200.7-1994, Rev. 4.4
Calcium, Ca	163	mg/L		0.02	0.005	DAM	09/20/2018 11:34	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.007	mg/L		0.001	0.0002	DAM	09/20/2018 11:34	SW-846 6010C-2007, Rev. 3.0

Equipment Blank

Sample Number: 182919-007

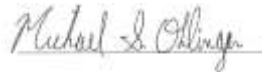
Date Collected: 07/31/2018 10:00

Date Received: 8/23/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.01	ug/L	U	0.05	0.01	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Arsenic, As	< 0.01	ug/L	U	0.05	0.01	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Barium, Ba	0.06	ug/L	J	0.1	0.02	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.004	ug/L	U	0.02	0.004	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.005	ug/L	U	0.02	0.005	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.007	ug/L	U	0.05	0.007	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.01	ug/L	J	0.02	0.004	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.004	ug/L	U	0.02	0.004	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	0.17	ug/L		0.1	0.02	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Selenium, Se	< 0.03	ug/L	U	0.1	0.03	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.01	ug/L	U	0.05	0.01	GES	09/26/2018 19:01	EPA 200.8-1994, Rev. 5.4
Boron, B	0.034	mg/L		0.005	0.002	DAM	09/20/2018 11:38	EPA 200.7-1994, Rev. 4.4
Calcium, Ca	0.029	mg/L		0.02	0.005	DAM	09/20/2018 11:38	EPA 200.7-1994, Rev. 4.4
Lithium, Li	0.002	mg/L		0.001	0.0002	DAM	09/20/2018 11:38	SW-846 6010C-2007, Rev. 3.0

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.



Michael Ohlinger, Chemist

Email msohlinger@aep.com Tel.

Fax 614-836-4168 Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**



# Chain of Custody Record

**Program: Coal Combustion Residuals (CCR)**

<b>Dolan Chemical Laboratory (DCL)</b> 4001 Bixby Road Groveport, Ohio 43125 Michael Ohlinger (614-836-4184) Contacts: Dave Conover (614-836-4219)		For Lab Use Only: COC/Order #: <span style="font-size: large;">182919</span>
Project Name: Northeastern PP CCR		
Contact Name: Jill Parker-Witt		
Contact Phone: 318-673-3816		
Sampler(s): Kenneth McDonald		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Analysis Turnaround Time (in Calendar Days)	Site Contact:	Date:	For Lab Use Only:											
									250 mL bottle, pH<2, HNO3	Three (six every 10th) 1L bottles, pH<2, HNO3	1L + 250 mL bottles	40 mL Glass vial or 250 mL PTFE lined bottle, HCL, pH<2	Field-filter 250 mL bottle, then pH<2, HNO3	COC/Order #	Sample Specific Notes:					
MW-4D	7/31/2018	910	G	GW	1	Analysis Turnaround Time (in Calendar Days)	Sampler(s) Initials													
MW-5D	7/31/2018	830	G	GW	1															
MW-12D	7/31/2018	940	G	GW	1															
MW-14	7/31/2018	810	G	GW	1															
MW-17	7/31/2018	850	G	GW	1															
DUPLICATE	7/31/2018	910	G	GW	1															
EQUIPMENT BLANK	7/31/2018	1000	G	GW	1															

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other \_\_\_\_\_; F = filter in field

\* Six 1L Bottles must be collected for Radium for every 10th sample.

\*\* HCl must be Trace Metal Grade for Mercury analysis when samples cannot be delivered to the laboratory within 48 hours of sampling.

Special Instructions/QC Requirements & Comments:

Relinquished by:	<i>Jonathan Bowditch</i>	Company:	AEP	Date/Time:	8-20-18 0853	Received by:		Date/Time:	
Relinquished by:		Company:		Date/Time:		Received by:		Date/Time:	
Relinquished by:		Company:		Date/Time:		Received in laboratory by:	<i>Michael Ohlinger</i>	Date/Time:	8/23/18 11:35 AM

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Dolan, Rev. 2, 11/02/16

**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>			<u>Delivery Type</u>				
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	PONY	<input checked="" type="radio"/> UPS	<input type="radio"/> FedEx	<input type="radio"/> USPS
			Other _____				
Plant/Customer <u>Shreveport Lab</u>			Number of Plastic Containers: <u>7</u>				
Opened By <u>MSO</u>			Number of Glass Containers: <u>-</u>				
Date/Time <u>8/23/18 8:35AM</u>			Number of Mercury Containers: <u>-</u>				
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: _____ on ice / <input checked="" type="radio"/> no ice							
# (IR Gun Ser# <u>170779038</u> Expir. <u>11-06-19</u> ) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y / N Comments _____							
Was Chain of Custody received? <input checked="" type="radio"/> Y / N Comments _____							
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>6+</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: \_\_\_\_\_

- 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# 182919 Initial & Date & Time : \_\_\_\_\_

Logged by MSO Comments: \_\_\_\_\_

Reviewed by JB \_\_\_\_\_

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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 38260	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/30/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 218925	<b>Collected Date:</b> 08/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (218925)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000007	mg/L	0.000005	1	EPA 7470A 1994	09/14/2018 10:38	J	LNLM
Water (218925)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	29	mg/L	0.219	1	EPA 300.0	10/04/2018 14:23	H1	GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	10/04/2018 14:23	H1,U	GB
Solids, Total Dissolved (TDS)	886	mg/L	2	1	SM 2540 C-2011	09/04/2018 16:15		JTD
Sulfate	267	mg/L	0.140	1:10	EPA 300.0	10/04/2018 14:42	H1	GB

<b>AEP Sample ID</b> : 218926	<b>Collected Date:</b> 08/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (218926)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000006	mg/L	0.000005	1	EPA 7470A 1994	09/14/2018 10:41	J	LNLM
Water (218926)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	30	mg/L	0.219	1	EPA 300.0	10/04/2018 15:01	H1	GB
Fluoride	0.7931	mg/L	0.083	1	EPA 300.0	10/04/2018 15:01	H1,J	GB
Solids, Total Dissolved (TDS)	648	mg/L	2	1	SM 2540 C-2011	09/04/2018 16:15		JTD
Sulfate	130	mg/L	0.140	1:10	EPA 300.0	10/04/2018 15:20	H1	GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 38260	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/30/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 218927	<b>Collected Date:</b> 08/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (218927)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/14/2018 10:49	U	LNM

Water (218927)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	21	mg/L	0.219	1	EPA 300.0	10/04/2018 15:38	H1	GB
Fluoride	2.3093	mg/L	0.083	1	EPA 300.0	10/04/2018 15:38	H1	GB
Solids, Total Dissolved (TDS)	1050	mg/L	2	1	SM 2540 C-2011	09/04/2018 16:15		JTD
Sulfate	590	mg/L	0.140	1:10	EPA 300.0	10/04/2018 15:57	H1	GB

<b>AEP Sample ID</b> : 218928	<b>Collected Date:</b> 08/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-14	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (218928)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/14/2018 11:06	U	LNM

<b>AEP Sample ID</b> : 218929	<b>Collected Date:</b> 08/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Duplicate	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (218929)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/18/2018 9:35	U	LNM

Water (218929)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	30	mg/L	0.219	1	EPA 300.0	10/04/2018 16:16	H1	GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	10/04/2018 16:16	H1,U	GB
Solids, Total Dissolved (TDS)	868	mg/L	2	1	SM 2540 C-2011	09/04/2018 16:15		JTD
Sulfate	265	mg/L	0.140	1:10	EPA 300.0	10/04/2018 16:35	H1	GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 38260	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/30/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 218930	<b>Collected Date:</b> 08/30/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (218930)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/14/2018 11:14	U	LNM

**Quality Control Data**  
 \* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
10/4/2018	Chloride	218987	<0.219	20	23	115.0	20	22	110.0	0.0	GB	
10/4/2018	Chloride		<0.219								GB	
10/4/2018	Fluoride	218897	<0.083	10	10	100.0	10	10	100.0	0.0	GB	
10/4/2018	Fluoride		<0.083								GB	
9/14/2018	Mercury	218927.2	<0.00000	0.001	0.00097	97.0	0.001	0.0009754	97.5	0.5	LNM	
9/14/2018	Mercury	218890.1	<0.00000	0.001	0.0008940	89.4	0.001	0.0010291	102.9	0.6	LNM	
9/18/2018	Mercury	218929.2	<0.00000	0.001	0.00108	108.0	0.001	0.0009299	93.0	2.3	LNM	
9/18/2018	Mercury	218910.2	<0.00000	0.001	0.0008968	89.7	0.001	0.0010450	104.5	12.7	LNM	
9/18/2018	Mercury	218900.1	<0.00000	0.001	0.00108	108.0	0.001	0.0011062	110.6	4.1	LNM	
9/4/2018	Solids, Total Dissolved (TDS)	218926	<2	94	102	108.5	2824	2760	97.7	3.3	JTD	
10/4/2018	Sulfate	218897	<0.140	20	19	95.0	20	20	100.0	0.0	GB	
10/4/2018	Sulfate		<0.140								GB	

**Code Code Description**

- H1 Sample analysis performed past holding time
- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- U Analyte concentration below MDL.

*Sandra G. Wallace*  
 Laboratory Manager

05-Oct-18  
 Report Date

## Chain of Custody Record

**Shreveport Chemical Laboratory (SCL)**  
 502 N. Allen Ave.  
 Shreveport, LA 71101  
 Jonathan Barnhill (318-673-3803)  
 Contacts: John Davis (318-673-3811)

Program: Coal Combustion Residuals (CCR)

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenneth McDonald

Site Contact:

Date:

COC/Order #:

For Lab Use Only:

Analysis Turnaround Time (in Calendar Days)  
 Routine (28 days for Monitoring Wells)

14      9/14/18

COC# 38240

Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes				Sample Specific Notes	
							Mercury	dissolved Fe and Mn	TDS, F, Cl, SO4	Three (six every 10th*) L bottles, pH<2, HNO3		
MMW-4D	8/30/2018	830	G	GW	2		X		X		218925.1 - 218925.2	
MMW-5D	8/30/2018	815	G	GW	2		X		X		218926.1 - 218926.2	
MMW-12D	8/30/2018	845	G	GW	2		X		X		218927.1 - 218927.2	
MMW-14	8/30/2018	800	G	GW	1		X		X		218928	
DUPLICATE	8/30/2018	830	G	GW	2		X				218929.1 - 218929.2	
EQUIPMENT BLANK	8/30/2018	900	G	GW	1		X				218930	
Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH; 6= Other _____; F= filter in field							4	F4	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:	Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Company:	
	CA611	08/30/18 1532										
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Company:	



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

<b>Container Type</b> <input checked="" type="radio"/> Ice Chest <input type="radio"/> Bag <input type="radio"/> Action Pak <input type="radio"/> PCB Mailer <input type="radio"/> Bottle Other _____				<b>Delivery Type</b> <input type="radio"/> UPS <input type="radio"/> FEDEX <input type="radio"/> US Mail <input type="radio"/> Walk in <input checked="" type="radio"/> Shuttle Other _____			
				Tracking # _____			

Client Jill Parker  
 Received By ZS/30/18  
 Received Date UBH  
 Open Date \_\_\_\_\_

**Sample Matrix**  
 DGA     PCB Oil     Water     Oil     Soil  
 Solid     Liquid     Other \_\_\_\_\_

Container Temp    Read 3.0°C  
Thermometer Serial #F04103  
 Correction Factor +1.2  
 Corrected Temp 4.2°C

Project I.D. 38260

Were samples received on ice?  YES     NO

- Did container arrive in good condition?     YES     NO
- Was sample documentation received?     YES     NO
- Was documentation filled out properly?     YES     NO
- Were samples labeled properly?     YES     NO
- Were correct containers used?     YES     NO
- Were the pH's of samples appropriately checked?     YES     NO
- Total number of sample containers    10
- Was any corrective action taken?     NO

Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_







Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

## Water Analysis

**Location: Northeastern Station**

**Report Date: 10/1/2018**

### MW-4D

**Sample Number: 183093-001**

**Date Collected: 08/30/2018 08:30**

**Date Received: 9/5/2018**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.10	ug/L		0.05	0.01	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.60	ug/L		0.05	0.01	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Barium, Ba	163	ug/L		0.1	0.02	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.049	ug/L		0.02	0.004	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.11	ug/L		0.02	0.005	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.551	ug/L		0.05	0.007	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.807	ug/L		0.02	0.004	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.804	ug/L		0.02	0.004	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	4.48	ug/L		0.1	0.02	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.3	ug/L		0.1	0.03	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.02	ug/L	J	0.05	0.01	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Boron, B	1.26	mg/L		0.005	0.001	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	183	mg/L		0.02	0.004	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00296	mg/L		0.0002	0.00006	GES	09/20/2018 02:28	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	0.453	pCi/L	0.19	0.63	jls	9/24/2018	SW-846 9320-2014, Rev. 1.0
The LFBD spike recovery is outside the established range of 75-125%. All other QC associated with this batch is acceptable.							
Radium-226	0.459	pCi/L	0.094	0.14	jls	9/27/2018	SW-846 9315-1986, Rev. 0

The carrier recovery is outside the established range of 30-110%.

**\*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.**

MW-5D

Sample Number: 183093-002

Date Collected: 08/30/2018 08:15

Date Received: 9/5/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.10	ug/L		0.05	0.01	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.98	ug/L		0.05	0.01	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Barium, Ba	111	ug/L		0.1	0.02	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.076	ug/L		0.02	0.004	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.10	ug/L		0.02	0.005	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.518	ug/L		0.05	0.007	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.300	ug/L		0.02	0.004	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.706	ug/L		0.02	0.004	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	1.24	ug/L		0.1	0.02	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.3	ug/L		0.1	0.03	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.04	ug/L	J	0.05	0.01	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Boron, B	0.520	mg/L		0.005	0.001	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	158	mg/L		0.02	0.004	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.0112	mg/L		0.0002	0.00006	GES	09/20/2018 03:13	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	2.17	pCi/L	0.18	0.50	jls	9/24/2018	SW-846 9320-2014, Rev. 1.0
The LFBDB spike recovery is outside the established range of 75-125%. All other QC associated with this batch is acceptable.							
Radium-226	0.736	pCi/L	0.12	0.13	jls	9/27/2018	SW-846 9315-1986, Rev. 0

*\*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.*

MW-12D

Sample Number: 183093-003

Date Collected: 08/30/2018 08:45

Date Received: 9/5/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.20	ug/L		0.05	0.01	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Arsenic, As	3.39	ug/L		0.05	0.01	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Barium, Ba	65.8	ug/L		0.1	0.02	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.097	ug/L		0.02	0.004	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.31	ug/L		0.02	0.005	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	1.82	ug/L		0.05	0.007	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	2.17	ug/L		0.02	0.004	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Lead, Pb	5.43	ug/L		0.02	0.004	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	872	ug/L		0.1	0.02	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Selenium, Se	3.1	ug/L		0.1	0.03	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.241	ug/L		0.05	0.01	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Boron, B	9.71	mg/L		0.005	0.001	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	141	mg/L		0.02	0.004	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00396	mg/L		0.0002	0.00006	GES	09/20/2018 03:18	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	2.35	pCi/L	0.17	0.48	jls	9/24/2018	SW-846 9320-2014, Rev. 1.0
The LFBSD spike recovery is outside the established range of 75-125%. All other QC associated with this batch is acceptable.							
Radium-226	0.787	pCi/L	0.12	0.10	jls	9/27/2018	SW-846 9315-1986, Rev. 0

The carrier recovery is outside the established range of 30-110%.

**\*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.**

MW-14

Sample Number: 183093-004

Date Collected: 08/30/2018 08:00

Date Received: 9/5/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	1.61	ug/L		0.05	0.01	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.57	ug/L		0.05	0.01	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Barium, Ba	153	ug/L		0.1	0.02	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.034	ug/L		0.02	0.004	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.21	ug/L		0.02	0.005	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.286	ug/L		0.05	0.007	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	1.71	ug/L		0.02	0.004	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Lead, Pb	1.06	ug/L		0.02	0.004	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	31.7	ug/L		0.1	0.02	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Selenium, Se	2.2	ug/L		0.1	0.03	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.03	ug/L	J	0.05	0.01	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Boron, B	2.09	mg/L		0.005	0.001	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	181	mg/L		0.02	0.004	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.380	mg/L		0.0002	0.00006	GES	09/20/2018 03:23	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*

Duplicate

Sample Number: 183093-005

Date Collected: 08/30/2018 08:30

Date Received: 9/5/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.10	ug/L		0.05	0.01	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.69	ug/L		0.05	0.01	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Barium, Ba	166	ug/L		0.1	0.02	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.060	ug/L		0.02	0.004	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.14	ug/L		0.02	0.005	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.549	ug/L		0.05	0.007	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.821	ug/L		0.02	0.004	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.831	ug/L		0.02	0.004	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	4.96	ug/L		0.1	0.02	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.3	ug/L		0.1	0.03	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.03	ug/L	J	0.05	0.01	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Boron, B	1.22	mg/L		0.005	0.001	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	189	mg/L		0.02	0.004	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00349	mg/L		0.0002	0.00006	GES	09/20/2018 03:28	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*

Equipment Blank

Sample Number: 183093-006

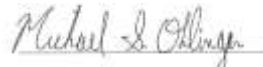
Date Collected: 08/30/2018 09:00

Date Received: 9/5/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.01	ug/L	U	0.05	0.01	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Arsenic, As	< 0.01	ug/L	U	0.05	0.01	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Barium, Ba	0.03	ug/L	J	0.1	0.02	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.004	ug/L	U	0.02	0.004	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.005	ug/L	U	0.02	0.005	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.03	ug/L	J	0.05	0.007	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.007	ug/L	J	0.02	0.004	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.004	ug/L	U	0.02	0.004	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	0.28	ug/L		0.1	0.02	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Selenium, Se	< 0.03	ug/L	U	0.1	0.03	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.01	ug/L	J	0.05	0.01	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Boron, B	0.021	mg/L		0.005	0.001	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	< 0.004	mg/L	U	0.02	0.004	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4
Lithium, Li	< 0.00006	mg/L	U	0.0002	0.00006	GES	09/20/2018 03:33	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit  
 J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*



Michael Ohlinger, Chemist

Email msohlinger@aep.com Tel.

Fax 614-836-4168

Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Michael Ohlinger (614-836-4184)  
 Contacts: Dave Conover (614-836-4219)

**Chain of Custody Record**

Program: Coal Combustion Residuals (CCR)

For Lab Use Only:  
 COC/Order #: 183093

Sample Identification	Site Contact:		Date:		For Lab Use Only:	
	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Analysis Turnaround Time (in Calendar Days)
	Ⓢ Routine (28 days for Monitoring Wells)					
MW-4D	8/30/2018	830	G	GW	7	
MW-5D	8/30/2018	815	G	GW	4	
MW-12D	8/30/2018	845	G	GW	4	
MW-14	8/30/2018	800	G	GW	1	
DUPLICATE	8/30/2018	830	G	GW	1	
EQUIPMENT BLANK	8/30/2018	900	G	W	1	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Analysis Turnaround Time (in Calendar Days)
						250 mL bottle, pH<2, HNO3
						Field-filter 250 mL bottle, then pH<2, HNO3
						1 L bottle, Cool, 0-6C
						Three (six every 10th) L bottles, pH<2, HNO3

Site Contact: \_\_\_\_\_ Date: \_\_\_\_\_ For Lab Use Only: \_\_\_\_\_

Analysis Turnaround Time (in Calendar Days) \_\_\_\_\_

Ⓢ Routine (28 days for Monitoring Wells)

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other \_\_\_\_\_; F= filter in field

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments: \_\_\_\_\_

**AEP** WATER & WASTE SAMPLE RECEIPT FORM

<u>Cooler</u> Cooler	<u>Package Type</u> Box    Bag    Envelope	<u>Delivery Type</u> PONY    UPS <u>FedEX</u> USPS	Other _____
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Plant/Customer Northwestern    Number of Plastic Containers: 18

Opened By Misgna    Number of Glass Containers: 0

Date/Time 09/05/18 3:00pm    Number of Mercury Containers: 0

Were all temperatures within 0-6°C? Y  N  or N/A Initial: mbk on ice  no ice  
(IR Gun Ser# \_\_\_\_\_, Expir. \_\_\_\_\_) - 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<sup>+6</sup> (pres) (24 hr)    NO<sub>2</sub> or NO<sub>3</sub> (48 hr)    ortho-PO<sub>4</sub> (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: mbk 9/05/18

- 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# 183093    Initial & Date & Time : \_\_\_\_\_

Comments: \_\_\_\_\_

Logged by MSO \_\_\_\_\_

Reviewed by GAB \_\_\_\_\_

**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.





# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 38529	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 10/17/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 219921	<b>Collected Date:</b> 10/15/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-15	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (219921)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Fluoride	2.27	mg/L	0.083	1	EPA 300.0	10/25/2018 9:17		GB

Quality Control Data											
* Quality control units are the same as reported analytical results											

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
10/25/2018	Fluoride	220179	<0.083	10	10	100.0	10	10.4	104.0		0.0	GB
10/25/2018	Fluoride		<0.083									GB
10/25/2018	Fluoride			10	10.2	102.0						GB

<hr style="width: 80%; margin: 0 auto;"/> Laboratory Manager	30-Oct-18 Report Date
--	--------------------------

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.

Shreveport Chemical Laboratory (SCL)  
 502 N. Allen Ave.  
 Shreveport, LA 71101  
 Jonathan Barnhill (318-673-3803)  
 Contacts: John Davis (318-673-3811)

Chain of Custody Record

Program: CCR Fluoride Only

*SRV*  
 10/17/18

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

Analysis Turnaround Time (in Calendar Days)  
 (For a complete list of testing parameters)

**RUSH**

*COC # 38529*

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenneth McDonald

Sample Identification

Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.
MM-15	10/15/2018	G	GW	1

Sampler(s) Initials

Mercury

dissolved Fe and Mn

Fluoride

Ra-226, Ra-228

Sample Specific Notes:

*219921*

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other \_\_\_\_\_; F= filter in field

4

F4

1

4

Special Instructions/QC Requirements & Comments:

**\*\*RUSH - 14 day turnaround - RUSH\*\***

Relinquished by: *KST*

Company: *EAGLE*

Date/Time: *10/17/18 12:02*

Received by:

Date/Time:

Relinquished by:

Company:

Date/Time:

Received by:

Date/Time:

Relinquished by:

Company:

Date/Time:

Received in Laboratory by:

Date/Time:



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
 Shreveport, LA 71101  
 Phone 318-673-3802  
 FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="checkbox"/> Ice Chest	<input type="checkbox"/> Bag	<input type="checkbox"/> Action Pak	<input type="checkbox"/> PCB Mailer	<input type="checkbox"/> Bottle	<input type="checkbox"/> UPS	<input type="checkbox"/> FEDEX	<input type="checkbox"/> US Mail	<input checked="" type="checkbox"/> Walk in	<input type="checkbox"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Parker-Witt  
 Received By SPD  
 Received Date 10/17/18  
 Open Date \_\_\_\_\_

Sample Matrix  
 DGA  PCB Oil  Water  Oil  Soil   
 Solid  Liquid  Other \_\_\_\_\_

Container Temp Read 5  
Thermometer Serial #F04103  
 Correction Factor +1.2  
 Corrected Temp 6.2

Project I.D. 38529

Were samples received on ice? YES  NO

Did container arrive in good condition? YES  NO

Was sample documentation received? YES  NO

Was documentation filled out properly? YES  NO

Were samples labeled properly? YES  NO

Were correct containers used? YES  NO

Were the pH's of samples appropriately checked? YES  NO  N/A

Total number of sample containers 1

Was any corrective action taken? NO  Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 38393	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 09/20/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 219436	<b>Collected Date:</b> 09/19/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (219436)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/28/2018 10:21	U	LNLM
<b>Water (219436)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	31	mg/L	0.219	1	EPA 300.0	09/26/2018 12:31		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	09/26/2018 12:31	U	GB
Solids, Total Dissolved (TDS)	884	mg/L	2	1	SM 2540 C-2011	09/24/2018 9:45		LBH
Sulfate	260	mg/L	0.140	1:10	EPA 300.0	09/26/2018 12:50		GB

<b>AEP Sample ID</b> : 219437	<b>Collected Date:</b> 09/19/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (219437)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/28/2018 10:37	U	LNLM
<b>Water (219437)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	30	mg/L	0.219	1	EPA 300.0	09/26/2018 13:09		GB
Fluoride	0.7519	mg/L	0.083	1	EPA 300.0	09/26/2018 13:09	J	GB
Solids, Total Dissolved (TDS)	662	mg/L	2	1	SM 2540 C-2011	09/24/2018 9:45		LBH
Sulfate	134	mg/L	0.140	1:10	EPA 300.0	09/26/2018 13:28		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 38393	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 09/20/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 219438	<b>Collected Date:</b> 09/19/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

**Metals (219438)**

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000012	mg/L	0.000005	1	EPA 7470A 1994	09/28/2018 10:40	J	LNM

**Water (219438)**

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	21	mg/L	0.219	1	EPA 300.0	09/26/2018 13:47		GB
Fluoride	2.8416	mg/L	0.083	1	EPA 300.0	09/26/2018 13:47		GB
Solids, Total Dissolved (TDS)	1052	mg/L	2	1	SM 2540 C-2011	09/24/2018 9:45		LBH
Sulfate	582	mg/L	0.140	1:10	EPA 300.0	09/26/2018 14:24		GB

<b>AEP Sample ID</b> : 219439	<b>Collected Date:</b> 09/19/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-17	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

**Metals (219439)**

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/28/2018 10:48	U	LNM

<b>AEP Sample ID</b> : 219440	<b>Collected Date:</b> 09/19/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Duplicate	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

**Metals (219440)**

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/28/2018 10:51	U	LNM

**Water (219440)**

Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	31	mg/L	0.219	1	EPA 300.0	09/26/2018 15:02		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	09/26/2018 15:02	U	GB
Solids, Total Dissolved (TDS)	870	mg/L	2	1	SM 2540 C-2011	09/24/2018 9:45		LBH
Sulfate	263	mg/L	0.140	1:10	EPA 300.0	09/26/2018 15:21		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 38393	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 09/20/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 219441	<b>Collected Date:</b> 09/19/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (219441)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	09/28/2018 10:53	U	LNM

Quality Control Data												
* Quality control units are the same as reported analytical results												
Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
9/26/2018	Chloride	219573	<0.219									
9/26/2018	Chloride		<0.219									GB
9/28/2018	Mercury	219436.2	<0.00000	0.001	0.00087	87.0	0.001	0.0007912	79.1		6.9	LNM
9/24/2018	Solids, Total Dissolved (TDS)	219360	<2	94	100	106.4	2768	2754	99.5		2.6	LBH
9/26/2018	Sulfate	219573	<0.140	18	18	100.0	20	20	100.0		0.0	GB
9/26/2018	Sulfate		<0.140	20	18	90.0						GB
9/26/2018	Sulfate		<0.140									GB

**Code Code Description**

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- U Analyte concentration below MDL.

*Sandra D. Wallace*  
\_\_\_\_\_  
Laboratory Manager

05-Nov-18  
\_\_\_\_\_  
Report Date

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

S.S. 9-20-18

**Shreveport Chemical Laboratory (SCL)**  
 502 N. Allen Ave.  
 Shreveport, LA 71101  
 Jonathan Barnhill (318-673-3803)  
 Contacts: John Davis (318-673-3811)

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816

Analysis Turnaround Time (in Calendar Days)  
 Routine (28 days for Monitoring Wells)

Sampler(s): Kenneth McDonald

Site Contact: \_\_\_\_\_ Date: \_\_\_\_\_

For Lab Use Only:  
 COC/Order #: COC# 38393

Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes				Sample Specific Notes	
							Mercury	dissolved Fe and Mn	TDS, F, Cl, SO4	Ra-226, Ra-228		
MW-4D	9/19/2018	1336	G	GW	2		X		X			219436.1 - 219436.2
MW-5D	9/19/2018	1232	G	GW	2		X		X			219437.1 - 219437.2
MW-12D	9/19/2018	1107	G	GW	2		X		X			219438.1 - 219438.2
MW-17	9/19/2018	1402	G	GW	1		X		X			219439
DUPLICATE	9/19/2018	1336	G	GW	2		X					219440.1 - 219440.2
EQUIPMENT BLANK	9/19/2018	1420	G	GW	1		X					219441
Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other ; F= filter in field							4	F4	1	4		

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: JPM Company: EAGLE Date/Time: 09/20/18 1332 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received in Laboratory by: KCM Date/Time: 9/20/18 13:38



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
 Shreveport, LA 71101  
 Phone 318-673-3802  
 FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type				Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input checked="" type="radio"/> Walk in Shuttle
Other _____				Other _____				
Tracking # _____								

Client <u>Jill Parker - Witt</u>	Sample Matrix
Received By <u>JTO</u>	<input type="radio"/> DGA <input type="radio"/> PCB Oil <input checked="" type="radio"/> Water <input type="radio"/> Oil <input type="radio"/> Soil
Received Date <u>9/20/18</u>	
Open Date _____	<input type="radio"/> Solid <input type="radio"/> Liquid <input type="radio"/> Other _____

Container Temp Read <u>2</u>	Project I.D. <u>38393</u>
Correction Factor <u>+1.2</u>	Thermometer Serial #F04103
Corrected Temp <u>3.2</u>	Were samples received on ice? <input checked="" type="radio"/> YES <input type="radio"/> NO

Did container arrive in good condition?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Was sample documentation received?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Was documentation filled out properly?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Were samples labeled properly?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Were correct containers used?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Were the pH's of samples appropriately checked?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Total number of sample containers <u>10</u>		
Was any corrective action taken?	<input checked="" type="radio"/> NO	Person Contacted _____ Date & Time _____

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Sample ID	Analysis	pH	Preservative Added / Lot #
MW-40	Mercury	L2	/
MW-50	↓	↓	/
MW-120			/
MW-17			/
Dup			/
Equip Blank	↓	↓	/
			/
			/
			/
			/
			/
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			/
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			/
			/
			/
			/
			/
			/



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

**Water Analysis**

**Location: Northeastern Station**

**Report Date: 11/8/2018**

**MW-4D**  
**Sample Number: 183323-001**                      **Date Collected: 09/19/2018 13:36**                      **Date Received: 9/24/2018**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.04	ug/L	J	0.1	0.02	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.20	ug/L		0.1	0.03	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Barium, Ba	177	ug/L		0.1	0.02	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.02	ug/L	J	0.1	0.02	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.03	ug/L	J	0.05	0.01	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.273	ug/L		0.2	0.04	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.551	ug/L		0.05	0.02	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.595	ug/L		0.1	0.02	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	3.71	ug/L		2	0.4	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.2	ug/L		0.2	0.03	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Boron, B	1.13	mg/L		0.005	0.0009	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	174	mg/L		0.02	0.003	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00289	mg/L		0.0002	0.00001	GES	09/28/2018 05:21	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit  
 J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	3.46	pCi/L	0.30	0.88	jls	10/30/2018	SW-846 9320-2014, Rev. 1.0
Radium-226	0.45	pCi/L	0.11	0.17	jls	10/31/2018	SW-846 9315-1986, Rev. 0

The sample and duplicate result is below the critical value of 0.95 pCi/L. This resulted in the RPD exceeding 25% between the two results.

*\*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.*

MW-5D

Sample Number: 183323-002

Date Collected: 09/19/2018 12:32

Date Received: 9/24/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.13	ug/L		0.1	0.02	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.18	ug/L		0.1	0.03	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Barium, Ba	118	ug/L		0.1	0.02	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.08	ug/L	J	0.1	0.02	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.09	ug/L		0.05	0.01	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.745	ug/L		0.2	0.04	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.336	ug/L		0.05	0.02	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.720	ug/L		0.1	0.02	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	2	ug/L	J	2	0.4	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.4	ug/L		0.2	0.03	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Boron, B	0.444	mg/L		0.005	0.0009	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	156	mg/L		0.02	0.003	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.0107	mg/L		0.0002	0.00001	GES	09/28/2018 05:26	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	4.85	pCi/L	0.25	0.65	jls	10/30/2018	SW-846 9320-2014,Rev. 1.0
Radium-226	0.313	pCi/L	0.091	0.16	jls	10/31/2018	SW-846 9315-1986,Rev. 0

*\*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.*

MW-12D

Sample Number: 183323-003

Date Collected: 09/19/2018 11:07

Date Received: 9/24/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.36	ug/L		0.1	0.02	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Arsenic, As	4.67	ug/L		0.1	0.03	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Barium, Ba	82.6	ug/L		0.1	0.02	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.1	ug/L	J	0.1	0.02	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.33	ug/L		0.05	0.01	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	2.03	ug/L		0.2	0.04	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	1.57	ug/L		0.05	0.02	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Lead, Pb	5.18	ug/L		0.1	0.02	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	828	ug/L		2	0.4	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Selenium, Se	2.9	ug/L		0.2	0.03	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	0.2	ug/L	J	0.5	0.1	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Boron, B	9.02	mg/L		0.005	0.0009	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	110	mg/L		0.02	0.003	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00410	mg/L		0.0002	0.00001	GES	09/28/2018 05:31	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	3.77	pCi/L	0.23	0.60	jls	10/30/2018	SW-846 9320-2014,Rev. 1.0
Radium-226	0.647	pCi/L	0.11	0.12	jls	10/31/2018	SW-846 9315-1986,Rev. 0

The carrier recovery is outside the established range of 30-110%.

*\*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.*

MW-17

Sample Number: 183323-004

Date Collected: 09/19/2018 14:02

Date Received: 9/24/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.20	ug/L		0.1	0.02	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Arsenic, As	0.27	ug/L		0.1	0.03	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Barium, Ba	36.7	ug/L		0.1	0.02	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.02	ug/L	U	0.1	0.02	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.07	ug/L		0.05	0.01	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.04	ug/L	U	0.2	0.04	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	2.98	ug/L		0.05	0.02	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.06	ug/L	J	0.1	0.02	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	9.62	ug/L		2	0.4	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Selenium, Se	4.4	ug/L		0.2	0.03	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Boron, B	0.767	mg/L		0.005	0.0009	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	330	mg/L		0.02	0.003	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.0121	mg/L		0.0002	0.00001	GES	09/28/2018 05:36	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*

Duplicate

Sample Number: 183323-005

Date Collected: 09/19/2018 13:36

Date Received: 9/24/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.04	ug/L	J	0.1	0.02	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.27	ug/L		0.1	0.03	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Barium, Ba	187	ug/L		0.1	0.02	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.02	ug/L	U	0.1	0.02	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.02	ug/L	J	0.05	0.01	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.346	ug/L		0.2	0.04	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.576	ug/L		0.05	0.02	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.246	ug/L		0.1	0.02	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	3.97	ug/L		2	0.4	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.2	ug/L		0.2	0.03	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Boron, B	1.10	mg/L		0.005	0.0009	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	187	mg/L		0.02	0.003	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00277	mg/L		0.0002	0.00001	GES	10/09/2018 17:59	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*

Equipment Blank

Sample Number: 183323-006

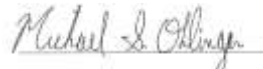
Date Collected: 09/19/2018 14:20

Date Received: 9/24/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Arsenic, As	< 0.03	ug/L	U	0.1	0.03	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Barium, Ba	0.06	ug/L	J	0.1	0.02	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.02	ug/L	U	0.1	0.02	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.01	ug/L	U	0.05	0.01	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.04	ug/L	U	0.2	0.04	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	< 0.02	ug/L	U	0.05	0.02	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.02	ug/L	U	0.1	0.02	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Selenium, Se	< 0.03	ug/L	U	0.2	0.03	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Boron, B	0.030	mg/L		0.005	0.0009	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.02	mg/L	J	0.02	0.003	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00002	mg/L	J	0.0002	0.00001	GES	09/28/2018 05:46	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit  
 J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*



**Michael Ohlinger, Chemist**

Email [msohlinger@aep.com](mailto:msohlinger@aep.com) Tel.

Fax 614-836-4168

Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Michael Ohlinger (614-836-4184)  
 Contacts: Dave Conover (614-836-4219)

Project Name: Northeastern PP CCR

Contact Name: Jill Parker-Witt

Contact Phone: 318-673-3816

Sampler(s): Kenny McDonald

Site Contact: \_\_\_\_\_ Date: \_\_\_\_\_  
 For Lab Use Only:  
 COC/Order #: **183323**

Analysis Turnaround Time (in Calendar Days)

⊙ Routine (28 days for Monitoring Wells)

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	# of Cont.	Matrix	Sampler(s) Initials	250 mL bottle, pH<2, HNO3	Field-filter 250 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th*) L bottles, pH<2, HNO3	Date	COC/Order #	Sample Specific Notes:
							B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, TL	Dissolved B, Sb, As, Ba, Be, Ca, Cd, Cr, Co, Fe, K, Li, Mg, Mn, Mo, Na, Pb, Se, Sr, Ti	TDS, F, Cl, SO4	Ra-226, Ra-228			
MW-4D	9/19/2018	1336	G	7	GW		X			X			
MW-5D	9/19/2018	1232	G	4	GW		X			X			
MW-12D	9/19/2018	1107	G	4	GW		X			X			
MW-17	9/19/2018	1402	G	1	GW		X						
DUPLICATE	9/19/2018	1336	G	1	GW		X						
EQUIPMENT BLANK	9/19/2018	1420	G	1	W		X						

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field  
 \* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: *KPM* Date/Time: 09/20/18 1400  
 Relinquished by: *ESG* Date/Time: 09/20/18 1400  
 Relinquished by: *ESG* Date/Time: 09/20/18 1400  
 Received by: *[Signature]* Date/Time: 9-24-18 2:40  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received in Laboratory by: \_\_\_\_\_ Date/Time: \_\_\_\_\_



**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>				<u>Delivery Type</u>			
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS
				Other _____			
Plant/Customer <u>Northlark PP</u>				Number of Plastic Containers: <u>18</u>			
Opened By <u>SM</u>				Number of Glass Containers: _____			
Date/Time <u>9-24-18 3:2:40</u>				Number of Mercury Containers: _____			
Were all temperatures within 0-6°C? Y / N or N/A Initial: <u>SM</u> on ice / no ice (IR Gun Ser# <u>17077903</u> Expir. <u>1-7-19</u> ) - If No, specify each deviation: _____							
Was container in good condition? <input checked="" type="radio"/> Y / <input checked="" type="radio"/> N Comments <u>The cooler was thrown away.</u> *							
Was Chain of Custody received? Y / N Comments _____							
Requested turnaround: <u>Detail</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: MSO 9-24-18

- 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# 183323 Initial & Date & Time : \_\_\_\_\_

Logged by SM Comments The cooler had a broken handle and was thrown away for this reason.

Reviewed by MSO

**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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 38529	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 10/17/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 219921	<b>Collected Date:</b> 10/15/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-15	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (219921)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Fluoride	2.27	mg/L	0.083	1	EPA 300.0	10/25/2018 9:17		GB

Quality Control Data											
* Quality control units are the same as reported analytical results											

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
10/25/2018	Fluoride	220179	<0.083	10	10	100.0	10	10.4	104.0		0.0	GB
10/25/2018	Fluoride		<0.083									GB
10/25/2018	Fluoride			10	10.2	102.0						GB

<hr style="width: 80%; margin: 0 auto;"/> Laboratory Manager	30-Oct-18 Report Date
--	--------------------------

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.

Shreveport Chemical Laboratory (SCL)  
 502 N. Allen Ave.  
 Shreveport, LA 71101

**Contacts:** *Jonathan Barnhill (318-673-3803)*  
*John Davis (318-673-3811)*

Project Name: Northeastern PP CCR

Contact Name: Jill Parker-Witt

Contact Phone: 318-673-3816

Sampler(s): Kenneth McDonald

### Chain of Custody Record

*SWL*

Program: CCR Fluoride Only

*10/17/18*

Site Contact: Date:

COC/Order #: For Lab Use Only:

Analysis Turnaround Time (in Calendar Days)  
~~30 (calendar days for laboratory processing)~~

**RUSH**

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials				Sample Specific Notes:									
						500 mL bottle, pH<2, HNO3	Field-filter 500 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th) L bottles, pH<2, HNO3										
MMW-15	10/15/2018	1240	G	GW	1	Mercury					Fluoride								219921

Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	10/15/2018															

**Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other** ; F= filter in field

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

**\*\*RUSH - 14 day turnaround - RUSH\*\***

Relinquished by: *Kurt McD*    Company: *EAGLE*    Date/Time: *10/17/18 12:02*    Received by: \_\_\_\_\_    Date/Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_    Company: \_\_\_\_\_    Date/Time: \_\_\_\_\_    Received In Laboratory by: \_\_\_\_\_    Date/Time: \_\_\_\_\_

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="checkbox"/> Ice Chest	<input type="checkbox"/> Bag	<input type="checkbox"/> Action Pak	<input type="checkbox"/> PCB Mailer	<input type="checkbox"/> Bottle	<input type="checkbox"/> UPS	<input type="checkbox"/> FEDEX	<input type="checkbox"/> US Mail	<input checked="" type="checkbox"/> Walk in	<input type="checkbox"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Parker-Witt  
 Received By SPD  
 Received Date 10/17/18  
 Open Date \_\_\_\_\_

Sample Matrix  
 DGA  PCB Oil  Water  Oil  Soil   
 Solid  Liquid  Other \_\_\_\_\_

Container Temp Read 5  
Thermometer Serial #F04103  
 Correction Factor +1.2  
 Corrected Temp 6.2

Project I.D. 38529

Were samples received on ice? YES  NO

Did container arrive in good condition? YES  NO

Was sample documentation received? YES  NO

Was documentation filled out properly? YES  NO

Were samples labeled properly? YES  NO

Were correct containers used? YES  NO

Were the pH's of samples appropriately checked? YES  NO  N/A

Total number of sample containers 1

Was any corrective action taken? NO  Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 38595	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 10/24/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 220156	<b>Collected Date:</b> 10/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-3D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (220156)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	14.89	mg/L	0.219	1	EPA 300.0	10/26/2018 10:52		GB
Fluoride	1.09	mg/L	0.083	1	EPA 300.0	10/26/2018 10:52		GB
Solids, Total Dissolved (TDS)	702	mg/L	2	1	SM 2540 C-2011	10/26/2018 15:30		JTD
Sulfate	210.57	mg/L	0.140	1:10	EPA 300.0	10/26/2018 11:11		GB

<b>AEP Sample ID</b> : 220157	<b>Collected Date:</b> 10/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-6D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (220157)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	31.68	mg/L	0.219	1	EPA 300.0	10/26/2018 11:30		GB
Fluoride	1.28	mg/L	0.083	1	EPA 300.0	10/26/2018 11:30		GB
Solids, Total Dissolved (TDS)	1152	mg/L	2	1	SM 2540 C-2011	10/26/2018 15:30		JTD
Sulfate	471.81	mg/L	0.140	1:10	EPA 300.0	10/26/2018 11:49		GB

<b>AEP Sample ID</b> : 220158	<b>Collected Date:</b> 10/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-7D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (220158)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	568.00	mg/L	0.219	1:10	EPA 300.0	10/26/2018 12:27		GB
Fluoride	0.9527	mg/L	0.083	50	EPA 300.0	10/26/2018 12:08	J	GB
Solids, Total Dissolved (TDS)	5844	mg/L	2	1	SM 2540 C-2011	10/26/2018 15:30		JTD
Sulfate	1374.80	mg/L	0.140	1:50	EPA 300.0	10/26/2018 19:21		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 38595	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 10/24/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 220159	<b>Collected Date:</b> 10/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-8D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (220159)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	11680.46	mg/L	0.219	1:100	EPA 300.0	10/26/2018 14:20		GB
Fluoride	< 0.083	mg/L	0.083	1	EPA 300.0	10/26/2018 12:46	U	GB
Solids, Total Dissolved (TDS)	20896	mg/L	2	1	SM 2540 C-2011	10/26/2018 15:30		JTD
Sulfate	48.41	mg/L	0.140	1	EPA 300.0	10/26/2018 12:46		GB

<b>AEP Sample ID</b> : 220160	<b>Collected Date:</b> 10/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-9D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (220160)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	106	mg/L	0.219	1	EPA 300.0	10/26/2018 14:38		GB
Fluoride	0.600	mg/L	0.083	1	EPA 300.0	10/26/2018 14:38	J	GB
Solids, Total Dissolved (TDS)	1258	mg/L	2	1	SM 2540 C-2011	10/26/2018 15:30		JTD
Sulfate	519.42	mg/L	0.140	1:100	EPA 300.0	10/26/2018 14:57		GB

<b>AEP Sample ID</b> : 220161	<b>Collected Date:</b> 10/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-15	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (220161)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	46.81	mg/L	0.219	1	EPA 300.0	10/26/2018 15:16		GB
Fluoride	2.17	mg/L	0.083	1	EPA 300.0	10/26/2018 15:16		GB
Solids, Total Dissolved (TDS)	1082	mg/L	2	1	SM 2540 C-2011	10/26/2018 15:30		JTD
Sulfate	549.46	mg/L	0.140	1:10	EPA 300.0	10/26/2018 15:35		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 38595	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 10/24/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 220162	<b>Collected Date:</b> 10/22/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Duplicate - Landfill	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (220162)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	16.36	mg/L	0.219	1	EPA 300.0	10/26/2018 16:13		GB
Fluoride	1.13	mg/L	0.083	10	EPA 300.0	10/26/2018 16:13		GB
Solids, Total Dissolved (TDS)	722	mg/L	2	1	SM 2540 C-2011	10/26/2018 15:30		JTD
Sulfate	241.48	mg/L	0.140	1:10	EPA 300.0	10/26/2018 17:47		GB

Quality Control Data												
* Quality control units are the same as reported analytical results												
Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
10/26/2018	Chloride	220162.1	<0.219	20	22.8	114.0	20	21	105.0		11.5	GB
10/26/2018	Chloride		<0.219									GB
10/26/2018	Chloride			20	22.4	112.0						GB
10/26/2018	Fluoride	220162.1	<0.083	10	10.58	105.8	10	11.5	115.0		1.8	GB
10/26/2018	Fluoride		<0.083									GB
10/26/2018	Fluoride			10	11.03	110.3						GB
10/26/2018	Solids, Total Dissolved (TDS)	220156.1	<2	99.33	106	106.7	2802	2810	100.3		0.3	JTD
10/26/2018	Sulfate	220162.1	<0.140	20	18.8	94.0	50	62.2	124.4		2.2	GB
10/26/2018	Sulfate		<0.140									GB
10/26/2018	Sulfate			20	18.6	93.0						GB

**Code Code Description**

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- U Analyte concentration below MDL.

*Sandra D. Wallace*  
 \_\_\_\_\_  
 Laboratory Manager

07-Nov-18  
 \_\_\_\_\_  
 Report Date

Shreveport Chemical Laboratory (SCL)

502 N. Allen Ave.

Shreveport, LA 71101

Contacts: Jonathan Barnhill (318-673-3803)

John Davis (318-673-3811)

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

SA  
10/25/18

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

Analysis Turnaround Time (in Calendar Days)  
 Routine (28 days for Monitoring Wells)

COC# 38595

Project Name: Northeastern PP CCR

Contact Name: Jill Parker-Witt

Contact Phone: 318-673-3816

Sampler(s): Kenneth McDonald

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Mercury				dissolved Fe and Mn				TDS, F, Cl, SO4				Ra-226, Ra-228				Sample Specific Notes:
						500 mL bottle, pH<2, HNO3	Field-filter 500 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th) L bottles, pH<2, HNO3	4	F4	1	4	4	F4	1	4					

MM-3D 10/22/2018 840 G GW 1 1 4 F4 1 4 4 220156

MM-6D 10/22/2018 900 G GW 1 1 4 F4 1 4 4 220157

MM-7D 10/22/2018 1100 G GW 1 1 4 F4 1 4 4 220158

MM-8D 10/22/2018 1040 G GW 1 1 4 F4 1 4 4 220159

MM-9D 10/22/2018 920 G GW 1 1 4 F4 1 4 4 220160

MM-15 10/22/2018 940 G GW 1 1 4 F4 1 4 4 220161

DUPLICATE - LANDFILL 10/22/2018 840 G GW 1 1 4 F4 1 4 4 220162

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= Filter in field

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: *HTM* Company: *EAGLE* Date/Time: *10/24/18 16:25* Received by: *[Signature]* Date/Time: *10/24/18 16:25*

Relinquished by: Company: Date/Time: Received by: Date/Time:

Relinquished by: Company: Date/Time: Received in Laboratory by: Date/Time: *10/24/18 16:25*





SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Parker With  
 Received By JTD  
 Received Date 10/24/18  
 Open Date \_\_\_\_\_

Sample Matrix  
 DGA  PCB Oil   Water  Oil  Soil  
 Solid  Liquid  Other \_\_\_\_\_

Container Temp Read 0  
Thermometer Serial #F04103  
 Correction Factor +1.2  
 Corrected Temp 1.2

Project I.D. 38595

Were samples received on ice?  YES  NO

Did container arrive in good condition?  YES  NO \_\_\_\_\_

Was sample documentation received?  YES  NO \_\_\_\_\_

Was documentation filled out properly?  YES  NO \_\_\_\_\_

Were samples labeled properly?  YES  NO \_\_\_\_\_

Were correct containers used?  YES  NO \_\_\_\_\_

Were the pH's of samples appropriately checked? YES  NO N/A \_\_\_\_\_

Total number of sample containers 7

Was any corrective action taken?  NO  YES

Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

### Water Analysis

**Location: Northeastern Station**

**Report Date: 11/16/2018**

**MW-3D**  
Sample Number: 183735-001      Date Collected: 10/22/2018 08:40      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.02	mg/L		0.02	0.005	GES	11/14/2018 15:32	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	142	mg/L		0.1	0.02	GES	11/14/2018 15:32	EPA 200.8-1994, Rev. 5.4

**MW-6D**  
Sample Number: 183735-002      Date Collected: 10/22/2018 09:00      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	4.34	mg/L		0.02	0.005	GES	11/14/2018 15:37	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	237	mg/L		0.1	0.02	GES	11/14/2018 15:37	EPA 200.8-1994, Rev. 5.4

**MW-7D**  
Sample Number: 183735-003      Date Collected: 10/22/2018 11:00      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.10	mg/L		0.02	0.005	GES	11/14/2018 15:42	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	357	mg/L		0.1	0.02	GES	11/14/2018 15:42	EPA 200.8-1994, Rev. 5.4

**MW-8D**  
Sample Number: 183735-004      Date Collected: 10/22/2018 10:40      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.75	mg/L		0.1	0.02	GES	11/14/2018 15:47	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	1290	mg/L		0.4	0.06	GES	11/14/2018 15:47	EPA 200.8-1994, Rev. 5.4

**MW-9D**  
Sample Number: 183735-005      Date Collected: 10/22/2018 09:20      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	7.19	mg/L		0.02	0.005	GES	11/14/2018 15:52	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	199	mg/L		0.1	0.02	GES	11/14/2018 15:52	EPA 200.8-1994, Rev. 5.4

**MW-15**

Sample Number: 183735-006 Date Collected: 10/22/2018 09:40 Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	8.90	mg/L		0.02	0.005	GES	11/14/2018 15:57	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	250	mg/L		0.1	0.02	GES	11/14/2018 15:57	EPA 200.8-1994, Rev. 5.4

**Duplicate - Landfill**

Sample Number: 183735-007 Date Collected: 10/22/2018 08:40 Date Received: 10/30/2018

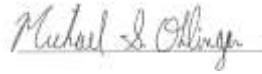
Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.985	mg/L		0.02	0.005	GES	11/14/2018 16:02	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	141	mg/L		0.1	0.02	GES	11/14/2018 16:02	EPA 200.8-1994, Rev. 5.4

**Equipment Blank**

Sample Number: 183735-008 Date Collected: 10/22/2018 11:20 Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.015	mg/L		0.005	0.0009	GES	11/14/2018 16:06	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.005	mg/L	J	0.02	0.003	GES	11/14/2018 16:06	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit  
J: Analyte was positively identified, though the quantitation was below Reporting Limit.



**Michael Ohlinger, Chemist**

Email [msohlinger@aep.com](mailto:msohlinger@aep.com) Tel.

Fax 614-836-4168 Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

### Water Analysis

**Location: Northeastern Station**

**Report Date: 11/16/2018**

**MW-3D**  
Sample Number: 183735-001      Date Collected: 10/22/2018 08:40      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.02	mg/L		0.02	0.005	GES	11/14/2018 15:32	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	142	mg/L		0.1	0.02	GES	11/14/2018 15:32	EPA 200.8-1994, Rev. 5.4

**MW-6D**  
Sample Number: 183735-002      Date Collected: 10/22/2018 09:00      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	4.34	mg/L		0.02	0.005	GES	11/14/2018 15:37	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	237	mg/L		0.1	0.02	GES	11/14/2018 15:37	EPA 200.8-1994, Rev. 5.4

**MW-7D**  
Sample Number: 183735-003      Date Collected: 10/22/2018 11:00      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.10	mg/L		0.02	0.005	GES	11/14/2018 15:42	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	357	mg/L		0.1	0.02	GES	11/14/2018 15:42	EPA 200.8-1994, Rev. 5.4

**MW-8D**  
Sample Number: 183735-004      Date Collected: 10/22/2018 10:40      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.75	mg/L		0.1	0.02	GES	11/14/2018 15:47	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	1290	mg/L		0.4	0.06	GES	11/14/2018 15:47	EPA 200.8-1994, Rev. 5.4

**MW-9D**  
Sample Number: 183735-005      Date Collected: 10/22/2018 09:20      Date Received: 10/30/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	7.19	mg/L		0.02	0.005	GES	11/14/2018 15:52	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	199	mg/L		0.1	0.02	GES	11/14/2018 15:52	EPA 200.8-1994, Rev. 5.4

MW-15

Sample Number: 183735-006 Date Collected: 10/22/2018 09:40 Date Received: 10/30/2018

Table with 8 columns: Parameter, Result, Units, Data Qual, RL, MDL, Analysis By, Analysis Date/Time, Method. Rows for Boron, B and Calcium, Ca.

Duplicate - Landfill

Sample Number: 183735-007 Date Collected: 10/22/2018 08:40 Date Received: 10/30/2018

Table with 8 columns: Parameter, Result, Units, Data Qual, RL, MDL, Analysis By, Analysis Date/Time, Method. Rows for Boron, B and Calcium, Ca.

Equipment Blank

Sample Number: 183735-008 Date Collected: 10/22/2018 11:20 Date Received: 10/30/2018

Table with 8 columns: Parameter, Result, Units, Data Qual, RL, MDL, Analysis By, Analysis Date/Time, Method. Rows for Boron, B and Calcium, Ca.

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Handwritten signature of Michael Ohlinger

Michael Ohlinger, Chemist

Email msohlinger@aep.com Tel.

Fax 614-836-4168 Audinet 8-210-

THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.



**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<p style="text-align: center;"><u>Package Type</u></p> <p> <input checked="" type="radio"/> Cooler            <input type="radio"/> Box            <input type="radio"/> Bag            <input type="radio"/> Envelope       </p>	<p style="text-align: center;"><u>Delivery Type</u></p> <p>         PONY    UPS    <input checked="" type="radio"/> FedEx            USPS       </p> <p>Other _____</p>			
Plant/Customer <u>Northeastern</u>	Number of Plastic Containers: <u>8</u>			
Opened By <u>MSU</u>	Number of Glass Containers: <u>-</u>			
Date/Time <u>10/30/18 2:30PM</u>	Number of Mercury Containers: <u>-</u>			
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: _____ on ice / <input checked="" type="radio"/> no ice (IR Gun Ser# <u>17077903</u> Expir. <u>1-7-19</u> ) - If No, specify each deviation: _____				
Was container in good condition? <input checked="" type="radio"/> Y / N Comments _____				
Was Chain of Custody received? <input checked="" type="radio"/> Y / N Comments _____				
Requested turnaround: <u>28 days</u> If RUSH, who was notified? _____				
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: JWB 10/30/2018

- 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# 183735 Initial & Date & Time : \_\_\_\_\_

Logged by MSU Comments: \_\_\_\_\_

Reviewed by JWB \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 38807	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 11/29/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 220948	<b>Collected Date:</b> 11/28/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-3D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals		

Water (220948)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Fluoride	0.648	mg/L	0.083	1	EPA 300.0	12/04/2018 16:27	J	GB

<b>AEP Sample ID</b> : 220949	<b>Collected Date:</b> 11/28/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-6D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals		

Water (220949)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Fluoride	0.844	mg/L	0.083	1	EPA 300.0	12/04/2018 17:04	J	GB


### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
12/4/2018	Fluoride	220840	<0.083	10	10	100.0	10	10.1	101.0	0.0	GB	
12/4/2018	Fluoride		<0.083								GB	
12/4/2018	Fluoride			10	10	100.0					GB	

### Code Code Description

J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).

  
Laboratory Manager

19-Dec-18  
Report Date



# Chain of Custody Record

508 11-29-18

**Program: 2ND HALF 2018 DETECTION MONITORING; 2 OF 2**

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

**Shreveport Chemical Laboratory (SCL)**  
 502 N. Allen Ave.  
 Shreveport, LA 71101  
**Jonathan Barnhill (318-673-3803)**  
**Contacts: John Davis (318-673-3811)**

**Project Name:** Northeastern PP CCR  
**Contact Name:** Jill Parker-Witt  
**Contact Phone:** 318-673-3816  
**Sampler(s):** Kenneth McDonald

**Analysis Turnaround Time (In Calendar Days)**  
 Routine (28 days for Monitoring Wells)

500 mL bottle, pH<2, HNO3	Field-filter 500 mL bottle, then pH<2, HNO3	500 mL bottle, Cool, 0-6C	Three (six every 10th*) L bottles, pH<2, HNO3
<b>Mercury</b>	dissolved Fe and Mn	<b>Fluoride</b>	<b>Ra-226, Ra-228</b>

Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Sample Specific Notes:
MMW-3D	11/28/2018	930	G	GW	1		220948
MMW-6D	11/28/2018	950	G	GW	1		220949

**Preservation Used:** 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH; 6= Other \_\_\_\_\_ ; F= filter in field

\* Six 1L Bottles must be collected for Radium for every 10th sample.

**Special Instructions/QC Requirements & Comments:**

<b>Relinquished by:</b> <i>KAMJ</i>	<b>Company:</b> <i>EAGLE</i>	<b>Date/Time:</b> <i>11/29/18 1610</i>	<b>Received by:</b>	<b>Date/Time:</b>
<b>Relinquished by:</b>	<b>Company:</b>	<b>Date/Time:</b>	<b>Received by:</b>	<b>Date/Time:</b>
<b>Relinquished by:</b>	<b>Company:</b>	<b>Date/Time:</b>	<b>Received in Laboratory by:</b> <i>[Signature]</i>	<b>Date/Time:</b> <i>11/29/18 16:10</i>



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

### PROJECT RECEIPT FORM

Container Type				Delivery Type					
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____				Other _____					
				Tracking # _____					

Client Jill Parker-Witt  
Received By JTW  
Received Date 11/29/18  
Open Date \_\_\_\_\_

Sample Matrix  
 DGA     PCB Oil     Water     Oil     Soil  
 Solid     Liquid    Other \_\_\_\_\_

Container Temp    Read 0  
Thermometer Serial #F04103  
Correction Factor +1.2  
Corrected Temp 1.2

Project I.D. 38807

Were samples received on ice?  YES    NO

Did container arrive in good condition?  YES    NO

Was sample documentation received?  YES    NO

Was documentation filled out properly?  YES    NO

Were samples labeled properly?  YES    NO

Were correct containers used?  YES    NO

Were the pH's of samples appropriately checked? YES     NO N/A

Total number of sample containers 2

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_  
Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 38805	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 11/29/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 220937	<b>Collected Date:</b> 11/28/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (220937)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	12/06/2018 14:16	U	LNLM
<b>Water (220937)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	27	mg/L	0.219	1	EPA 300.0	12/04/2018 18:38		GB
Fluoride	0.3357	mg/L	0.083	1	EPA 300.0	12/04/2018 18:38	J	GB
Solids, Total Dissolved (TDS)	972	mg/L	2	1	SM 2540 C-2011	12/03/2018 14:18		JTD
Sulfate	295	mg/L	0.140	1:10	EPA 300.0	12/04/2018 18:57		GB

<b>AEP Sample ID</b> : 220938	<b>Collected Date:</b> 11/28/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (220938)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	12/06/2018 14:32	U	LNLM
<b>Water (220938)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24	mg/L	0.219	1	EPA 300.0	12/04/2018 19:16		GB
Fluoride	0.371	mg/L	0.083	1	EPA 300.0	12/04/2018 19:16	J	GB
Solids, Total Dissolved (TDS)	614	mg/L	2	1	SM 2540 C-2011	12/03/2018 14:18		JTD
Sulfate	143	mg/L	0.140	1:10	EPA 300.0	12/04/2018 19:35		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 38805	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 11/29/2018	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 220939	<b>Collected Date:</b> 11/28/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (220939)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000007	mg/L	0.000005	1	EPA 7470A 1994	12/06/2018 14:35	J	LNM

Water (220939)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	16	mg/L	0.219	1	EPA 300.0	12/04/2018 19:54		GB
Fluoride	2.2238	mg/L	0.083	1	EPA 300.0	12/04/2018 19:54		GB
Solids, Total Dissolved (TDS)	1068	mg/L	2	1	SM 2540 C-2011	12/03/2018 14:18		JTD
Sulfate	570	mg/L	0.140	1:10	EPA 300.0	12/04/2018 20:13		GB

<b>AEP Sample ID</b> : 220940	<b>Collected Date:</b> 11/28/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Duplicate	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (220940)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	12/06/2018 14:43	U	LNM

Water (220940)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	28	mg/L	0.219	1	EPA 300.0	12/04/2018 21:47		GB
Fluoride	0.2688	mg/L	0.083	1	EPA 300.0	12/04/2018 21:47	J	GB
Solids, Total Dissolved (TDS)	948	mg/L	2	1	SM 2540 C-2011	12/03/2018 14:18		JTD
Sulfate	329	mg/L	0.140	1:10	EPA 300.0	12/04/2018 23:21		GB

<b>AEP Sample ID</b> : 220941	<b>Collected Date:</b> 11/28/2018	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank	<b>Location:</b> Northeastern P.P.	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Metals (220941)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	12/06/2018 14:45	U	LNM



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

Report ID : 38805  
Date Received: 11/29/2018

Company: SEP - Environmental (JP-W)  
Contact: Jill Parker-Witt  
Phone: (318) 673-3816

Address: 502 N. Allen Avenue  
Shreveport, LA 71101  
Fax: (318) 673-3960

### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
12/4/2018	Chloride	220840	<0.219	20	16.5	82.5	50	61	122.0	7.0	GB	
12/4/2018	Chloride		<0.219		53						GB	
12/4/2018	Chloride			20	16.5	82.5					GB	
12/4/2018	Fluoride	220840	<0.083	10	10	100.0	10	10.1	101.0	0.0	GB	
12/4/2018	Fluoride		<0.083								GB	
12/4/2018	Fluoride			10	10	100.0					GB	
12/6/2018	Mercury	220947.1	<0.00000	0.001	0.00097	97.0	0.001	0.0009558	95.6	0.7	LNM	
12/6/2018	Mercury	220937.1	<0.00000	0.001	0.00097	97.0	0.001	0.0009076	90.8	1.0	LNM	
12/3/2018	Solids, Total Dissolved (TDS)		<2	99.33	100	100.7	2802	2806	100.1	12.0	JTD	
12/4/2018	Sulfate	220840	<0.140	20	17	85.0					GB	
12/4/2018	Sulfate		<0.140								GB	
12/4/2018	Sulfate			20	17	85.0					GB	

### Code Code Description

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- U Analyte concentration below MDL.

*Sandra S. Wallace*  
Laboratory Manager

19-Dec-18  
Report Date

# Chain of Custody Record

508 11-29-18

**Shreveport Chemical Laboratory (SCL)**  
 502 N. Allen Ave.  
 Shreveport, LA 71101  
 Jonathan Barnhill (318-673-3803)  
 Contacts: John Davis (318-673-3811)

## Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

For Lab Use Only:

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenneth McDonald

Analysis Turnaround Time (in Calendar Days)  
 ☉ Routine (28 days for Monitoring Wells)

COC/Order #: *CC# 38805*

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes				Sample Specific Notes		
							Mercury	dissolved Fe and Mn	TDS, F, Cl, SO4	Ra-226, Ra-228			
MMW-4D	11/28/2018	850	G	GW	2		X		X			220937.1 - 220937.2	
MMW-5D	11/28/2018	1135	G	GW	2		X		X			220938.1 - 220938.2	
MMW-12D	11/28/2018	1325	G	GW	2		X		X			220939.1 - 220939.2	
DUPLICATE	11/28/2018	850	G	GW	2		X					220940.1 - 220940.2	
EQUIPMENT BLANK	11/28/2018	1500	G	GW	1		X					220941	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other ; F= filter in field							4	F4	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:									
<i>JSF ml</i>	<i>EA614</i>	<i>11/29/18 1610</i>											
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:									
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:									
			<i>Reem</i>	<i>11/29/18</i>									



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client <u>Jill Parker-Witt</u>	Sample Matrix				
Received By <u>JTD</u>	<input type="radio"/> DGA	<input type="radio"/> PCB Oil	<input checked="" type="radio"/> Water	<input type="radio"/> Oil	<input type="radio"/> Soil
Received Date <u>11/29/18</u>					
Open Date _____	<input type="radio"/> Solid	<input type="radio"/> Liquid	Other _____		

Container Temp Read <u>0</u>	Project I.D. <u>38805</u>
Correction Factor <u>+1.2</u>	Thermometer Serial #F04103
Corrected Temp <u>1.2</u>	Were samples received on ice? <input checked="" type="radio"/> YES <input type="radio"/> NO

Did container arrive in good condition?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Was sample documentation received?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Was documentation filled out properly?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Were samples labeled properly?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Were correct containers used?	<input checked="" type="radio"/> YES	<input type="radio"/> NO
Were the pH's of samples appropriately checked?	<input checked="" type="radio"/> YES	<input checked="" type="radio"/> NO <u>11/29/18</u>
Total number of sample containers <u>9</u>	<u>JTD</u>	
Was any corrective action taken?	<input checked="" type="radio"/> NO	Person Contacted _____ Date & Time _____

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_







Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

**Water Analysis**

**Location: Northeastern Station**

**Report Date: 12/28/2018**

**MW-4D**  
**Sample Number: 184031-001**                      **Date Collected: 11/28/2018 08:50**                      **Date Received: 12/3/2018**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.1	ug/L	U	0.5	0.1	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.31	ug/L		0.5	0.2	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Barium, Ba	171	ug/L		0.5	0.1	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.1	ug/L	U	0.5	0.1	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.06	ug/L	J	0.2	0.05	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.3	ug/L	J	1	0.2	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.677	ug/L		0.2	0.1	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.3	ug/L	J	0.5	0.1	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	8	ug/L	J	10	2	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.2	ug/L	J	1	0.2	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.5	ug/L	U	2	0.5	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Boron, B	1.24	mg/L		0.02	0.005	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	193	mg/L		0.1	0.02	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00378	mg/L		0.001	0.00005	GES	12/17/2018 15:38	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit  
 J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.21	pCi/L	0.17	0.53	jls	12/27/2018	SW-846 9320-2014, Rev. 1.0
Radium-226	0.419	pCi/L	0.087	0.10	jls	12/26/2018	SW-846 9315-1986, Rev. 0

*\*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.*

MW-5D

Sample Number: 184031-002

Date Collected: 11/28/2018 11:35

Date Received: 12/3/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.1	ug/L	U	0.5	0.1	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.15	ug/L		0.5	0.2	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Barium, Ba	113	ug/L		0.5	0.1	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.1	ug/L	U	0.5	0.1	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.06	ug/L	J	0.2	0.05	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.5	ug/L	J	1	0.2	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.324	ug/L		0.2	0.1	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.4	ug/L	J	0.5	0.1	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	2	ug/L	J	10	2	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.3	ug/L	J	1	0.2	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.5	ug/L	U	2	0.5	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Boron, B	0.612	mg/L		0.02	0.005	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	143	mg/L		0.1	0.02	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.0121	mg/L		0.001	0.00005	GES	12/17/2018 15:43	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.99	pCi/L	0.16	0.48	jls	12/27/2018	SW-846 9320-2014, Rev. 1.0
Radium-226	0.403	pCi/L	0.070	0.087	jls	12/26/2018	SW-846 9315-1986, Rev. 0

The carrier recovery is outside the established range of 30-110%.

*\*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.*

MW-12D

Sample Number: 184031-003

Date Collected: 11/28/2018 13:25

Date Received: 12/3/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	0.3	ug/L	J	0.5	0.1	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Arsenic, As	3.99	ug/L		0.5	0.2	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Barium, Ba	71.7	ug/L		0.5	0.1	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	0.1	ug/L	J	0.5	0.1	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.33	ug/L		0.2	0.05	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	1.70	ug/L		1	0.2	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.989	ug/L		0.2	0.1	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Lead, Pb	4.12	ug/L		0.5	0.1	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	744	ug/L		10	2	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Selenium, Se	1.9	ug/L		1	0.2	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.5	ug/L	U	2	0.5	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Boron, B	9.69	mg/L		0.02	0.005	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	103	mg/L		0.1	0.02	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00483	mg/L		0.001	0.00005	GES	12/17/2018 15:48	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Radiochemistry*	Result	Units	UNC* (+ / -)	MDA*	Analysis By	Analysis Date/Time	Method
Radium-228	1.05	pCi/L	0.15	0.46	jls	12/27/2018	SW-846 9320-2014,Rev. 1.0
Radium-226	0.436	pCi/L	0.076	0.084	jls	12/26/2018	SW-846 9315-1986,Rev. 0

The carrier recovery is outside the established range of 30-110%.

*\*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.*

Duplicate

Sample Number: 184031-004

Date Collected: 11/28/2018 08:50

Date Received: 12/3/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.1	ug/L	U	0.5	0.1	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Arsenic, As	1.25	ug/L		0.5	0.2	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Barium, Ba	171	ug/L		0.5	0.1	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.1	ug/L	U	0.5	0.1	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	0.05	ug/L	J	0.2	0.05	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	0.3	ug/L	J	1	0.2	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	0.668	ug/L		0.2	0.1	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Lead, Pb	0.3	ug/L	J	0.5	0.1	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	9	ug/L	J	10	2	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Selenium, Se	0.2	ug/L	J	1	0.2	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.5	ug/L	U	2	0.5	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Boron, B	1.17	mg/L		0.02	0.005	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	201	mg/L		0.1	0.02	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00391	mg/L		0.001	0.00005	GES	12/17/2018 15:53	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*

**Equipment Blank**

Sample Number: 184031-005

Date Collected: 11/28/2018 15:00

Date Received: 12/3/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Antimony, Sb	< 0.02	ug/L	U	0.1	0.02	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Arsenic, As	< 0.03	ug/L	U	0.1	0.03	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Barium, Ba	0.05	ug/L	J	0.1	0.02	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Beryllium, Be	< 0.02	ug/L	U	0.1	0.02	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Cadmium, Cd	< 0.01	ug/L	U	0.05	0.01	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Chromium, Cr	< 0.04	ug/L	U	0.2	0.04	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Cobalt, Co	< 0.02	ug/L	U	0.05	0.02	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Lead, Pb	< 0.02	ug/L	U	0.1	0.02	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Molybdenum, Mo	< 0.4	ug/L	U	2	0.4	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Selenium, Se	< 0.03	ug/L	U	0.2	0.03	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Thallium, Tl	< 0.1	ug/L	U	0.5	0.1	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Boron, B	0.024	mg/L		0.005	0.0009	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.01	mg/L	J	0.02	0.003	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4
Lithium, Li	0.00002	mg/L	J	0.0002	0.00001	GES	12/17/2018 15:58	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*

**MW-3D**

Sample Number: 184031-006

Date Collected: 11/28/2018 09:30

Date Received: 12/3/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.964	mg/L		0.02	0.005	GES	12/17/2018 16:03	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*

MW-15

Sample Number: 184031-007

Date Collected: 11/28/2018 11:00

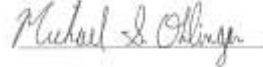
Date Received: 12/3/2018

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Calcium, Ca	119	mg/L		0.1	0.02	GES	12/17/2018 16:08	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

*\*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.*



**Michael Ohlinger, Chemist**

Email [msohlinger@aep.com](mailto:msohlinger@aep.com) Tel.

Fax 614-836-4168 Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Michael Ohlinger (614-836-4184)  
 Contacts: Dave Conover (614-836-4219)

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenny McDonald

Analysis Turnaround Time (In Calendar Days)  
 ☑ Routine (28 days for Monitoring Wells)

Program: Coal Combustion Residuals (CCR)

For Lab Use Only:  
 COC/Order #: **184031**

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sample Specific Notes:					Date
						250 mL bottle, pH<2, HNO3	Field-filter 250 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th*) 1 L bottles, pH<2, HNO3	Mo, Na, Pb, Se, Sr, Tl	
MW-4D	11/28/2018	850	G	GW	7	X				X	
MW-5D	11/28/2018	1135	G	GW	4	X				X	
MW-12D	11/28/2018	1325	G	GW	4	X				X	
DUPLICATE	11/28/2018	850	G	GW	1	X					
EQUIPMENT BLANK	11/28/2018	1500	G	GW	1	X					

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ; F= filter in field  
 \* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: <i>HJM</i>	Company: <b>FAGIF</b>	Date/Time: <b>11/28/18 1400</b>	Received by: <i>[Signature]</i>	Date/Time: <b>12-03-18 11:45</b>
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time:

# Chain of Custody Record

Program: 2nd HALF 2018 DETECTION MONITORING; 2 OF 2

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
**Contacts: Michael Ohlinger (614-836-4184)**  
**Dave Conover (614-836-4219)**

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816

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 #: \_\_\_\_\_

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials				250 mL bottle, pH<2, HNO3	250 mL bottle, pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th) L bottles, pH<2, HNO3	Sample Specific Notes:
MW-3D	11/28/2018	930	G	GW	1									
MW-15	11/28/2018	1100	G	GW	1									

**Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other**; F= filter in field  
 \* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: *Handwritten Signature* Date/Time: 11/29/18 1400  
 Relinquished by: *Handwritten Signature* Date/Time: 12-03-18 11:45  
 Relinquished by: *Handwritten Signature* Date/Time: \_\_\_\_\_



**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>		<u>Delivery Type</u>	
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> PONY	<input checked="" type="radio"/> FedEX
<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> UPS	<input type="radio"/> USPS
Other _____		Other _____	
Plant/Customer <u>Northeastern</u>		Number of Plastic Containers: <u>19</u>	
Opened By <u>SM</u>		Number of Glass Containers: _____	
Date/Time <u>12-03-18 11:45</u>		Number of Mercury Containers: _____	
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: <u>SM</u> on ice / no ice			
(IR Gun Ser# <u>17077903</u> Expir. <u>1-7-19</u> ) - If No, specify each deviation: _____			
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____			
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N Comments _____			
Requested turnaround: <u>Real</u> If RUSH, who was notified? _____			
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: SM 12-03-18

- 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# 184031 Initial & Date & Time : \_\_\_\_\_

Logged by SM Comments: \_\_\_\_\_

Reviewed by MSO \_\_\_\_\_

**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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 39067	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 01/17/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 222034	<b>Collected Date:</b> 01/15/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern P P	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (222034)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24.6	mg/L	0.219	1	EPA 300.0	01/18/2019 18:10		GB
Fluoride	0.370	mg/L	0.083	1	EPA 300.0	01/22/2019 13:45	J	GB
Sulfate	417.6	mg/L	0.140	1:10	EPA 300.0	01/18/2019 18:29		GB

<b>AEP Sample ID</b> : 222035	<b>Collected Date:</b> 01/15/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern P P	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (222035)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24.0	mg/L	0.219	1	EPA 300.0	01/18/2019 18:48		GB
Fluoride	0.316	mg/L	0.083	1	EPA 300.0	01/22/2019 14:03	J	GB
Sulfate	127.6	mg/L	0.140	1:10	EPA 300.0	01/18/2019 19:06		GB

<b>AEP Sample ID</b> : 222036	<b>Collected Date:</b> 01/15/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern P P	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (222036)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	14.6	mg/L	0.219	1	EPA 300.0	01/18/2019 19:25		GB
Fluoride	2.028	mg/L	0.083	1	EPA 300.0	01/19/2019 14:22		GB
Sulfate	437.4	mg/L	0.140	1:100	EPA 300.0	01/18/2019 20:20		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
502 North Allen Ave.  
Shreveport, LA 71101  
Phone: (318) 673-3802  
Fax: (318) 673-3960

<b>Report ID</b> : 39067	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 01/17/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 222037	<b>Collected Date:</b> 01/15/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> Duplicate	<b>Location:</b> Northeastern P P	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (222037)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24.5	mg/L	0.219	1	EPA 300.0	01/18/2019 20:22		GB
Fluoride	0.335	mg/L	0.083	1	EPA 300.0	01/19/2019 14:41	J	GB
Sulfate	470.5	mg/L	0.140	1:10	EPA 300.0	01/18/2019 20:41		GB

Quality Control Data												
* Quality control units are the same as reported analytical results												
Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
1/18/2019	Chloride	221959	<0.219	20	20	100.0	20	20	100.0		0.0	GB
1/18/2019	Chloride		<0.219	20	20	100.0						GB
1/18/2019	Chloride		<0.219	20	19	95.0						GB
1/18/2019	Chloride		<0.219									GB
1/22/2019	Fluoride	222046		10	10	100.0					0.0	GB
1/22/2019	Fluoride		<0.083									
1/18/2019	Sulfate	221959	<0.140	20	19	95.0	20	21	105.0		0.0	GB
1/18/2019	Sulfate		<0.140	20	19	95.0						GB
1/18/2019	Sulfate		<0.140									GB

**Code Code Description**

J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).

*Sandra L. Wallace*  
Laboratory Manager

28-Jan-19  
Report Date

# Chain of Custody Record

JOB 1-18-19

**Shreveport Chemical Laboratory (SCL)**  
 502 N. Allen Ave.  
 Shreveport, LA 71101  
 Jonathan Barnhill (318-673-3803)  
 Contacts: John Davis (318-673-3811)

**Program: Coal Combustion Residuals (CCR)**

Site Contact:

Date:

COC/Order #:

For Lab Use Only:

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenneth McDonald

Analysis Turnaround Time (in Calendar Days)  
 Routine (28 days for Monitoring Wells)

OC# 39067

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes				Sample Specific Notes	
							Mercury	dissolved Fe and Mn	Fluoride, Chloride, Sulfate	Ra-226, Ra-228		
MW-4D	1/15/19	1600	G	GW	1							
MW-5D	1/15/19	1805	G	GW	1							
MW-12D	1/15/19	1520	G	GW	1							
DUPLICATE	1/15/19	1600	G	GW	1							

Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH; 6= Other	F= Filter in field	4	F4	1	4		
* Six 1L Bottles must be collected for Radium for every 10th sample.							

Special Instructions/QC Requirements & Comments:

Relinquished by: <i>KSPM</i>	Company: <i>EAGLE</i>	Date/Time: <i>01/17/19 1519</i>	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Date/Time: <i>1/17/19 15:24</i>



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
 Shreveport, LA 71101  
 Phone 318-673-3802  
 FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input type="radio"/> Walk in	<input checked="" type="radio"/> Shuttle
Other _____					Other _____				
Tracking # _____									

Client Jill Parker-Witt  
 Received By STD  
 Received Date 1/17/19  
 Open Date \_\_\_\_\_

Sample Matrix  
 DGA     PCB Oil     Water     Oil     Soil  
 Solid     Liquid    Other \_\_\_\_\_

Container Temp    Read 0  
Thermometer Serial #F04103  
 Correction Factor +1.2  
 Corrected Temp 1.2

Project I.D. 39067

Were samples received on ice?  YES     NO

Did container arrive in good condition?     YES     NO  
 Was sample documentation received?     YES     NO  
 Was documentation filled out properly?     YES     NO  
 Were samples labeled properly?     YES     NO  
 Were correct containers used?     YES     NO  
 Were the pH's of samples appropriately checked?    YES     NO N/A  
 Total number of sample containers    4

Was any corrective action taken?     NO    Person Contacted Jill Parker-Witt  
 Date & Time 1-21-19 9:30  
S.C.W.

Comments The sample collection date was corrected by Kerry McDonald on 1/21/19.



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

### Water Analysis

**Location: Northeastern Station**

**Report Date: 2/6/2019**

**MW-4D**  
Sample Number: 190230-001      Date Collected: 01/15/2019 16:00      Date Received: 1/21/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.16	mg/L		0.02	0.005	GES	02/05/2019 17:07	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	183	mg/L		0.1	0.02	GES	02/05/2019 17:07	EPA 200.8-1994, Rev. 5.4

**MW-5D**  
Sample Number: 190230-002      Date Collected: 01/15/2019 18:05      Date Received: 1/21/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.540	mg/L		0.005	0.0009	GES	02/04/2019 17:17	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	157	mg/L		0.02	0.003	GES	02/04/2019 17:17	EPA 200.8-1994, Rev. 5.4

**MW-12D**  
Sample Number: 190230-003      Date Collected: 01/15/2019 15:20      Date Received: 1/21/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	9.08	mg/L		0.02	0.005	GES	02/05/2019 17:12	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	68.0	mg/L		0.1	0.02	GES	02/05/2019 17:12	EPA 200.8-1994, Rev. 5.4

**Equipment Blank**  
Sample Number: 190230-004      Date Collected: 01/15/2019 16:00      Date Received: 1/21/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.048	mg/L		0.005	0.0009	GES	02/04/2019 17:27	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.01	mg/L	J	0.02	0.003	GES	02/04/2019 17:27	EPA 200.8-1994, Rev. 5.4

**Duplicate**  
Sample Number: 190230-005      Date Collected: 01/15/2019 18:10      Date Received: 1/21/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.12	mg/L		0.005	0.0009	GES	02/04/2019 17:32	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	201	mg/L		0.02	0.003	GES	02/04/2019 17:32	EPA 200.8-1994, Rev. 5.4

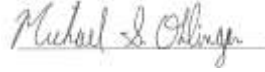
**Location: Northeastern Station**

**Report Date: 2/6/2019**

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Ice was present in all samples upon arrival due to outside temperatures.



**Michael Ohlinger, Chemist**

Email [msohlinger@aep.com](mailto:msohlinger@aep.com)

Tel.

Fax 614-836-4168

Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# Chain of Custody Record

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
**Michael Ohlinger (614-836-4184)**  
**Contacts: Dave Conover (614-836-4219)**

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816

Sampler(s): Kenny McDonald

## Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

COC/Order #:

Analysis Turnaround Time (in Calendar Days)  
 (6 Routine (28 days for Monitoring Wells))

250 mL bottle, pH<2, HNO3  
 Field-filter 250 mL bottle, then pH<2, HNO3  
 1 L bottle, Cool, 0-6C  
 Three (six every 10th\*) L bottles, pH<2, HNO3

Boron, Calcium  
 TDS, F, Cl, SO4  
 Ra-226, Ra-228

Samplers' Initials

Mo, Na, Pb, Se, Sr, Tl  
 Co, Fe, K, Li, Mg, Mn  
 Ba, Be, Ca, Cd, Cr, Dissolved B, Sb, As

X  
 X  
 X  
 X  
 X

Sample Identification

MW-4D  
 MW-5D  
 MW-12D  
 DUPLICATE  
 EQUIPMENT BLANK

Sample Date

Sample Time

Sample Type (C=Comp, G=Grab)

Matrix

# of Cont.

1/15/2019 1600 G GW 1

1/15/2019 1805 G GW 1

1/15/2019 1520 G GW 1

1/15/2019 1600 G GW 1

1/15/2019 1810 G W 1

Preservation Used: 1 = Ice, 2 = HCl; 3 = H2SO4; 4 = HNO3; 5 = NaOH; 6 = Other

\* Six 1L Bottles must be collected for Radium for every 10th sample.

### Special Instructions/QC Requirements & Comments:

Relinquished by: *Kenny*  
 Relinquished by: *EAGLE*  
 Relinquished by: *Michael Ohlinger*

Date/Time: 01/17/19 1400  
 Date/Time:  
 Date/Time:

Received by:  
 Received by:  
 Received in laboratory by: *Michael Ohlinger*

Date/Time:  
 Date/Time:  
 Date/Time: 1/21/19 12:30 PM



**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>		<u>Delivery Type</u>	
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> PONY	<input type="radio"/> UPS
<input type="radio"/> Bag	<input type="radio"/> Envelope	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS
Other _____		Other _____	

Plant/Customer <u>Northeastern</u>	Number of Plastic Containers: <u>5</u>			
Opened By <u>Mso</u>	Number of Glass Containers: _____			
Date/Time <u>1/21/19 12:30pm</u>	Number of Mercury Containers: _____			
Were all temperatures within 0-6°C? Y / N or <input checked="" type="radio"/> N/A Initial: _____ on ice / <input checked="" type="radio"/> no ice (IR Gun Ser# <u>181775172</u> , Expir. <u>10-18-20</u> ) - If No, specify each deviation: _____				
Was container in good condition? <input checked="" type="radio"/> Y / N Comments _____				
Was Chain of Custody received? <input checked="" type="radio"/> Y / N Comments _____				
Requested turnaround: <u>28 days</u> If RUSH, who was notified? _____				
pH (15 min)	Cr <sup>6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: Mso 1/21/19

- 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# 190230 Initial & Date & Time : \_\_\_\_\_

Logged by Mso Comments: Due to current weather, samples were partially frozen upon arrival.

Reviewed by [Signature]

**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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 39317	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 02/28/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 223097	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-2D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223097)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000028	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 12:10		LNM

<b>Water (223097)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	1218	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD

<b>AEP Sample ID</b> : 223098	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-3D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223098)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 12:27	U	LNM

<b>Water (223098)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	700	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD

<b>AEP Sample ID</b> : 223099	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223099)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 12:29	U	LNM

<b>Water (223099)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	696	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 39317	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 02/28/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 223100	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-5D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223100)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 13:35	U	LNM

<b>Water (223100)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	616	mg/L	2	1	SM 2540 C-2011	03/02/2019 16:00		JTD

<b>AEP Sample ID</b> : 223101	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-6D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223101)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000115	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 13:38		LNM

<b>Water (223101)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	1144	mg/L	2	1	SM 2540 C-2011	03/02/2019 16:00		JTD

<b>AEP Sample ID</b> : 223102	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-7D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223102)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000006	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 13:41	J	LNM

<b>Water (223102)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	4500	mg/L	2	1	SM 2540 C-2011	03/02/2019 16:00		JTD



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 39317	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 02/28/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 223103	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-8D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223103)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 13:44	U	LNM

<b>Water (223103)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	17128	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD

<b>AEP Sample ID</b> : 223104	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-9D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223104)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000019	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 13:47	J	LNM

<b>Water (223104)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	1174	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD

<b>AEP Sample ID</b> : 223105	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-12D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223105)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 13:50	U	LNM

<b>Water (223105)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	1014	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 39317	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 02/28/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 223106	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-15	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223106)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	0.000007	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 13:53	J	LNM

<b>Water (223106)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	1046	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD

<b>AEP Sample ID</b> : 223107	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> Duplicate Landfill	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223107)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 14:02	U	LNM

<b>Water (223107)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	1072	mg/L	2	1	SM 2540 C-2011	03/02/2019 14:02		JTD

<b>AEP Sample ID</b> : 223108	<b>Collected Date:</b> 02/27/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> Equipment Blank Landfill	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

<b>Metals (223108)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Mercury	< 0.000005	mg/L	0.000005	1	EPA 7470A 1994	03/06/2019 14:21	U	LNM



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 39317	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 02/28/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

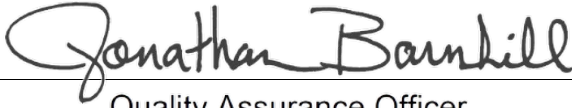
### Quality Control Data

\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
3/6/2019	Mercury	223139.2	<0.00000	0.001	0.0008521	85.2	0.001	0.000892	89.2		2.0	LNM
3/6/2019	Mercury	223107.2	<0.00000	0.001	0.00097	97.0	0.001	0.0009418	94.2		3.4	LNM
3/6/2019	Mercury	223097.2	<0.00000	0.001	0.00097	97.0	0.001	0.0008259	82.6		2.5	LNM
3/2/2019	Solids, Total Dissolved (TDS)	223111	<2	99.33	100	100.7	2806	2794	99.6		3.2	JTD
3/2/2019	Solids, Total Dissolved (TDS)	223110	<2	99.33	98	98.7	2806	2766	98.6		3.4	JTD

**Code Code Description**

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- U Analyte concentration below MDL.

  
 \_\_\_\_\_  
 Quality Assurance Officer

15-Apr-19  
 Report Date

Shreveport Chemical Laboratory (SCL)  
502 N. Allen Ave.  
Shreveport, LA 71101  
Jonathan Barnhill (318-673-3803)  
Contacts: John Davis (318-673-3811)

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

For Lab Use Only:

COC/Order #

Project Name: Northeastern PP CCR  
Contact Name: Jill Parker-Witt  
Contact Phone: 318-673-3816  
Sampler(s): Kenneth McDonald

Analysis Turnaround Time (in Calendar Days)  
Routine (28 days for Monitoring Wells)

COC/Order #: *39317*

*S.M. 2-28-19*

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Analytes				Sample Specific Notes	
							Mercury	Field-filter 250 mL bottle, then pH<2, HNO3	TDS	Three (six every 10th) L bottles, pH<2, HNO3		
MMW-2D	2/27/2019	1200	G	GW	2		X		X			223097.1 - 223097.2
MMW-3D	2/27/2019	900	G	GW	2		X		X			223098.1 - 223098.2
MMW-4D	2/27/2019	835	G	GW	2		X		X			223099.1 - 223099.2
MMW-5D	2/27/2019	1225	G	GW	2		X		X			223100.1 - 223100.2
MMW-6D	2/27/2019	1000	G	GW	2		X		X			223101.1 - 223101.2
MMW-7D	2/27/2019	810	G	GW	2		X		X			223102.1 - 223102.2
MMW-8D	2/27/2019	1350	G	GW	2		X		X			223103.1 - 223103.2
MMW-9D	2/27/2019	1022	G	GW	2		X		X			223104.1 - 223104.2
MMW-12D	2/27/2019	1325	G	GW	2		X		X			223105.1 - 223105.2
MMW-15	2/27/2019	1120	G	GW	2		X		X			223106.1 - 223106.2
DUPLICATE LANDFILL	2/27/2019	835	G	GW	2		X		X			223107.1 - 223107.2
EQUIPMENT BLANK LANDFILL	2/27/2019	1340	G	W	1		X					223108

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: *[Signature]* Company: *Enbridge* Date/Time: *02/28/19 1555* Received by: *[Signature]* Date/Time: *2/28/19 15:55*

Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 11/01/17



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

Container Type					Delivery Type				
<input checked="" type="radio"/> Ice Chest	<input type="radio"/> Bag	<input type="radio"/> Action Pak	<input type="radio"/> PCB Mailer	<input type="radio"/> Bottle	<input type="radio"/> UPS	<input type="radio"/> FEDEX	<input type="radio"/> US Mail	<input checked="" type="radio"/> Walk in	<input type="radio"/> Shuttle
Other _____					Other _____				
					Tracking # _____				

Client Jill Parker - With  
 Received By STW  
 Received Date 2/28/19  
 Open Date \_\_\_\_\_

Sample Matrix  
 DGA     PCB Oil     Water     Oil     Soil  
 Solid     Liquid     Other \_\_\_\_\_

Container Temp    Read 8  
Thermometer Serial #F04103  
 Correction Factor 7.2  
 Corrected Temp 4.2

Project I.D. 39317

Were samples received on ice?  YES     NO

Did container arrive in good condition?  YES     NO

Was sample documentation received?  YES     NO

Was documentation filled out properly?  YES     NO

Were samples labeled properly?  YES     NO

Were correct containers used?  YES     NO

Were the pH's of samples appropriately checked?  YES     NO

Total number of sample containers 23

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_  
 Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_







Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

### Water Analysis

**Location: Northeastern Station**

**Report Date: 4/15/2019**

#### MW-2D

**Sample Number: 190787-001**                      **Date Collected: 02/27/2019 12:00**                      **Date Received: 3/5/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	16.4	mg/L		0.1	0.03	CRJ	03/22/2019 09:54	EPA 300.1-1997, Rev. 1.0
Fluoride, F	1.56	mg/L		0.2	0.04	CRJ	03/22/2019 09:54	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	612	mg/L		10	2	CRJ	03/21/2019 05:09	EPA 300.1-1997, Rev. 1.0

#### MW-3D

**Sample Number: 190787-002**                      **Date Collected: 02/27/2019 09:00**                      **Date Received: 3/5/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	13.2	mg/L		0.1	0.03	CRJ	03/21/2019 20:53	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.71	mg/L		0.2	0.04	CRJ	03/21/2019 20:53	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	223	mg/L		10	2	CRJ	03/21/2019 05:32	EPA 300.1-1997, Rev. 1.0

#### MW-4D

**Sample Number: 190787-003**                      **Date Collected: 02/27/2019 08:35**                      **Date Received: 3/5/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	31.2	mg/L		0.1	0.03	MGK	03/21/2019 13:13	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.30	mg/L		0.2	0.04	MGK	03/21/2019 13:13	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	463	mg/L		10	2	CRJ	03/21/2019 05:55	EPA 300.1-1997, Rev. 1.0

#### MW-5D

**Sample Number: 190787-004**                      **Date Collected: 02/27/2019 12:25**                      **Date Received: 3/5/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	26.7	mg/L		0.1	0.03	MGK	03/21/2019 13:59	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.50	mg/L		0.2	0.04	MGK	03/21/2019 13:59	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	153	mg/L		10	2	CRJ	03/21/2019 06:17	EPA 300.1-1997, Rev. 1.0

**MW-6D**

Sample Number: 190787-005

Date Collected: 02/27/2019 10:00

Date Received: 3/5/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	26.9	mg/L		0.1	0.03	MGK	03/21/2019 14:22	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.89	mg/L		0.2	0.04	MGK	03/21/2019 14:22	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	496	mg/L		10	2	CRJ	03/21/2019 07:03	EPA 300.1-1997, Rev. 1.0

**MW-7D**

Sample Number: 190787-006

Date Collected: 02/27/2019 08:10

Date Received: 3/5/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	385	mg/L		1	0.3	CRJ	03/21/2019 07:26	EPA 300.1-1997, Rev. 1.0
Fluoride, F	1.66	mg/L		0.2	0.04	MGK	03/21/2019 14:45	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	2390	mg/L		10	2	CRJ	03/21/2019 07:26	EPA 300.1-1997, Rev. 1.0

**MW-8D**

Sample Number: 190787-007

Date Collected: 02/27/2019 13:50

Date Received: 3/5/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	9650	mg/L		20	8	CRJ	03/21/2019 15:30	EPA 300.1-1997, Rev. 1.0
Fluoride, F	2.28	mg/L		0.8	0.2	CRJ	03/21/2019 15:53	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	43.4	mg/L		5	0.8	CRJ	03/21/2019 15:53	EPA 300.1-1997, Rev. 1.0

**MW-9D**

Sample Number: 190787-008

Date Collected: 02/27/2019 10:22

Date Received: 3/5/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	28.9	mg/L		0.1	0.03	MGK	03/21/2019 16:41	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.89	mg/L		0.2	0.04	MGK	03/21/2019 16:41	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	555	mg/L		10	2	CRJ	03/21/2019 08:15	EPA 300.1-1997, Rev. 1.0

**MW-12D**

Sample Number: 190787-009

Date Collected: 02/27/2019 13:25

Date Received: 3/5/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	16.8	mg/L		0.1	0.03	MGK	03/21/2019 17:04	EPA 300.1-1997, Rev. 1.0
Fluoride, F	2.11	mg/L		0.2	0.04	MGK	03/21/2019 17:04	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	564	mg/L		10	2	CRJ	03/21/2019 09:00	EPA 300.1-1997, Rev. 1.0

MW-15

Sample Number: 190787-010

Date Collected: 02/27/2019 11:20

Date Received: 3/5/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	24.3	mg/L		0.1	0.03	MGK	03/21/2019 17:27	EPA 300.1-1997, Rev. 1.0
Fluoride, F	1.45	mg/L		0.2	0.04	MGK	03/21/2019 17:27	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	574	mg/L		10	2	CRJ	03/21/2019 09:23	EPA 300.1-1997, Rev. 1.0

Duplicate Landfill

Sample Number: 190787-011

Date Collected: 02/27/2019 08:35

Date Received: 3/5/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Chloride, Cl	29.9	mg/L		0.1	0.03	MGK	03/21/2019 18:13	EPA 300.1-1997, Rev. 1.0
Fluoride, F	0.30	mg/L		0.2	0.04	MGK	03/21/2019 18:13	EPA 300.1-1997, Rev. 1.0
Sulfate, SO4	462	mg/L		10	2	CRJ	03/21/2019 09:46	EPA 300.1-1997, Rev. 1.0

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Michael Ohlinger, Chemist

Email msohlinger@aep.com

Tel.

Fax 614-836-4168

Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Michael Ohlinger (614-836-4184)  
 Dave Canover (614-836-4219)

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816  
 Sampler(s): Kenny McDonald

Site Contact: \_\_\_\_\_ Date: \_\_\_\_\_ For Lab Use Only:  
 COC/Order #: \_\_\_\_\_  
 190787

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				Sample Specific Notes:	
						Boron, Calcium	Dissolved B, Sb, As, Ba, Be, Ca, Cd, Cr, Co, Fe, K, Li, Mg, Mn, Mo, Na, Pb, Se, Sr, Tl	Field-filter 250 mL bottle, then pH<2, HNO3	250 mL bottle, then pH<2, HNO3		250 mL bottle, Cool, 0-6C
MW-2D	2/27/2019	1200	G	GW	1			X			
MW-3D	2/27/2019	900	G	GW	1			X			
MW-4D	2/27/2019	835	G	GW	1			X			
MW-5D	2/27/2019	1225	G	GW	1			X			
MW-6D	2/27/2019	1000	G	GW	1			X			
MW-7D	2/27/2019	810	G	GW	1			X			
MW-8D	2/27/2019	1350	G	GW	1			X			
MW-9D	2/27/2019	1022	G	GW	1			X			
MW-12D	2/27/2019	1325	G	GW	1			X			
MW-15	2/27/2019	1120	G	GW	1			X			
DUPLICATE LANDFILL	2/27/2019	835	G	GW	1			X			
						4	F4	1	4		

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other \_\_\_\_\_; F= filter in field  
 \* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: *PAW* Date/Time: 03/04/19 1400 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received by: *Kenny McDonald* Date/Time: 3/5/19 11:50 am

**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<p><u>Package Type</u></p> <p><input checked="" type="radio"/> Cooler    <input type="radio"/> Box    <input type="radio"/> Bag    <input type="radio"/> Envelope</p>	<p><u>Delivery Type</u></p> <p>PONY    UPS    <input checked="" type="radio"/> FedEx    USPS</p> <p>Other _____</p>			
Plant/Customer <u>Northeastern</u>	Number of Plastic Containers: <u>11</u>			
Opened By <u>MSO/SWB</u>	Number of Glass Containers: <u>-</u>			
Date/Time <u>3/5/19 11:50Am</u>	Number of Mercury Containers: <u>-</u>			
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / N or N/A    Initial: <u>MSO</u> on <input checked="" type="radio"/> ice / no ice (IR Gun Ser# <u>181354432</u> , Expir. <u>06-12-20</u> ) - If No, specify each deviation: _____				
Was container in good condition? <input checked="" type="radio"/> Y / N    Comments _____				
Was Chain of Custody received? <input checked="" type="radio"/> Y / N    Comments _____				
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____				
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: MSO/SWB 3/5/19

- 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# 190787    Initial & Date & Time: \_\_\_\_\_

Logged by MSO    Comments: \_\_\_\_\_

Reviewed by MBK    \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**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.



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

**Water Analysis**

**Location: Northeastern Station**

**Report Date: 4/15/2019**

**MW-2D**  
**Sample Number: 190825-001**                      **Date Collected: 02/27/2019 12:00**                      **Date Received: 3/7/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	9.67	mg/L		0.02	0.005	GES	04/04/2019 14:38	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	9.26	mg/L		0.1	0.02	GES	04/04/2019 14:38	EPA 200.8-1994, Rev. 5.4

Laboratory Fortified Blank and Laboratory Fortified Blank Duplicate relative percent difference was greater than the quality control limit of 10%.

**MW-3D**  
**Sample Number: 190825-002**                      **Date Collected: 02/27/2019 09:00**                      **Date Received: 3/7/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.973	mg/L		0.02	0.005	GES	04/04/2019 14:43	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	127	mg/L		0.1	0.02	GES	04/04/2019 14:43	EPA 200.8-1994, Rev. 5.4

Laboratory Fortified Blank and Laboratory Fortified Blank Duplicate relative percent difference was greater than the quality control limit of 10%.

**MW-4D**  
**Sample Number: 190825-003**                      **Date Collected: 02/27/2019 08:35**                      **Date Received: 3/7/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.42	mg/L		0.02	0.005	GES	04/04/2019 14:48	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	187	mg/L		0.1	0.02	GES	04/04/2019 14:48	EPA 200.8-1994, Rev. 5.4

Laboratory Fortified Blank and Laboratory Fortified Blank Duplicate relative percent difference was greater than the quality control limit of 10%.

**MW-5D**  
**Sample Number: 190825-004**                      **Date Collected: 02/27/2019 12:25**                      **Date Received: 3/7/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.531	mg/L		0.02	0.005	GES	04/04/2019 14:53	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	130	mg/L		0.1	0.02	GES	04/04/2019 14:53	EPA 200.8-1994, Rev. 5.4

Laboratory Fortified Blank and Laboratory Fortified Blank Duplicate relative percent difference was greater than the quality control limit of 10%.

**MW-6D**  
**Sample Number: 190825-005**                      **Date Collected: 02/27/2019 10:00**                      **Date Received: 3/7/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	3.63	mg/L		0.02	0.005	GES	04/04/2019 14:58	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	360	mg/L		0.1	0.02	GES	04/04/2019 14:58	EPA 200.8-1994, Rev. 5.4

Laboratory Fortified Blank and Laboratory Fortified Blank Duplicate relative percent difference was greater than the quality control limit of 10%.

**MW-7D**

Sample Number: 190825-006

Date Collected: 02/27/2019 08:10

Date Received: 3/7/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.00	mg/L		0.02	0.005	GES	04/04/2019 15:03	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	185	mg/L		0.1	0.02	GES	04/04/2019 15:03	EPA 200.8-1994, Rev. 5.4

Laboratory Fortified Blank and Laboratory Fortified Blank Duplicate relative percent difference was greater than the quality control limit of 10%.

**MW-8D**

Sample Number: 190825-007

Date Collected: 02/27/2019 13:50

Date Received: 3/7/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.62	mg/L		0.02	0.005	GES	04/04/2019 15:08	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	788	mg/L		0.1	0.02	GES	04/04/2019 15:08	EPA 200.8-1994, Rev. 5.4

Laboratory Fortified Blank and Laboratory Fortified Blank Duplicate relative percent difference was greater than the quality control limit of 10%.

**MW-9D**

Sample Number: 190825-008

Date Collected: 02/27/2019 10:22

Date Received: 3/7/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	6.49	mg/L		0.1	0.02	CTK	04/05/2019 12:02	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	155	mg/L		0.4	0.06	CTK	04/05/2019 12:02	EPA 200.8-1994, Rev. 5.4

**MW-12D**

Sample Number: 190825-009

Date Collected: 02/27/2019 13:25

Date Received: 3/7/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	8.88	mg/L		0.1	0.02	CTK	04/05/2019 12:07	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	64.7	mg/L		0.4	0.06	CTK	04/05/2019 12:07	EPA 200.8-1994, Rev. 5.4

**MW-15**

Sample Number: 190825-010

Date Collected: 02/27/2019 11:20

Date Received: 3/7/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	8.34	mg/L		0.1	0.02	CTK	04/05/2019 12:12	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	96.9	mg/L		0.4	0.06	CTK	04/05/2019 12:12	EPA 200.8-1994, Rev. 5.4

**Duplicate Landfill**

Sample Number: 190825-011

Date Collected: 02/27/2019 08:35

Date Received: 3/7/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.45	mg/L		0.02	0.005	GES	04/04/2019 17:21	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	198	mg/L		0.1	0.02	GES	04/04/2019 17:21	EPA 200.8-1994, Rev. 5.4



Equipment Blank Landfill

Sample Number: 190825-012

Date Collected: 02/27/2019 13:40

Date Received: 3/7/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.006	mg/L		0.005	0.0009	CTK	04/05/2019 11:57	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.01	mg/L	J	0.02	0.003	CTK	04/05/2019 11:57	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.



Michael Ohlinger, Chemist

Email msohlinger@aep.com Tel.

Fax 614-836-4168 Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# Chain of Custody Record

Program: Coal Combustion Residuals (CCR)

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
**Contacts: Michael Ohlinger (614-836-4184)**  
**Dave Conover (614-836-4219)**

Project Name: Northeastern PP CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816

Sampler(s): Kenny McDonald

<b>Site Contact:</b>	<b>Date:</b>	<b>For Lab Use Only:</b>	
		<b>COC/Order #:</b>	190825

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				Field-filter 250 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th*) L bottles, pH<2, HNO3	Date
						Boron, Calcium	TDS, F, Cl, SO4	Mo, Na, Pb, Se, Sr, Ti	Co, Fe, K, Li, Mg, Mn				
MW-2D	2/27/2019	1200	G	GW	1			X					
MW-3D	2/27/2019	900	G	GW	1			X					
MW-4D	2/27/2019	835	G	GW	1			X					
MW-5D	2/27/2019	1225	G	GW	1			X					
MW-6D	2/27/2019	1000	G	GW	1			X					
MW-7D	2/27/2019	810	G	GW	1			X					
MW-8D	2/27/2019	1350	G	GW	1			X					
MW-9D	2/27/2019	1022	G	GW	1			X					
MW-12D	2/27/2019	1325	G	GW	1			X					
MW-15	2/27/2019	1120	G	GW	1			X					
DUPLICATE LANDFILL	2/27/2019	835	G	GW	1			X					
EQUIPMENT BLANK LANDFILL	2/27/2019	1340	G	W	1			X					
<b>Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other</b>						4	F4	1	4				

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: <i>Kenny McDonald</i>	Company: <i>PAGIT</i>	Date/Time: <i>03/07/19 1400</i>	Received by:
Relinquished by:	Company:	Date/Time:	Received by:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>[Signature]</i>
			Date/Time: <i>03/07/19 11:40</i>



**WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>				<u>Delivery Type</u>			
Cooler	Box	Bag	Envelope	PONY	UPS	FedEX	USPS
				Other _____			
Plant/Customer <u>Midwestern PPC</u>				Number of Plastic Containers: <u>12</u>			
Opened By <u>Mishna</u>				Number of Glass Containers: <u>2</u>			
Date/Time <u>03/07/19 11:40</u>				Number of Mercury Containers: <u>0</u>			
Were all temperatures within 0-6°C? Y / N or <u>N/A</u> Initial: <u>MLK</u> on ice / <u>no ice</u> (IR Gun Ser# <u>18135443</u> Expir. <u>6-12-20</u> ) - If No, specify each deviation: _____							
Was container in good condition? <u>Y</u> / N Comments _____							
Was Chain of Custody received? <u>Y</u> / N Comments _____							
Requested turnaround: <u>Rush</u> If RUSH, who was notified? _____							
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: MLK 03/07/19

- 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# 190825 Initial & Date & Time : \_\_\_\_\_

Logged by SM Comments: \_\_\_\_\_

Reviewed by MSO \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
 502 North Allen Ave.  
 Shreveport, LA 71101  
 Phone: (318) 673-3802  
 Fax: (318) 673-3960

<b>Report ID</b> : 39755	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 05/09/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 225074	<b>Collected Date:</b> 05/07/2019	<b>By:</b> KM
<b>Cust Sample ID:</b> MW-6D	<b>Location:</b> Northeastern Power Plant	<b>Matrix:</b> Water
<b>Sample Desc.:</b> Coal Combustion Residuals (CCR)		

Water (225074)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Solids, Total Dissolved (TDS)	1038	mg/L	2	1	SM 2540 C-2011	05/13/2019 16:50		GB

Quality Control Data											
* Quality control units are the same as reported analytical results											

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
5/13/2019	Solids, Total Dissolved (TDS)	225129		1000	876	87.6	2880	2787	96.8		14.9	GB
5/13/2019	Solids, Total Dissolved (TDS)		<2									GB

\_\_\_\_\_  
 Quality Assurance Officer

05-Jun-19  
 \_\_\_\_\_  
 Report Date

Shreveport Chemical Laboratory (SCL)  
502 N. Allen Ave.  
Shreveport, LA 71101  
Jonathan Barnhill (318-673-3803)  
Contacts: John Davis (318-673-3811)

Chain of Custody Record  
Program: 2 of 2 Sampling  
Date: 5/10/19

Project Name: Northeastern PP  
Contact Name: Jill Parker-Witt  
Contact Phone: 318-673-3816  
Sampler(s): Kenneth McDonald  
Analysis Turnaround Time (in Calendar Days)  
 Routine (28 days for Monitoring Wells)  
Site Contact: \_\_\_\_\_ Date: \_\_\_\_\_  
For Lab Use Only:  
COC/Order #: **COC # 39755**  
Sample Specific Notes: \_\_\_\_\_

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	Mercury 250 mL bottle, pH<2, HNO3	Field-filter 500 mL bottle, then pH<2, HNO3	TDS 250 mL bottle, Cool, 0-6C	Ra-226, Ra-228 Three (six every 10th) 1 L bottles, pH<2, HNO3
MMW-6D	5/7/2019	1155	G	GW	1				X	4

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other \_\_\_\_\_ ; F= filter in field  
\* Six 1L Bottles must be collected for Radium for every 10th sample.  
Special Instructions/QC Requirements & Comments:  
Relinquished by: **KPM** Company: **CAOIT** Date/Time: **05/09/19 0856** Received by: **SS** Date/Time: \_\_\_\_\_  
Relinquished by: \_\_\_\_\_ Company: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received in Laboratory by: **Parsha Walker** Date/Time: **5-9-19 9:00**  
Form COC-04, AEP Chain of Custody (COC) Record for Coal Combustion Residual (CCR) Sampling - Shreveport, Rev. 1, 1/10/17



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

### PROJECT RECEIPT FORM

<b>Container Type</b> <input checked="" type="radio"/> Ice Chest    Bag    Action Pak    PCB Mailer <input checked="" type="radio"/> Bottle Other _____	<b>Delivery Type</b> UPS    FEDEX    US Mail    Walk in <input checked="" type="radio"/> Shuttle Other _____
Tracking # _____	

Client Jill Witt Northern  
Received By Sandra Walker  
Received Date 5-9-19  
Open Date \_\_\_\_\_

**Sample Matrix**  
DGA    PCB Oil     Water    Oil    Soil  
Solid    Liquid    Other \_\_\_\_\_

Container Temp    Read 0  
Correction Factor    Thermometer Serial #F04103 1.2  
Corrected Temp    1.2

Project I.D. 39755

Were samples received on ice?  YES    NO

- Did container arrive in good condition?  YES    NO
- Was sample documentation received?  YES    NO
- Was documentation filled out properly?  YES    NO
- Were samples labeled properly?  YES    NO
- Were correct containers used?  YES    NO
- Were the pH's of samples appropriately checked? YES     NO N/A
- Total number of sample containers    1

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_  
Date & Time \_\_\_\_\_

Comments \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

### Water Analysis

**Location: Northeastern Station**

**Report Date: 6/13/2019**

**MW-3D**  
Sample Number: 191627-001      Date Collected: 05/07/2019 11:20      Date Received: 5/10/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.56	mg/L		0.05	0.009	GES	06/04/2019 15:26	EPA 200.8-1994, Rev. 5.4

**MW-4D**  
Sample Number: 191627-002      Date Collected: 05/07/2019 10:45      Date Received: 5/10/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Sulfate, SO4	419	mg/L		10	2	CRJ	05/21/2019 18:07	EPA 300.1-1997, Rev. 1.0

**MW-5D**  
Sample Number: 191627-003      Date Collected: 05/07/2019 12:30      Date Received: 5/10/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Sulfate, SO4	158	mg/L		10	2	CRJ	05/21/2019 18:26	EPA 300.1-1997, Rev. 1.0

**MW-6D**  
Sample Number: 191627-004      Date Collected: 05/07/2019 11:55      Date Received: 5/10/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Calcium, Ca	185	mg/L		0.2	0.03	GES	06/04/2019 15:31	EPA 200.8-1994, Rev. 5.4

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit  
J: Analyte was positively identified, though the quantitation was below Reporting Limit.

**Michael Ohlinger, Chemist**  
Email [msohlinger@aep.com](mailto:msohlinger@aep.com) Tel.  
Fax 614-836-4168 Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# Chain of Custody Record

Dolan Chemical Laboratory (DCL)  
 4001 Bixby Road  
 Groveport, Ohio 43125  
**Contacts:** *Michael Ohlinger (614-836-4184)*  
*Dave Conover (614-836-4219)*

Project Name: Northeastern PP  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816

Sampler(s): Kenny McDonald

**Sample Identification**

MW-3D	5/7/2019	1120	G	GW	1
MW-4D	5/7/2019	1045	G	GW	1
MW-5D	5/7/2019	1230	G	GW	1
MW-6D	5/7/2019	1155	G	GW	1

Analysis Turnaround Time (in Calendar Days)  
 Routine (28 days for Monitoring Wells)

**Program: 2 of 2 Sampling**

Site Contact:

For Lab Use Only:

250 mL bottle, pH<2, HNO3	250 mL bottle, pH<2, HNO3	250 mL bottle, Cool, 0-8C	Three (six every 10th*) 1 L bottles, pH<2, HNO3
			191627

Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix		# of Cont.	Sampler(s) Initials	Boron	Calcium	Sulfate	Date	COC/Order #
			C	G							
5/7/2019	1120	G		GW	1	X					
5/7/2019	1045	G		GW	1		X				
5/7/2019	1230	G		GW	1		X				
5/7/2019	1155	G		GW	1		X				

**Preservation Used:** 1 = Ice, 2 = HCl; 3 = H2SO4; 4 = HNO3; 5 = NaOH; 6 = Other ; F = filter in field  
 \* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

Relinquished by: <i>L. W. ...</i>	Company: <i>PAULT</i>	Date/Time: <i>05/09/19 1400</i>	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: <i>S. J. ...</i>	Date/Time: <i>5-10-19 10:30</i>



**AEP WATER & WASTE SAMPLE RECEIPT FORM**

<u>Package Type</u>		<u>Delivery Type</u>	
<input checked="" type="radio"/> Cooler	Box    Bag    Envelope	PONY    UPS <input checked="" type="radio"/> FedEx	USPS
Other _____		Other _____	
Plant/Customer <u>Northeastern</u>		Number of Plastic Containers: <u>4</u>	
Opened By <u>MSO 5/10/19</u>		Number of Glass Containers: _____	
Date/Time <u>5/10/19 10:35 AM</u>		Number of Mercury Containers: _____	
Were all temperatures within 0-6°C? <input checked="" type="radio"/> Y / <input type="radio"/> N or N/A    Initial: <u>MSO</u> <input checked="" type="radio"/> on ice / no ice (IR Gun Ser# <u>181354432</u> , Expir. <u>06-12-20</u> ) - If No, specify each deviation: _____			
Was container in good condition? <input checked="" type="radio"/> Y / <input type="radio"/> N    Comments _____			
Was Chain of Custody received? <input checked="" type="radio"/> Y / <input type="radio"/> N    Comments _____			
Requested turnaround: <u>Routine</u> If RUSH, who was notified? _____			
pH (15 min)	Cr <sup>+6</sup> (pres) (24 hr)	NO <sub>2</sub> or NO <sub>3</sub> (48 hr)	ortho-PO <sub>4</sub> (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: MSO 5/10/19

- 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# 191627    Initial & Date & Time: \_\_\_\_\_

Logged by MSO    Comments: \_\_\_\_\_

Reviewed by SM    \_\_\_\_\_

**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.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 40447	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/29/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960

<b>AEP Sample ID</b> : 228539	<b>Collected Date:</b> 08/26/2019	<b>By:</b> KM/MH
<b>Cust Sample ID:</b> MW-2D	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> CCR		

<b>Water (228539)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	12	mg/L	0.219	1	EPA 300.0	09/01/2019 18:41	M6	GB
Fluoride	1.661	mg/L	0.083	1	EPA 300.0	09/01/2019 18:41		GB
Solids, Total Dissolved (TDS)	1236	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	591	mg/L	0.140	1:10	EPA 300.0	09/01/2019 19:56		GB

<b>AEP Sample ID</b> : 228540	<b>Collected Date:</b> 08/26/2019	<b>By:</b> KM/MH
<b>Cust Sample ID:</b> MW-3D	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> CCR		

<b>Water (228540)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	12	mg/L	0.219	1	EPA 300.0	09/01/2019 21:12	M6	GB
Fluoride	0.608	mg/L	0.083	1	EPA 300.0	09/01/2019 21:12	J	GB
Solids, Total Dissolved (TDS)	686	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30	M6	JTD
Sulfate	181	mg/L	0.140	1:10	EPA 300.0	09/01/2019 21:30		GB

<b>AEP Sample ID</b> : 228541	<b>Collected Date:</b> 08/26/2019	<b>By:</b> KM/MH
<b>Cust Sample ID:</b> MW-4D	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> CCR		

<b>Water (228541)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	23	mg/L	0.219	1	EPA 300.0	09/01/2019 21:49	M6	GB
Fluoride	0.171	mg/L	0.083	1	EPA 300.0	09/01/2019 21:49	J	GB
Solids, Total Dissolved (TDS)	830	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	274	mg/L	0.140	1:10	EPA 300.0	09/01/2019 22:08		GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 40447 <b>Date Received:</b> 08/29/2019	<b>Company:</b> SEP - Environmental (JP-W) <b>Contact:</b> Jill Parker-Witt <b>Phone:</b> (318) 673-3816	<b>Address:</b> 502 N. Allen Avenue Shreveport, LA 71101 <b>Fax:</b> (318) 673-3960
--	--	---

<b>AEP Sample ID</b> : 228542 <b>Cust Sample ID:</b> MW-5D <b>Sample Desc.:</b> CCR	<b>Collected Date:</b> 08/26/2019 <b>Location:</b> Northeastern PP	<b>By:</b> KM/MH <b>Matrix:</b> Water
---	---	--

Water (228542)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24	mg/L	0.219	1	EPA 300.0	09/01/2019 22:26	M6	GB
Fluoride	0.412	mg/L	0.083	1	EPA 300.0	09/01/2019 22:26	J	GB
Solids, Total Dissolved (TDS)	670	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	134	mg/L	0.140	1:10	EPA 300.0	09/01/2019 22:45		GB

<b>AEP Sample ID</b> : 228543 <b>Cust Sample ID:</b> MW-6D <b>Sample Desc.:</b> CCR	<b>Collected Date:</b> 08/26/2019 <b>Location:</b> Northeastern PP	<b>By:</b> KM/MH <b>Matrix:</b> Water
---	---	--

Water (228543)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	13	mg/L	0.219	1	EPA 300.0	09/01/2019 23:04	M6	GB
Fluoride	0.634	mg/L	0.083	1	EPA 300.0	09/01/2019 23:04	J	GB
Solids, Total Dissolved (TDS)	1044	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	401	mg/L	0.140	1:10	EPA 300.0	09/01/2019 23:23		GB

<b>AEP Sample ID</b> : 228544 <b>Cust Sample ID:</b> MW-9D <b>Sample Desc.:</b> CCR	<b>Collected Date:</b> 08/26/2019 <b>Location:</b> Northeastern PP	<b>By:</b> KM/MH <b>Matrix:</b> Water
---	---	--

Water (228544)								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24	mg/L	0.219	1	EPA 300.0	09/11/2019 12:48		GB
Fluoride	0.758	mg/L	0.083	1	EPA 300.0	09/11/2019 12:48	J	GB
Solids, Total Dissolved (TDS)	1084	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	526	mg/L	0.140	1:10	EPA 300.0	09/11/2019 14:40	M6	GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 40447 <b>Date Received:</b> 08/29/2019	<b>Company:</b> SEP - Environmental (JP-W) <b>Contact:</b> Jill Parker-Witt <b>Phone:</b> (318) 673-3816	<b>Address:</b> 502 N. Allen Avenue Shreveport, LA 71101 <b>Fax:</b> (318) 673-3960
--	--	---

<b>AEP Sample ID</b> : 228545 <b>Cust Sample ID:</b> MW-12D <b>Sample Desc.:</b> CCR	<b>Collected Date:</b> 08/26/2019 <b>Location:</b> Northeastern PP	<b>By:</b> KM/MH <b>Matrix:</b> Water
--	---	--

<b>Water (228545)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	14	mg/L	0.219	1	EPA 300.0	09/11/2019 16:14		GB
Fluoride	1.600	mg/L	0.083	1	EPA 300.0	09/11/2019 16:14		GB
Solids, Total Dissolved (TDS)	1018	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	540	mg/L	0.140	1:10	EPA 300.0	09/11/2019 16:33	M6	GB

<b>AEP Sample ID</b> : 228546 <b>Cust Sample ID:</b> MW-14 <b>Sample Desc.:</b> CCR	<b>Collected Date:</b> 08/26/2019 <b>Location:</b> Northeastern PP	<b>By:</b> KM/MH <b>Matrix:</b> Water
---	---	--

<b>Water (228546)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	3117	mg/L	0.219	1:10	EPA 300.0	09/11/2019 18:07		GB
Fluoride	3.066	mg/L	0.083	1:10	EPA 300.0	09/11/2019 18:07		GB
Solids, Total Dissolved (TDS)	6198	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	357	mg/L	0.140	1:10	EPA 300.0	09/11/2019 18:07	M6	GB

<b>AEP Sample ID</b> : 228547 <b>Cust Sample ID:</b> MW-15 <b>Sample Desc.:</b> CCR	<b>Collected Date:</b> 08/26/2019 <b>Location:</b> Northeastern PP	<b>By:</b> KM/MH <b>Matrix:</b> Water
---	---	--

<b>Water (228547)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	20	mg/L	0.219	1	EPA 300.0	09/11/2019 18:25		GB
Fluoride	1.252	mg/L	0.083	1	EPA 300.0	09/11/2019 18:25		GB
Solids, Total Dissolved (TDS)	1072	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	587	mg/L	0.140	1:10	EPA 300.0	09/11/2019 18:44	M6	GB



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

<b>Report ID</b> : 40447	<b>Company:</b> SEP - Environmental (JP-W)	<b>Address:</b> 502 N. Allen Avenue
<b>Date Received:</b> 08/29/2019	<b>Contact:</b> Jill Parker-Witt	Shreveport, LA 71101
	<b>Phone:</b> (318) 673-3816	<b>Fax:</b> (318) 673-3960
<b>AEP Sample ID</b> : 228548	<b>Collected Date:</b> 08/26/2019	<b>By:</b> KM/MH
<b>Cust Sample ID:</b> Duplicate Landfill	<b>Location:</b> Northeastern PP	<b>Matrix:</b> Water
<b>Sample Desc.:</b> CCR		

<b>Water (228548)</b>								
Parameter	Value	Unit	Det. Limit	Dil./Conc.	Method	Analysis Date/Time	Codes	Tech
Chloride	24	mg/L	0.219	1	EPA 300.0	09/11/2019 19:03		GB
Fluoride	0.198	mg/L	0.083	1	EPA 300.0	09/11/2019 19:03	J	GB
Solids, Total Dissolved (TDS)	850	mg/L	2	1	SM 2540 C-2011	08/29/2019 18:30		JTD
Sulfate	276	mg/L	0.140	1:10	EPA 300.0	09/11/2019 20:37	M6	GB

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.



# AEP ANALYTICAL CHEMISTRY SERVICES

## Analysis Report

02004  
**502 North Allen Ave.**  
**Shreveport, LA 71101**  
**Phone: (318) 673-3802**  
**Fax: (318) 673-3960**

**Report ID** : 40447  
**Date Received:** 08/29/2019

**Company:** SEP - Environmental (JP-W)  
**Contact:** Jill Parker-Witt  
**Phone:** (318) 673-3816

**Address:** 502 N. Allen Avenue  
 Shreveport, LA 71101  
**Fax:** (318) 673-3960

### Quality Control Data

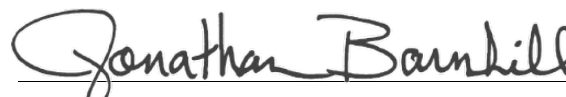
\* Quality control units are the same as reported analytical results

Date	Parameter	Sample ID	Blank Value *	Standard			Spike			Surrogate % Recovery	Duplicate % Difference	Tech
				Value *	Recovery*	%	Value *	Recovery*	%			
9/1/2019	Chloride	228539.1		25	23	92.0	25	33	132.0		0.0	GB
9/1/2019	Chloride		<0.219									GB
9/1/2019	Chloride	228531		25	23	92.0	25	25	100.0		0.0	GB
9/11/2019	Chloride	228544.1		25	23	92.0	25	27	108.0		0.0	GB
9/11/2019	Chloride		<0.219									GB
9/11/2019	Chloride	228548.1		25	23	92.0	25	26	104.0		0.0	GB
9/1/2019	Fluoride		<0.083									GB
9/1/2019	Fluoride	228531		6	5.8	96.7	6	5.9	98.3		0.0	GB
9/1/2019	Fluoride	228539.1		6	5.8	96.7	6	6.1	101.7		0.0	GB
9/11/2019	Fluoride	228548.1		6	5.7	95.0	6	6.4	106.7		0.3	GB
9/11/2019	Fluoride		<0.083									GB
9/11/2019	Fluoride	228544.1		6	5.7	95.0	6	5.8	96.7		2.8	GB
8/29/2019	Solids, Total Dissolved (TDS)	228540.1	<2	50	46	92.0	1008	1166	115.7		2.0	JTD
9/1/2019	Sulfate	228539.1		25	23	92.0	50	59	118.0		0.0	GB
9/1/2019	Sulfate	228531		25	23	92.0	25	27	108.0		2.0	GB
9/1/2019	Sulfate		<0.140									GB
9/11/2019	Sulfate	228544.1		25	23	92.0	50	62	124.0		0.6	GB
9/11/2019	Sulfate	228548.1		25	23	92.0	50	58	116.0		0.0	GB
9/11/2019	Sulfate		<0.140									GB

Date Required: 10/12/19

**Code Code Description**

- J Concentration estimated. Analyte was detected between the Method Detection Limit (MDL) and Minimum Quantitation Limit (MQL).
- M6 Matrix spike recovery was high.

  
 \_\_\_\_\_  
 Quality Assurance Officer

10-Oct-19  
 Report Date

The results apply only to the samples as received in the laboratory. The analyses used to obtain the results meet NELAC requirement, if applicable. No part of this work may be altered in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems - without written permission of AEPAnalytical Chemistry Services.

Shreveport Chemical Laboratory (SCL)

502 N. Allen Ave.  
Shreveport, LA 71101

Contacts: Jonathan Barnhill (318-673-3803)

103  
8/29/19  
Chain of Custody Record

Program: Coal Combustion Residuals (CCR)  
Site Contact: \_\_\_\_\_ Date: \_\_\_\_\_

For Lab Use Only:  
COC/Order #: \_\_\_\_\_

Project Name: Northeastern PP CCR  
Contact Name: Jill Parker-Witt  
Contact Phone: 318-673-3816

Analysis Turnaround Time (in Calendar Days)  
**RESULTS DUE OCTOBER 12**

Sampler(s): Kenneth McDonald/Matt Hamilton

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials				Mercury	Field-filter 500 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th) L bottles, pH<2, HNO3	COC/Order #
						Date/Time								
MW-2D	8/26/2019	1530	G	GW	1									228539
MW-3D	8/26/2019	1444	G	GW	1									228540
MW-4D	8/26/2019	1433	G	GW	1									228541
MW-5D	8/26/2019	1540	G	GW	1									228542
MW-6D	8/26/2019	1500	G	GW	1									228543
MW-9D	8/26/2019	1510	G	GW	1									228544
MW-12D	8/26/2019	1405	G	GW	1									228545
MW-14	8/26/2019	1600	G	GW	1									228546
MW-15	8/26/2019	1525	G	GW	1									228547
DUPLICATE LANDFILL	8/26/2019	1433	G	GW	1									228548

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

**\*\*\*\*\* RESULTS DUE OCTOBER 12**

Relinquished by: <i>[Signature]</i>	Company: <i>ESR</i>	Date/Time: <i>8/26/19 1146</i>	Received by: _____	Date/Time: _____
Relinquished by: _____	Company: _____	Date/Time: _____	Received in Laboratory by: <i>[Signature]</i>	Date/Time: <i>8-29-19 11:45</i>



SHREVEPORT CHEMICAL LABORATORY

502 N. Allen Ave.  
Shreveport, LA 71101  
Phone 318-673-3802  
FAX 318-673-3960

## PROJECT RECEIPT FORM

<b>Container Type</b> <input checked="" type="radio"/> Ice Chest <input type="radio"/> Bag <input type="radio"/> Action Pak <input type="radio"/> PCB Mailer <input type="radio"/> Bottle Other _____				<b>Delivery Type</b> <input type="radio"/> UPS <input type="radio"/> FEDEX <input type="radio"/> US Mail <input checked="" type="radio"/> Walk in <input type="radio"/> Shuttle Other _____			
Tracking # _____							

Client Jill Parker Witt

Received By Sandra Wallace

Received Date 8-29-19

Open Date 8-29-19

DGA    PCB Oil     Water    Oil    Soil

Solid    Liquid    Other \_\_\_\_\_

Container Temp    Read 3.1    Project I.D. \_\_\_\_\_

Correction Factor 1.2    Thermometer Serial #F04103

Corrected Temp 4.3    Were samples received on ice?  YES    NO

Did container arrive in good condition?  YES    NO

Was sample documentation received?  YES    NO

Was documentation filled out properly?  YES    NO

Were samples labeled properly?  YES    NO

Were correct containers used?  YES    NO

Were the pH's of samples appropriately checked? YES     NO    N/A

Total number of sample containers 10

Was any corrective action taken?  NO    Person Contacted \_\_\_\_\_

Date & Time \_\_\_\_\_

Comments \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





Dolan Chemical Laboratory  
4001 Bixby Road  
Groveport, OH 43125  
T: 614-836-4221, Audinet 210-4221  
F: 614-836-4168, Audinet 210-4168  
<http://aepenv/labs>

### Water Analysis

**Location: Northeastern Station**

**Report Date: 10/10/2019**

#### MW-2D

**Sample Number: 192953-001**                      **Date Collected: 08/26/2019 15:30**                      **Date Received: 9/4/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	10.7	mg/L		0.2	0.1	KAN	09/23/2019 18:24	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	14.3	mg/L		0.2	0.1	KAN	09/23/2019 18:24	EPA 200.8-1994, Rev. 5.4

#### MW-3D

**Sample Number: 192953-002**                      **Date Collected: 08/26/2019 14:44**                      **Date Received: 9/4/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.979	mg/L		0.2	0.1	KAN	09/23/2019 18:29	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	130	mg/L		0.2	0.1	KAN	09/23/2019 18:29	EPA 200.8-1994, Rev. 5.4

#### MW-4D

**Sample Number: 192953-003**                      **Date Collected: 08/26/2019 14:33**                      **Date Received: 9/4/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.987	mg/L		0.2	0.1	KAN	09/23/2019 18:34	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	184	mg/L		0.2	0.1	KAN	09/23/2019 18:34	EPA 200.8-1994, Rev. 5.4

#### MW-5D

**Sample Number: 192953-004**                      **Date Collected: 08/26/2019 15:40**                      **Date Received: 9/4/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.568	mg/L		0.2	0.1	KAN	09/23/2019 18:40	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	146	mg/L		0.2	0.1	KAN	09/23/2019 18:40	EPA 200.8-1994, Rev. 5.4

The MSD is outside the acceptable limit of 75-125%. The RPD between the MS/MSD exceeds 20%.

#### MW-6D

**Sample Number: 192953-005**                      **Date Collected: 08/26/2019 15:00**                      **Date Received: 9/4/2019**

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	2.88	mg/L		0.2	0.1	KAN	09/23/2019 18:45	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	181	mg/L		0.2	0.1	KAN	09/23/2019 18:45	EPA 200.8-1994, Rev. 5.4

**MW-9D**

Sample Number: 192953-006

Date Collected: 08/26/2019 15:10

Date Received: 9/4/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	6.95	mg/L		0.2	0.1	KAN	09/23/2019 18:50	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	136	mg/L		0.2	0.1	KAN	09/23/2019 18:50	EPA 200.8-1994, Rev. 5.4

**MW-12D**

Sample Number: 192953-007

Date Collected: 08/26/2019 14:05

Date Received: 9/4/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	8.90	mg/L		0.2	0.1	KAN	09/23/2019 18:55	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	96.3	mg/L		0.2	0.1	KAN	09/23/2019 18:55	EPA 200.8-1994, Rev. 5.4

**MW-14**

Sample Number: 192953-008

Date Collected: 08/26/2019 16:00

Date Received: 9/4/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	1.69	mg/L		0.2	0.1	KAN	09/23/2019 19:00	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	110	mg/L		0.2	0.1	KAN	09/23/2019 19:00	EPA 200.8-1994, Rev. 5.4

**MW-15**

Sample Number: 192953-009

Date Collected: 08/26/2019 15:25

Date Received: 9/4/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	8.28	mg/L		0.2	0.1	KAN	09/23/2019 20:38	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	119	mg/L		0.2	0.1	KAN	09/23/2019 20:38	EPA 200.8-1994, Rev. 5.4

**Duplicate Landfill**

Sample Number: 192953-010

Date Collected: 08/26/2019 14:33

Date Received: 9/4/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	0.956	mg/L		0.2	0.1	KAN	09/23/2019 20:43	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	183	mg/L		0.2	0.1	KAN	09/23/2019 20:43	EPA 200.8-1994, Rev. 5.4

**Equipment Blank Landfill**

Sample Number: 192953-011

Date Collected: 08/26/2019 15:55

Date Received: 9/4/2019

Parameter	Result	Units	Data Qual	RL	MDL	Analysis By	Analysis Date/Time	Method
Boron, B	< 0.1	mg/L	U	0.2	0.1	KAN	09/23/2019 20:48	EPA 200.8-1994, Rev. 5.4
Calcium, Ca	0.2	mg/L	J	0.2	0.1	KAN	09/23/2019 20:48	EPA 200.8-1994, Rev. 5.4

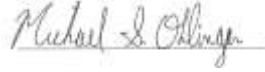
**Location: Northeastern Station**

**Report Date: 10/10/2019**

U: Analyte was analyzed and not detected at or above adjusted Method Detection Limit

J: Analyte was positively identified, though the quantitation was below Reporting Limit.

Landfill CCR



**Michael Ohlinger, Chemist**

Email [msohlinger@aep.com](mailto:msohlinger@aep.com)

Tel.

Fax 614-836-4168

Audinet 8-210-

**THIS TEST REPORT RELATES ONLY TO THE ITEMS TESTED AND SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY. ALL TEST RESULTS MEET ALL OF THE REQUIREMENTS OF THE ACCREDITING AUTHORITY, UNLESS OTHERWISE NOTED.**

# Chain of Custody Record

**Dolan Chemical Laboratory (DCL)**  
 4001 Bixby Road  
 Groveport, Ohio 43125  
 Michael Ohlinger (614-836-4184)  
 Contacts: Dave Conover (614-836-4219)

Program: Coal Combustion Residuals (CCR)

Site Contact:

Date:

For Lab Use Only:

COC/Order #:

Project Name: Northeastern PP Landfill CCR  
 Contact Name: Jill Parker-Witt  
 Contact Phone: 318-673-3816

Analysis Turnaround Time (in Calendar Days)  
**RESULTS DUE OCTOBER 12**

192953

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Sampler(s) Initials	250 mL bottle, pH<2, HNO3	Field-filter 250 mL bottle, then pH<2, HNO3	1 L bottle, Cool, 0-6C	Three (six every 10th*) L bottles, pH<2, HNO3	Sample Specific Notes:
MW-2D	8/26/2019	1530	G	GW	1		X				
MW-3D	8/26/2019	1444	G	GW	1		X				
MW-4D	8/26/2019	1433	G	GW	1		X				
MW-5D	8/26/2019	1540	G	GW	1		X				
MW-6D	8/26/2019	1500	G	GW	1		X				
MW-9D	8/26/2019	1510	G	GW	1		X				
MW-12D	8/26/2019	1405	G	GW	1		X				
MW-14	8/26/2019	1600	G	GW	1		X				
MW-15	8/26/2019	1525	G	GW	1		X				
DUPLICATE LANDFILL	8/26/2019	1433	G	GW	1		X				
EQUIPMENT BLANK LANDFILL	8/26/2019	1555	G	GW	1		X				

**Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other ; F= filter in field**

\* Six 1L Bottles must be collected for Radium for every 10th sample.

Special Instructions/QC Requirements & Comments:

\*\*\*\*\* RESULTS DUE OCTOBER 12

Relinquished by:	<i>[Signature]</i>	Company:	Date/Time:	Received by:	Date/Time:	Received in Laboratory by:	Date/Time:
Relinquished by:	<i>[Signature]</i>	Company:	08/30/19 1400	Received by:		<i>[Signature]</i>	
Relinquished by:		Company:		Received in Laboratory by:		<i>[Signature]</i>	
							9/4/19 11:50PM

# AEP WATER & WASTE SAMPLE RECEIPT FORM

<u>Package Type</u>				<u>Delivery Type</u>					
<input checked="" type="radio"/> Cooler	<input type="radio"/> Box	<input type="radio"/> Bag	<input type="radio"/> Envelope	<input type="radio"/> PONY	<input type="radio"/> UPS	<input checked="" type="radio"/> FedEX	<input type="radio"/> USPS		
Other _____				Other _____					
Plant/Customer <u>Northeastern</u>				Number of Plastic Containers: <u>11</u>					
Opened By <u>MJD</u>				Number of Glass Containers: <u>-</u>					
Date/Time <u>9/4/19 11:50 AM</u>				Number of Mercury Containers: _____					
Were all temperatures within 0-6°C? Y / N or <u>(N/A)</u> Initial: _____ on ice / <u>(no ice)</u>									
#2 (IR Gun Ser# <u>181354432</u> , Expir. <u>06-12-20</u> ) - If No, specify each deviation _____									
Was container in good condition? <u>(Y)</u> / N Comments _____									
Was Chain of Custody received? <u>(Y)</u> / N Comments _____									
Requested turnaround: <u>10/12/19</u> If RUSH, who was notified? _____									
pH (15 min)		Cr <sup>6+</sup> (pres) (24 hr)		NO <sub>2</sub> or NO <sub>3</sub> (48 hr)		ortho-PO <sub>4</sub> (48 hr)		Hg-diss (pres) (48 hr)	
Was COC filled out properly? <u>(Y)</u> / N Comments _____									
Were samples labeled properly? Y / <u>(N)</u> Comments <u>No dates/times on labels</u>									
Were correct containers used? <u>(Y)</u> / N Comments _____									
Was pH checked & Color Coding done? <u>(Y)</u> / N or N/A Initial & Date: <u>JAB/ MGW</u>									
- Was Add'l Preservative needed? Y / <u>(N)</u> If Yes, By whom & when: _____ (See Prep Book)									
Is sample filtration requested? Y / <u>(N)</u> Comments _____ (See Prep Book)									
Was the customer contacted? If Yes, Person Contacted: _____									
Lab ID# <u>192953</u>				Initial & Date & Time: _____					
Logged by <u>MJD</u>				Comments _____					
Reviewed by <u>SM</u>				_____					
_____				_____					

**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

**APPENDIX V**

ODEQ 2019 Correspondence



RECEIVED FEB 04 2019

SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

January 30, 2019

Ms. Jill Parker-Witt, P.E.  
American Electric Power  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Response to Notice of Deficiency - Alternate Source Demonstration (ASD) – Coal Combustion Residuals (CCR) Landfill  
Public Service Company of Oklahoma-Northeastern Power Station (NPS) Ash Landfill  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

The Revised 2017 Annual Groundwater Monitoring Report for the landfill at the Public Service Company of Oklahoma-Northeast Power Station (NPS) contained the initial statistical analysis, dated February 26, 2018, for the detection monitoring program. It utilized interwell statistical analyses for boron and pH but intrawell methods for all other constituents. Statistically significant increases (SSIs) over background were indicated for boron at groundwater monitoring wells MW-6D, MW-9D and MW-15. Oklahoma Administrative Code (OAC) 252:517-9-5(e)(2) allows NPS to demonstrate, within ninety (90) days of detecting an SSI, that a source other than the CCR landfill caused the SSIs over background levels. An alternate source demonstration (ASD) dated May 1, 2018 was submitted by NPS. In the ASD, NPS determined that MW-7D and MW-8D were not appropriate upgradient background wells for statistical analyses due to groundwater mounding at the landfill and elevated salts not reflective of groundwater geochemistry across the site. DEQ agrees that an interwell approach is not currently viable for boron at MW-6D, MW-9D and MW-15 using MW-7D and MW-8D as background wells. The submittal also contained the justification for the use of an intrawell approach when statistically evaluating boron. The previous SSIs were not observed when using the intrawell statistical analyses methods for boron; and the ASD attributed the SSIs to statistical errors and not a release from the landfill.

On August 2, 2018, the Department of Environmental Quality (DEQ) issued a Notice of Deficiency (NOD) for the ASD at the landfill. The NOD requested NPS to conduct an independent study and hydrogeological investigation to identify local geochemical conditions and expected groundwater quality for boron near MW-6D, MW-9D, and MW-15 to justify the intrawell approach. Further, if the intrawell approach could not be justified, then an alternative monitor well location would need to be determined to establish interwell background values for boron.

On October 8, 2018, by email, DEQ received a 30-day time extension request from NPS to complete and submit the hydrogeological investigation to fulfill the NOD. DEQ approved the



time extension and received the completed hydrogeological investigation on October 30, 2018, by email, as part of the Response to the NOD. Additional information was received on January 10, 2019 and January 14, 2019.

DEQ reviewed the NOD Response and provides the following assessment that addresses the ASD conclusions below.

1. Page 1. The geochemical mixing model could not simultaneously replicate the concentrations of boron and other common inorganic species given the low boron concentrations relative to Total Dissolved Solids (TDS) in samples of leachate; therefore, landfill leakage was dismissed as a source of boron in groundwater due to an inability to simulate observed groundwater data using the mixing model.

The inability to replicate the relatively high boron concentrations in MW-6D, MW9D and MW-15 using a simple mixing model to simulate dilution does not prove that the source of boron is not from CCR associated with the landfill. It more likely demonstrates that more complex contaminant transport mechanisms such as chemical reactions and interactions with the aquifer are affecting the boron migration and concentrations in groundwater. The boron in the leachate is of similar magnitude to the concentrations in MW-6D, MW9D and MW-15.

2. Page 2. MW-6D, MW-9D and MW-15 are installed in locations where coal ash had been used as structural fill. Boron is suspected to be leaching from the CCR used as structural fill, rather than CCR that is contained in the Landfill.

OAC 252:517-9-1(d) requires NPS to control the sources of releases to prevent further releases of contaminants into the environment. The source of boron detected in these monitoring wells is CCR.

3. Page 3, 5 and 6. Boron is known to adsorb to bentonite. It is hypothesized that since the start of construction of the slurry wall and grout curtain, boron leached from the CCR and was adsorbed by the bentonite grout. It is proposed that boron is now being released to the deep groundwater and monitor wells (MW-6D, MW-9D and MW-15) as a result of calcium partitioning from the native groundwater to the bentonite clay which then releases adsorbed boron, sodium and interstitial water.

This proposition gives the initial source of the boron as the CCR Landfill. It is now being released to the environment as documented by relatively high boron in MW-6D, MW-9D and MW-15.

DEQ has concluded that the Response provided by NPS does not sufficiently show that the elevated boron concentrations in MW-6D, MW-9D and MW-15 are from a source other than CCR. Therefore, the ASD Response is not accepted and the intrawell approach for evaluating boron in monitor wells MW-6D, MW-9D and MW-15 at the landfill is not considered viable nor



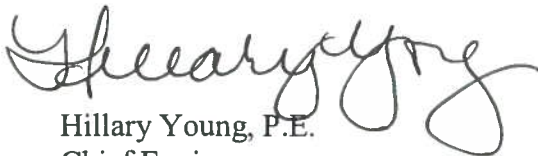
protective of the environment since the elevated boron there could not be definitively attributed to a non-CCR source. However, DEQ agrees with the ASD in terms of a statistical error related to inappropriate background wells MW -7D and MW-8D.

OAC 252:517-9-5(e)(1) requires NPS, within 90 days of detecting a SSI, to establish an assessment monitoring program. The assessment monitoring program establishes background values and groundwater protection standards (GWPS) in accordance with OAC 252:517-9-6. Since MW-7D and MW-8D are not viable background wells, the GWPS and background values cannot be established; therefore, prior to instituting an assessment monitoring program, a background well representative of the aquifer must be obtained.

A background well for conducting interwell statistical evaluations for boron and establishing GWPS for Appendix B constituents is needed. In the ASD NOD, DEQ gave NPS the option of determining an alternative monitoring well from existing wells at the site, or constructing a new monitoring well to be used as a background monitoring well for interwell statistical analyses. On January 10, 2019, NPS informed DEQ that groundwater monitoring well SP-6 would be used for background monitoring and monthly monitoring would commence this month. A total of eight (8) samples are required to determine background water quality. In an email dated January 11, 2019, DEQ approved the use of SP-6 as a background monitoring well and approved the monthly monitoring to obtain background data. Please add SP-7 as a second background well since it has better water yield, would provide a means to evaluate spatial variation and would provide pooled background data for statistical comparisons to compliance wells.

Please revise the groundwater monitoring network to include SP-6 and SP-7. Also, please revise related groundwater monitoring documents, including the sampling and analysis plan and the statistical analysis plan. Once acquisition of 8 background samples have been completed and approved by DEQ, please conduct the statistical analyses to determine if SSIs over background exist at the landfill. If so, an assessment monitoring plan shall be submitted to DEQ within 90 days. If you have any questions, please contact Ms. Cynthia Hailes, P.E. at (405) 702-5114.

Sincerely,



Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh



SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

March 1, 2019

**CERTIFIED MAIL RETURN RECEIPT REQUESTED**

Ms. Jill Parker-Witt, P.E.  
American Electric Power – Northeastern Power Station  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Annual CCR Unit Inspection Reports 252:517-13-4 and 252:517-13-5  
Public Service Company of Oklahoma - Northeastern Power Station  
Coal Combustion Residuals Bottom Ash Pond and **Landfill**  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

The Department of Environmental Quality (DEQ) received, by email dated January 25, 2019, the notification of the completion of the annual engineering inspections for the Bottom Ash Pond (BAP) and the Ash Landfill (Landfill) at American Electric Power's Public Service Company of Oklahoma- Northeastern Power Station (AEP-NPS).

The notice indicates the inspection reports were placed in the operating record on January 10, 2019 in accordance with Oklahoma Administrative Code (OAC) 252:517-19-1(g). The inspection reports were posted to AEP's publicly accessible internet site as required by OAC 252:517-19-3(g).

Both inspection reports are accepted as submitted. If you have any questions, please contact Ms. Cindy Hailes at (405) 702-5114.

Sincerely,

A handwritten signature in black ink that reads 'Hillary Young'.

Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh





RECEIVED MAR 18 2019

SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

March 11, 2019

Ms. Jill Parker-Witt, P.E.  
American Electric Power  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Annual Groundwater Monitoring Report – Landfill  
Public Service Company of Oklahoma-Northeastern Power Station Ash Landfill  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

On January 31, 2019, the Department of Environmental Quality (DEQ) received the Annual Groundwater Monitoring Report – Landfill CCR Management Unit (Report) for Northeastern Power Station Landfill (NPS). Field sheets were received by email on March 7, 2019 and analytical reports on March 11, 2019. Oklahoma Administrative Code (OAC) 252:517-9-1(e) requires NPS prepare the annual groundwater monitoring and corrective action report to document the status of the coal combustion residual (CCR) landfill. The Report is to be submitted to DEQ for review and approval per OAC 252:517-9-1(g).

Section II Groundwater Monitoring Well Locations and Identification Numbers on Page 3 of the Report lists the upgradient monitoring wells as MW-7D and MW-8D. The fifteen (15) deep downgradient monitoring wells listed are MW1D-13D and MW14-17. In a letter submitted on May 3, 2018, NPS determined that MW-7D and MW-8D were not appropriate upgradient background wells for statistical analyses due to groundwater mounding at the landfill and elevated salts not reflective of groundwater geochemistry across the site. DEQ agreed with NPS and on January 10, 2019, NPS informed DEQ that groundwater monitoring well SP-6 would be used for background monitoring and monthly monitoring would commence that month. In an email dated January 11, 2019, DEQ approved the use of SP-6 as a background monitoring well and requested NPS add SP-7 as a second background well. Both monitoring wells are currently undergoing monthly background monitoring. Neither SP-6 nor SP-7 are included in the annual report since DEQ did not approve them to commence background monitoring until after December 31, 2018.

Section V Statistical Evaluation of 2018 Events states, “Eight background samples were collected from 4D, 5D, and 12D and analyzed for Appendix A and B constituents. AEP continues to attempt to collect background samples from 1D, 2D, 10D, 11D, 13D, 14, 16, and 17 as these wells do not produce sufficient groundwater volume after allowing the well to recharge for 24 hours.” Please continue to collect background samples from these wells. Semi-annual sampling events occurred on May 30, 2018 and October 22, 2019 under the detection monitoring program.

Ms. Jill Parker-Witt, P.E.  
American Electric Power – Northeastern Power Station  
March 11, 2019  
Page 2 of 2

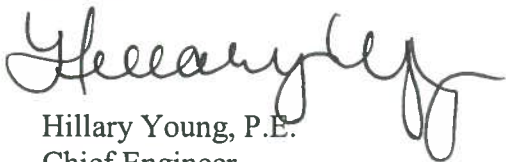
Table 1 lists the calculated groundwater velocities in MW-3D, MW-6D, MW-7D, MW-8D, MW-9D and MW-15 and the estimated residence time of groundwater within the well. The residence times range from 44 days to 259 days, indicating very slow groundwater movement. Groundwater flow is primarily to the south with indications of mounding.

The statistical analysis presented in this report is for the October 11, 2017 and January 22, 2018 sampling events. The statistical analysis for the May 30, 2018 and October 22, 2018 sampling events was not completed by January 31, 2019 and will be submitted in a separate document. In future annual reports, please provide all laboratory reports and statistical analyses conducted in the year represented by the report. This should include at least the statistical evaluation of the first semi-annual sampling event even if the statistical analyses for the second semi-annual sampling event have not been completed. OAC 252:517-4(i)(2) requires statistical analysis to determine SSI's be completed for samples within 90 days after completing sampling.

The statistical analysis based on the October 11, 2017 and January 22, 2018 sampling events resulted in the statistically significant increase in boron at MW-6D (3.74 mg/L)(4.24 mg/L), MW-9D (7.07 mg/L)(7.43 mg/L) and at MW-15 (9.62 mg/L)(9.16 mg/L). NPS conducted an alternate source demonstration (ASD) that was not accepted by DEQ; however, DEQ approved sampling in SP-6 and SP-7 to determine if they were suitable for use as background monitoring wells. In a letter dated January 30, 2019, DEQ determined that since MW-7D and MW-8D are not viable background wells, the groundwater protection standards and background values cannot be established; therefore, prior to instituting an assessment monitoring program, a background well representative of the aquifer must be obtained.

The Report is accepted as submitted. Please submit the analytical results for SP-6 and SP-7 within 90 days of when AEP completes background sampling. Please include the analyses performed to determine their suitability as background monitoring wells and any statistical re-evaluation of constituent background values and groundwater protection standards. If you have any questions, please contact Ms. Cynthia Hailes, P.E. at (405) 702-5114.

Sincerely,



Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh



SCOTT A THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

April 5, 2019

Elizabeth Gunter  
Counsel for Public Service Company of Oklahoma  
Public Service Company of Oklahoma  
1 Riverside Plaza  
Columbus, OH 43215

RE: Financial Assurance – Corporate Financial Test  
Facility: Northeastern Power Station Coal Ash Landfill, Permit Number: 3566010; and Bottom Ash Pond  
(currently in the permit application process)  
Rogers County, Oklahoma

Dear Ms. Gunter:

As required by Oklahoma Administrative Code (OAC) 252:517-17-3: Duty to maintain financial assurance, this letter acknowledges that DEQ has received Public Service Company of Oklahoma's (PSO's) 2019 Corporate Financial Test mechanism. PSO is the owner/operator of the Northeastern Power Station Coal Ash Landfill (Landfill), Permit No. 3566016, and the Bottom Ash Pond. The mechanism has been determined to be satisfactory at this time. Importantly however, DEQ may require additional information at any time if it appears PSO no longer satisfies its financial assurance obligation as owner/operator of the Landfill and the Bottom Ash Pond. DEQ reserves any and all rights it has to pursue enforcement actions or proceedings under applicable law with regard to PSO's financial assurance obligations, if the obligations are found to be inadequate.

PSO has certified the following cost estimates are assured through the company's 2019 Corporate Financial Test mechanism dated March 7, 2019:

- Bottom Ash Pond:
  - Closure:  $\$9,393,690 \times 3\% = \$9,675,501$
  - Post-Closure:  $\$1,189,415 \times 3\% = \$1,225,097$
  - Total:  $\$10,900,598$
- Landfill (Permit No. 3566016):
  - Closure:  $\$3,969,964 \times 3\% = \$4,089,062$
  - Post-Closure:  $\$5,821,984 \times 3\% = \$5,996,644$
  - Total:  $\$10,085,706$

Thank you for ensuring PSO has met its 2019 financial assurance obligations for the Landfill and Bottom Ash Pond. If you have any questions, please contact Carol Bartlett at (405) 702-5109.

Sincerely,

Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/cb



SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

June 25, 2019

Ms. Jill Parker-Witt, P.E.  
American Electric Power  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Monitoring Well SP-6 Analysis Report  
Public Service Company of Oklahoma-Northeastern Power Station Ash Landfill  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

On March 19, 2019, the Department of Environmental Quality (DEQ) received, by email, the Analysis Report (Report) for Oklahoma Administrative Code (OAC) 252:517 Appendix A anions and mercury in Monitoring Well SP-6 for Northeastern Power Station Landfill (Landfill). The Report was used to determine if SP-6 is acceptable as an upgradient background well for statistical analysis in the Landfill monitoring well network.

In a letter dated April 13, 2018, NPS determined that MW-7D and MW-8D were not appropriate upgradient background wells for statistical analyses due to groundwater mounding at the landfill and elevated salts not reflective of groundwater geochemistry across the site. In an email dated January 11, 2019, DEQ approved SP-6 to commence background monitoring to determine its use as a potential background monitoring well and NPS added SP-7 as a second potential background monitoring well.

SP-6 was sampled on January 16, 2019. Chloride (14,133 mg/L) and TDS (22,956 mg/L) in SP-6 exceeded the concentrations of MW-7D and MW-8D and all downgradient monitoring wells sampled in the October 22, 2018 sampling event.

After reviewing the Report, it appears that SP-6 is not a suitable upgradient background monitoring well for the Landfill. Please submit the analytical results from all samplings from monitoring well SP-7 when complete.

If you have any questions, please contact Ms. Cynthia Hailes, P.E. at (405) 702-5114.

Sincerely,

A handwritten signature in black ink that reads 'Hillary Young'.

Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh





SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

September 12, 2019

RECEIVED SEP 16 2019

Ms. Jill Parker-Witt, P.E.  
American Electric Power  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Monitoring Well SP-6 Mercury and SP-7 Analysis Reports  
Public Service Company of Oklahoma-Northeastern Power Station Ash Landfill  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

In a letter dated April 13, 2018, Northeastern Power Station (NPS) determined that MW-7D and MW-8D were not appropriate upgradient background wells for statistical analyses for the NPS Landfill due to groundwater mounding at the Landfill and elevated salts not reflective of groundwater geochemistry across the site. In an email dated January 11, 2019, the Department of Environmental Quality (DEQ) approved SP-6 to commence background monitoring to determine its use as a potential background monitoring well and NPS added SP-7 as a second potential background monitoring well.

On June 25, 2019, DEQ determined that monitoring well SP-6 was not a suitable upgradient background monitoring well. On July 16, 2019, DEQ received, by email, the Analysis Report (Report) for Oklahoma Administrative Code (OAC) 252:517 Appendix A anions and mercury in SP-6 and SP-7. The Report was used to determine if SP-7 is acceptable as an upgradient background well for statistical analysis in the Landfill monitoring well network.

SP-7 was sampled on May 7, 2019. Chloride (30,900 mg/L) and TDS (47,146 mg/L) in SP-7 exceeded the concentrations of MW-7D and MW-8D and all downgradient monitoring wells sampled in the October 22, 2018 sampling event.

After reviewing the Report, it appears that SP-7 is not a suitable upgradient background monitoring well for the Landfill. Please review the site geology and hydrology and submit a plan to find a suitable background monitoring well that is representative of background groundwater quality for the Landfill.

If you have any questions, please contact Ms. Cynthia Hailes, P.E. at (405) 702-5114.

Sincerely,

Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh



RECEIVED OCT 18 2019

SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

October 11, 2019

Ms. Jill Parker-Witt, P.E.  
American Electric Power  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Annual CCR Fugitive Dust Control Report – OAC 252:517-13-1(b)(6)  
Public Service Company of Oklahoma  
Northeastern Power Station **Ash Landfill** and Bottom Ash Pond  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

On September 12, 2019, the Department of Environmental Quality (DEQ) received the Annual CCR Fugitive Dust Control Report (Report) from Northeastern Power Station (NPS). Oklahoma Administrative Code (OAC) 252:517-13-1(c) requires the Report to be submitted to DEQ and placed in the facility's operating record in accordance with OAC 252:517-19-1(g)(1). The Report has also been placed on the facility's publicly accessible Internet site as required by OAC 252:517-19-1(g)(2). The Landfill is a permitted CCR landfill that accepts CCR generated on-site. The Bottom Ash Pond accepts bottom ash from Unit 3 that is wet sluiced to the surface impoundment for removal and segregation. The permit application for the BAP is currently under review by DEQ.

The Report meets the requirements of OAC 252:517-13-1(c) and is accepted as submitted.

If you have any questions, please contact Ms. Cindy Hailes at (405) 702-5114.

Sincerely,

Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh







SCOTT A. THOMPSON  
Executive Director

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

KEVIN STITT  
Governor

December 19, 2019

Ms. Jill Parker-Witt, P.E.  
American Electric Power  
502 North Allen Avenue  
Shreveport, LA 71101

Re: Fugitive Dust Control Plan Revision 4 – OAC 252:517-13-1(b)(6)  
Public Service Company of Oklahoma  
Northeastern Power Station **Ash Landfill** and Bottom Ash Pond  
Rogers County  
Solid Waste Permit No. 3566010

Dear Ms. Parker-Witt:

On October 21, 2019, the Department of Environmental Quality (DEQ) received the Fugitive Dust Control Plan Rev. 4 from Northeastern Power Station (NPS). Oklahoma Administrative Code (OAC) 252:517-13-1(b)(6) allows amendment of the written Coal Combustion Residuals (CCR) fugitive dust control plan at any time provided the revised plan is approved by DEQ then placed in the facility's operating record in accordance with OAC 252:517-19-1(g)(1).

The August 2019 revisions are summarized in Appendix E. No regulatory or technical revisions were made.

DEQ accepts the Fugitive Dust Control Plan – Revision 4. Please notify DEQ when the revised Dust Control Plan has been placed in the operating record per OAC 252:517-19-2 (c) and on the facility's publically accessible internet site per OAC 252:517-19-3-(d).

If you have any questions, please contact Ms. Cindy Hailes at (405) 702-5114.

Sincerely,

A handwritten signature in black ink that reads 'Hillary Young'.

Hillary Young, P.E.  
Chief Engineer  
Land Protection Division

HY/ckh

