2020 Annual Groundwater Monitoring Report Per EPA CCR Rule (CFR § 257.90-.98)

Asbury Generating Station CCR Impoundment
Jasper County, MO

January 2021

Prepared For:
The Empire District Electric Company
602 S. Joplin Avenue
Joplin, Missouri 64801

Anika Careaga
1/27/2021

Midwest Environmental CONSULTANTS

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CERTIFICATE OF COMPLIANCE

Annual Groundwater Monitoring Report for Existing CCR Surface Impoundments
EPA CCR Rule Section 40 CFR 257.90 (e)
Empire District Electric Company – Asbury Power Plant
Asbury, Missouri

The following presents the Annual Groundwater Monitoring Report for the Empire District Electric Company's CCR Impoundment at the Asbury Power Plant. This serves as certification that the facility is in compliance with 40 CFR 257.90 (e) of the EPA CCR.

40 CFR 257.90 (e) states:
(e) Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report.

CERTIFICATION 257.90 (e)
The undersigned Professional Engineer (P.E.) is familiar with the requirements of 40 CFR Part 257. The above summarizes the status of the Groundwater Monitoring for the Empire District Electric Company's CCR Impoundment at the Asbury Power Plant. I hereby certify that the facility is in compliance with 40 CFR 257.90 (e) and all information has been placed in the Operating Record. Notification of availability of this document should be provided to the State Director as required in section 257.107(h).

Name: Anika Careaga, P.E.

Signature: Anika Careaga

Date: 1/27/2021

Registration Number: 2005022085

State: Missouri

Seal:

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Anika Carranza
1/27/2021

1.0 INTRODUCTION

The EPA Coal Combustion Residual Regulations (40 CFR Part 257) (CCR Rule) require groundwater monitoring of CCR impoundment. This Asbury Generating Station CCR impoundment groundwater monitoring sampling report is in accordance with the EPA CCR Rule.

In accordance with the EPA CCR Rule (§ 257.90-.98) the status of the Groundwater Monitoring was placed on-line October 17, 2017, as required by the EPA CCR rule. On November 2, 2017 the facility received approval from Missouri Department of Natural Resources (MDNR) of their groundwater system (included in **Appendix 1**). Empire notified the MDNR "State Director" via e-mail when this document was posted on-line, as required in the CCR rule.

The EPA CCR Rule requires the annual groundwater report be prepared by January 31st of the following year. The first report was due January 31, 2018. This report was prepared in general accordance with the EPA CCR Rule for groundwater requirements. These regulations outline groundwater monitoring requirements and data evaluation methods. The annual groundwater report for the 2020 sampling events will be posted on-line within 30 days of placement in the operating record.

The purpose of the groundwater monitoring plan is to monitor the ground water quality surrounding the facility and to evaluate potential impacts and/or releases from facility operations. Background groundwater data was collected from January 2016 to August 2017. After the background data plus the first semi-annual sampling events, a reduced sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will generally be completed during the months of May and November. Statistical analysis for EPA Appendix III began after the first semi-annual sampling event was collected on October 4, 2017 to determine if a statistically significant increase (SSI) has occurred. If an SSI is verified, additional evaluation is required to determine if the SSI was caused by the CCR impoundment.

On May 13, 2020, a semi-annual sampling event was conducted per the EPA CCR Rule (§ 257.90-.98). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. For quality assurance and quality control measures, a duplicate sample at MW-7 was taken. These samples were preserved and submitted directly to the laboratory.

This report is a summary of the May 2020 sampling event and the findings of the statistical analysis of the results of the groundwater monitoring program at the Asbury Generating Station CCR Impoundment. Specific information of each sampling event can be obtained from the individual report which is part of the Asbury Operating Record.

Four more sets of background data were available to add to the background data set for the November 2019 sampling event. The analysis of the additional data for the background data set was conducted and is included in the November 2019 Report in **Appendix B**. No trending was found in the additional four sets of data so they were added to the baseline data set to increase the statistical power of the background data.

3.0 MAY 2020 SAMPLING EVENT

On May 13, 2020, a semi-annual detection monitoring sampling event was conducted per the EPA CCR Rule (§ 257.94). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. For quality assurance and quality control measures, a duplicate sample at MW-7 was taken.

Table 1 – Constituents Identified Above Laboratory Reporting Limits During May 2020 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	0.1	<0.08J	0.27	0.91	0.32	0.42	0.26
Calcium	mg/L	NA	38	100	270	100	260	250	190	480
Chloride	mg/L	NA	110	57	9.7	5.8	75	14	19	44
Fluoride	mg/L	4.0	0.42	0.17	0.12	0.34	0.45	0.27	0.34	<0.25J
pH	SU	NA	6.77	5.77	6.49	6.59	6.38	6.33	6.13	6.3
Sulfate	mg/L	NA	46	460	540	130	1200	880	710	1600
Total Dissolved Solids	mg/L	NA	560	910	1500	570	2100	1600	1400	2800

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

The results of the EPA requested interwell prediction limit statistical analysis of the May 2020 sampling event indicate that the site is in compliance. The results for boron (MW-5A and MW-6A) and fluoride (MW-5A) indicated an initial interwell prediction limit exceedance for the listed monitoring well during May 2020 sampling event. There is a current primary (health based) MCL for fluoride of 4.0 mg/L but the result is below the limit. Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but all results were below that limit. Trending was found to be significant for boron (MW-5A) but not significant in boron (MW-6A) and fluoride (MW-5A). Boron is also trending upward in MW-2 which is an up-gradient well. The facility plans to resample as part of the November 2020 sampling event. **Appendix A** contains the complete report for the May 2020 sampling event.

During the November 2019 sampling event, Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted. However, these initial prediction limit exceedances were not confirmed during the May 2020 sampling event. Therefore, the site will continue with the detection monitoring program per the EPA CCR Rule (§ 257.94) on a semi-annual basis for the November 2020 sampling event.

4.0 NOVEMBER 2020 SAMPLING EVENT

On November 10, 2020, a semi-annual detection monitoring sampling event was conducted per the EPA CCR Rule (§ 257.94). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. For quality assurance and quality control measures, a duplicate sample at MW-5 was taken.

Table 2 – Constituents Identified Above Laboratory Reporting Limits During November 2020 Sampling Event

Constituent	Units	MCL	MW-2 (up)	MW-3 (up)	MW-4 (down)	MW-5 (down)	MW-5A (down)	MW-6 (down)	MW-6A (down)	MW-7 (side)
Appendix III										
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.25	1.9	0.32	0.38	0.22
Calcium	mg/L	NA	37	92	230	71	380	240	170	460
Chloride	mg/L	NA	120	62	4.4	6.4	170	13	25	39
Fluoride	mg/L	4.0	0.39	0.14	<0.1J	0.27	<0.1J	0.22	0.3	<0.1J
pH	SU	NA	6.51	5.68	6.8	7.6	6.72	6.96	7.09	6.81
Sulfate	mg/L	NA	56	530	550	160	2300	1200	850	2200
Total Dissolved Solids	mg/L	NA	430	860	1800	510	3200	1700	1500	2800

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

No constituents were detected above the Federal Safe Drinking Water maximum contaminant level (MCL) during the sampling event. The results of the EPA requested interwell prediction limit statistical analysis of the November 2020 sampling event indicate a confirmed exceedance for Boron (MW-5A). Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L which the results were below. The facility will conduct an alternative source demonstration in the next 90 days per the EPA CCR Rule (§ 257.94).

The results for pH (MW-5, MW-6 and MW-6A) and total dissolved solids (MW-5A) indicated initial interwell prediction limit exceedances for the listed monitoring well during November 2020 sampling event. There are no current primary (health based) MCLs for pH or total dissolved solids. The facility plans to resample as part of the May 2021 sampling event. During the May 2020 sampling event, Initial interwell prediction exceedances in boron (MW-5A and MW-6A) and fluoride (MW-5A) were noted. However, the initial prediction limit exceedances of boron (MW-6A) and fluoride (MW-5A) were not confirmed during the November 2020 sampling event. **Appendix B** contains the full report for the November 2020 sampling event.

5.0 EXCUTIVE SUMMARY

This report is a summary of the 2020 sampling events and the findings of the statistical analysis of the results of the groundwater detection monitoring program at the Asbury Generating Station CCR Impoundment. Specific information of each sampling event can be obtained from the individual reports which are included as appendices and have been placed in the Asbury Operating Record. Statistical analysis will continue utilizing interwell prediction limits per EPA's request.

The results of the alternative source demonstration will determine if the site continues with the detection monitoring program on a semi-annual basis or moves into assessment monitoring per the EPA CCR Rule (§ 257.94).

APPENDIX A

May 2020 Sampling Event

2020 Groundwater Monitoring, Sampling & Statistics Per EPA CCR Rule (CFR § 257.90-.98)

May Sampling Event

Asbury Generating Station CCR Impoundment
Jasper County, MO

July 2020

Prepared For:
The Empire District Electric Company
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The EPA CCR Rule requires the annual groundwater report be posted on-line by January 31st of the following year. The first report was due January 31, 2018. This report was prepared in general accordance with the EPA CCR Rule for groundwater requirements. These regulations outline groundwater monitoring requirements and data evaluation methods. The annual groundwater report for the 2020 sampling events will be posted on-line by January 31, 2021.

The purpose of the groundwater monitoring plan is to monitor the ground water quality surrounding the facility and to evaluate potential impacts and/or releases from facility operations. Background groundwater data was collected from January 2016 to August 2017. After the background data plus the first semi-annual sampling events, a reduced sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will generally be completed during the months of May and November. Statistical analysis for EPA Appendix III began after the first semi-annual sampling event was collected on October 4, 2017 to determine if a statistically significant increase (SSI) has occurred. If an SSI is verified, additional evaluation is required to determine if the SSI was caused by the CCR impoundment.

On May 13, 2020, a semi-annual sampling event was conducted per the EPA CCR Rule (§ 257.90-.98). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. For quality assurance and quality control measures, a duplicate sample at MW-7 was taken. These samples were preserved and submitted directly to the laboratory.

This report is a summary of the May 2020 sampling event and the findings of the statistical analysis of the results of the groundwater monitoring program at the Asbury Generating Station CCR Impoundment. Specific information of each sampling event can be obtained from the individual report which is part of the Asbury Operating Record.

2.0 SITE LOCATION

The site occupies the north half of Section 17, Township 30 North, and Range 33 West on the Asbury 7.5-Minute Quadrangle Map as seen in **Figure 1**. The site is located approximately 5.5 miles north-northeast of Asbury, Missouri, about 14 miles north-northwest of Joplin, Missouri. A map showing the locations of the monitoring wells is on **Figure 2**.

2.1 History

In March 1996, five (5) groundwater monitoring wells, MW-1 through MW-5, were installed around the perimeter of the Asbury Generating Station CCR impoundment. Monitoring wells MW-1, MW-2 and MW-3 were installed to a total depth of between 27.0 to 28.5 feet below ground surface (bgs). Monitoring wells MW-4 and MW-5 were installed to a total depth of 48 feet bgs. Each of the five monitoring wells was equipped with 10.0-foot well screens. The five wells were then developed, purged, and sampled in 1996.

In 2003, two (2) additional groundwater monitoring wells were installed and identified as MW-6 and MW-7. Both wells had 2-inch diameter PVC well casings installed to an approximate total depth of 44 feet below ground surface. Both wells were installed with an above ground steel protective cover. No other construction details such as well screen lengths were available for these two (2) wells. In December 2015, two (2) additional groundwater monitoring wells were installed and identified as MW-5A and MW-6A.

All wells are registered with MDNR – Missouri Geological Survey Program.

2.2 Site Geology

Drilling and subsurface investigation activities at the Site and as part of the MDNR approved CCR landfill Detailed Site Investigation (DSI) for the adjacent landfill area identified three (3) primary geologic units at the Site. These geologic units include the surficial soil layer, Warner Sandstone (uppermost aquifer), and Riverton Shale (confining unit). The information presented herein includes the primary elements of a site characterization work plan consistent with the MDNR guidance.

Surficial Soil. Soils at the site consist of a surficial unit of cohesive soils (e.g., CL, SC, ML, and CH) underlain by Pennsylvanian-age bedrock. Soil thickness at the Site ranges from approximately 15-25 feet.

Warner Sandstone. The Warner Sandstone (Sandstone) is the uppermost bedrock unit in south portion of the Site. In the north area of the Site, the Sandstone is overlain by the Riverton Shale (Shale). Based on the DSI information, the Sandstone and Shale can occur as alternating layers. The Sandstone and Shale are gradational in places and transition from shaley sandstone to sandy shale. According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Warner Sandstone formation is described as follows: “Generally, the lower part is interbedded, very fine grained sandstone and claystone. The upper part is largely medium-bedded to massive channel fill sandstone. In places, the Warner consists primarily of shale and claystone, with only minor amounts of sandstone” and “ranges in thickness from 0 to 15m (49.2 ft.).”

The Sandstone is more than 25-30 feet thick in places and is generally medium hard and thin to medium bedded with occasional shale partings. The degree of induration of the Sandstone varies and generally increases with depth. Slug tests performed at selected DSI piezometers screened in

the Sandstone exhibited hydraulic conductivities ranging from approximately 1.3x10-4 cm/sec to 5.9x10-6 cm/sec. The slug test results are consistent with values for sandstone and shaley sandstone. The groundwater gradient is towards the east and Blackberry Creek.

Riverton Shale. Layers of the Riverton Shale (Shale) exhibited thicknesses ranging from approximately one foot to more than 10 feet. The Shale is generally dark gray to light gray. The Shale is mainly thin bedded with hardness ranging from soft to hard. Six packer tests were performed during the DSI to assess the hydraulic conductivity of the Shale. The packer test results ranged from approximately $3.2x10^{-6}$ cm/sec to $4.9x10^{-8}$ cm/sec. The packer test data indicates that the Shale is an effective confining unit.

According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Riverton Shale formation is described as "dark gray to black, fine-grained, relatively brittle shale and contains as many as three coal beds, each of which is underlain by underclay" and "varies in thickness from a featheredge to more than 90 feet".

Unnamed Coal. The Shale includes coal seams in places that range in thickness from a few inches to approximately 1.5 feet. The coal is generally black to dark gray.

2.3 Groundwater Monitoring Network Design

The groundwater monitoring system for the CCR impoundment consists of nine (9) groundwater monitoring wells. Two (2) wells are considered upgradient. Two (2) wells are considered sidegradient; one is only monitored for groundwater elevation. The remaining five (5) wells are considered downgradient.

The groundwater monitoring wells (MWs) at the Asbury Generating Station are equipped with individual dedicated poly tubing to be connected to a peristaltic pump/controller at the surface. Low-flow, micro-purge and sampling techniques and technology are utilized to collect groundwater samples from the subject wells. The groundwater sampling procedures are discussed in further detail below.

2.4 Groundwater Monitoring Network

The locations of the monitoring wells are shown on **Figure 2**. The groundwater monitoring system for the site consists of the following monitoring wells:

- MW-1 Sidegradient (water level only)
- MW-2 Upgradient
- MW-3 Upgradient
- MW-4 Downgradient
- MW-5 Downgradient
- MW-5A Downgradient
- MW-6 Downgradient
- MW-6A Downgradient
- MW-7 Sidegradient

2.5 Seasonal Variation

Historical groundwater elevation data has been limited. However, adequate lengths of well screen have been utilized during the construction of the wells to accommodate typical seasonal groundwater elevation variations seen in southwest Missouri.

2.6 Groundwater Flow Direction

Historically, the seasonally high potentiometric surface indicated the groundwater flow direction to the east. **Figure 3** is a potentiometric map for this May 2018 sampling event.

Originally MW-7 was thought to be a downgradient well but review of the potentiometric mapping from the eight background sampling events revealed that the well is actually a sidegradient well. Therefore, the designation for MW-7 has been changed from a downgradient to a sidegradient well for compliance monitoring.

3.0 BASELINE GROUNDWATER DATA

3.1 Baseline Data Collection

Per EPA CCR Rule § 257.94(b), the site initiated the detection monitoring program in January 2016 to include obtaining a minimum of eight (8) independent samples for each background and downgradient well. The eight (8) independent groundwater samples were obtained and analyzed as required by the CCR Rule under per the baseline groundwater monitoring plan. Background groundwater data was collected from January 2016 to August 2017.

Groundwater Monitoring Reports were completed for each sampling event and have been placed in the Operating Record. Summary tables of the results from each event are included in **Appendix 2**. A listing of each event is below:

- January 2016
- March 2016
- May 2016
- August 2016
- October 2016
- March 2017
- June 2017
- August 2017

Initial baseline monitoring was required at all monitoring wells. The sampling frequency was quarterly or more frequently for the first two (2) years. After the background data plus the first semi-annual sampling events, a reduced lower sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will be completed during the months of May and October.

The initial two (2) years of baseline and the first semi-annual detection monitoring included parameters listed in Appendix III and Appendix IV of the EPA CCR Rule. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. **Appendix 2** contains the list of constituents.

3.2 Background Data Analysis

Sanitas™ for Ground Water Version 9.2.13 was used to run the statistical analyses with settings used as recommended by the Sanitas™ training course and user manual. The background data consisted of eight sampling events between January 2016 and August 2017 for both the Appendix III and IV constituents. Eight background events are needed for statistical analysis. An analysis of the Appendix III background data was conducted and is included in **Appendix 5**. Trending was found in Boron (MW-3) and Total Dissolved Solids (MW-3). MW-3 is an up-gradient well. Trending was not removed at that time; otherwise the site would be below the minimum of eight background samples needed to run statistics.

Four more sets of background data were available to add to the background data set for the November 2019 sampling event. The analysis of the additional data for the background data set was conducted and is included in **Appendix 5**. No trending was found in the additional four sets of data so they were added to the baseline data set to increase the statistical power of the background data.

4.0 GROUNDWATER SAMPLING EVENT

On May 13, 2020, eight (8) groundwater monitoring wells were sampled by Midwest Environmental Consultants (MEC) for the EPA CCR Rule Appendix III parameters. For quality assurance and quality control measures, a duplicate sample was taken at MW-7. The sampling protocol and methodology was to be conducted in accordance to the facility's Sampling and Analysis Plan. **Table 1** provides a list of the analytical methods employed by the subcontracted laboratory.

Table 1 – Analytical Methods	
Method	**Description**
9056A	Anions, Ion Chromatography
6020A	Metals (ICP/MS)
SM 2540C	Solids, Total Dissolved (TDS)
Field Sampling	Field Sampling

Appendix 3 includes Monitoring Well Field Inspection sheets and field notes. The physical integrity of the wells was good. During sample collection each of the wells was monitored for pump discharge and formation recharge. Initially, a static water level for each well was recorded (**Table 2**). To ensure sufficient recharge while sampling, static water levels were collected during pumping. Prior to sample collection, field parameters for each well were measured with a flow-through meter. When the field parameters stabilized, samples for analytical testing were collected and placed on ice for hand delivery to the laboratory. At the conclusion of sample collection from each well, a final static water level measurement was obtained. The samples were collected in the appropriately pre-preserved sample containers and placed on ice for delivery.

Table 2 - Groundwater Sampling Field Parameters Summary During May 2020 Sampling Event				
WELL ID	**STATIC WATER LEVEL (ft-BTOC)**		**PURGE RATE (mL/min)**	**STABILIZED pH**
	Initial	**Final**		
MW-1*	NT	NA	NA	NA
MW-2	1.04	3.20	200	6.77
MW-3	0.00	0.50	200	5.77
MW-4	5.26	9.94	200	6.49
MW-5	0.99	6.02	200	6.59
MW-5A	8.38	15.81	200	6.38
MW-6	8.11	12.45	200	6.33
MW-6A	7.38	11.78	200	6.13
MW-7	2.56	2.74	200	6.30

* Water Level Only NA – Not Applicable NT – Not Tested (inaccessible)

Appendix 4 includes the initial analytical results for the sampling event. Included with this analytical report are sample information; chain of custody; wet chemistry data; and volatile data.

5.0 DATA VALIDATION PROCEDURES FOR GROUNDWATER MONITORING DATA

Midwest Environmental Consultants receives Data Packages from the analytical laboratory (Test America). The internal quality control/quality assurance case narratives and reported data are then reviewed. Generally the data validation procedures established by the U.S. Environmental Protection Agency *Contract Laboratory Program Functional Guidelines for Organic Data Review* and *Functional Guidelines for Inorganic Data Review* is followed. These guidelines are used to assign data qualifiers to the data. A formal data validation report for the site is not prepared; however, any significant issues are noted in the groundwater monitoring report.

MEC evaluates the data set for precision, accuracy, representativeness, comparability, and completeness (PARCC).

5.1 Precision

Laboratory Precision. Laboratory quality control procedures to measure precision consist of laboratory control sample (LCS) analysis and analysis of matrix spike/matrix spike duplicates (MS/MSD). These analyses are used to define analytical variability.

Field Precision. Analyses of duplicate samples are used to define the total variability (replicability) of the sampling/analytical system as a whole. Field replicates are collected at a rate of one per sampling event.

5.2 Accuracy

Accuracy is determined by calculating the percent recoveries for analyses of surrogate compounds, LCSs, continuing calibration check standards, and matrix spike samples. Acceptable percent recoveries are established for SW-846 and EPA methods. Field and laboratory blank analysis are also used to address measurement bias.

Field Blanks. Field blanks consisted of a trip blank and a field blank. One trip blank per cooler accompanies samples for volatile organic analyses.

Laboratory Blanks. Method blanks, artificial, matrix-less samples, are analyzed to monitor the laboratory analysis system for interferences and contamination from glassware, reagents, etc. Method blanks are taken through the entire sample preparation process. They are included with each batch of extractions or digestions prepared, or with each 20 samples, whichever is more frequent.

5.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely reflect site condition. Representativeness of the data is determined by comparing actual sampling procedures to those delineated in the field sampling plan, comparing results from field replicate samples and reviewing the results of field blanks. Field notes are reviewed as part of our data validation process.

5.4 Comparability

Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. Comparability is ensured by using established and approved sample collection techniques and analytical methods, consistent basis of analysis, consistent reporting units, and analyzing standard reference materials.

5.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected under controlled laboratory conditions. Completeness is defined as the valid data percentage of the total tests requested. Valid data are defined as those where the sample arrived at the laboratory intact, properly preserved, in sufficient quantity to perform the requested analyses, and accompanied by a completed chain-of-custody form. Furthermore, the sample must have been analyzed within the specified holding time and in such a manner that analytical QC acceptance criteria were met.

6.0 STATISTICAL ANALYSIS

6.1 Sampling Results

The constituents with results above the laboratory reporting limits are included in **Table 3**. The Test America laboratory analytical results are included in **Appendix 4**.

Table 3 – Constituents Identified Above Laboratory Reporting Limits During May 2020 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	0.1	<0.08J	0.27	0.91	0.32	0.42	0.26
Calcium	mg/L	NA	38	100	270	100	260	250	190	480
Chloride	mg/L	NA	110	57	9.7	5.8	75	14	19	44
Fluoride	mg/L	4.0	0.42	0.17	0.12	0.34	0.45	0.27	0.34	<0.25J
pH	SU	NA	6.77	5.77	6.49	6.59	6.38	6.33	6.13	6.3
Sulfate	mg/L	NA	46	460	540	130	1200	880	710	1600
Total Dissolved Solids	mg/L	NA	560	910	1500	570	2100	1600	1400	2800

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

No constituents were detected above the Federal Safe Drinking Water maximum contaminant level (MCL) during the sampling event.

6.2 Statistical Analysis

The November 2019 sampling event report indicated confirmed intrawell prediction limits exceedances. Intrawell prediction limits were utilized per the facility's 2018 Groundwater Statistical Analysis Plan. The Annual Report recommending the site move into assessment monitoring was stamped on January 23, 2020 and submitted to the facility. However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from background wells, which include upgradient and sidegradient wells per EPA Unified Guidance definitions, and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. In order to appropriately characterize the groundwater beneath the site, the statistical methods utilized at the facility consider the following facts as they relate to site:

- Potential differences in geochemical characteristics of the groundwater caused by the differing lithologies in contact with the screened interval from well to well.
- Potential impacts of surface infiltration into the groundwater environment.

Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. Municipal and demolition waste landfills in Missouri typically utilize intrawell prediction limits per MDNR. However, it was noted that the power curve for these

analyses was not considered strong yet. The data set consisted of only 13 sampling events from January 2016 to November 2019. EPA Unified Guidance recommends 20 or more sampling events for background data for intrawell prediction limits. A small data set triggers an SSI when there is even a slight increase in concentration. Sanitas also note to each exceedance "*Insufficient data to test for seasonality: data were not deseasonalized.*" Minor increases in concentration noted in the May and November 2019 sampling events did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

The EPA Unified Guidance Chapter 5.2.3 states "*In groundwater data collection and testing, background conditions may not be static over time. Caution should be observed in removing observations which may signal a change in natural groundwater quality. Even when conditions have not changed, an apparently extreme measurement may represent nothing more than a portion of the background distribution that has yet to be observed. This is particularly true if the background data set contains fewer than 20 samples.*" Chapter 5.2.4 states "*With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples*". Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

MDNR made several requests per EPA in the correspondence located in **Appendix 1** which included the EPA review of the groundwater reports as seen in **Table 4**.

Table 4 – EPA Review of Groundwater Reports	
Facility	Asbury Power Plant
Location	Asbury, MO
Owner	Empire District Electric Company
Units	Upper Pond-unlined, South Pond-unlined, Lower Pond-unlined
Geology	Surficial unit of clay, clayey sand, and silt approximately 15 to 25 feet thick underlain by Warner Sandstone approximately 25-30 feet thick in the southern portion of the site and the Riverton Shale in the northern area of the site
Problematic Use of Intra Well Comparisons	Analytical results indicate consistent differences in contaminant concentrations between upgradient and downgradient wells. Consequently, inter well comparisons are feasible and would be preferable in the absence of compelling reasons to use intra well analysis
Problematic Alternate Source Determination	
Conclusions	While there are no boring logs in the documents to confirm that the wells are screened in the same geologic unit, consistency in the field parameters and the description of the geology suggest that the wells are screened in the sandstone. The analytical results indicate consistent differences in contaminant concentrations between upgradient and downgradient wells, consequently, interwell comparisons are feasible and would be preferable in the absence of compelling reasons to use intra wells analyses

Sanitas™ for Ground Water Version 9.6.25 was used to run the statistical analyses with settings used as recommended by the Sanitas™ training course and user manual. Interwell prediction intervals were run per EPA's request. The Sanitas™ output is included in **Appendix 5**.

Statistical analysis was performed on the Appendix III constituents from the May 2020 sampling event compared to the updated background dataset. Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from upgradient background wells and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. However, EPA has requested the site utilize interwell prediction limits.

Statistical analysis results are presented below for those constituents determined to have an exceeded a prediction limit. However, EPA's "*Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*," March 2009, EPA 530/R-09-007 is referenced multiple times in the preamble of the EPA CCR regulations for groundwater sampling and analysis requirements. According to the EPA Unified Guidance, a prediction limit exceedance is not considered a statistically significant increase (SSI) until it is confirmed through retesting. SSIs generated by non-detectable results or with less than eight background events are considered statistically invalid.

Table 5 lists the parameters with exceedances of prediction limits during the May 2020 sampling event, the associated monitoring wells, if the exceedance is initial versus confirmed, the predicted limit, the measured concentration, and the MCL set forth in the National Drinking Water Regulations. The MCL is the highest level of a contaminant that is allowed in drinking water.

Table 5 – Interwell Prediction Limit Exceedances Observed During May 2020 Sampling Event

Constituent	Monitoring Well	Initial vs. Confirmed	Predicted Limit (mg/L)	Measured Concentration (mg/L)	Drinking Water MCLs (mg/L)
Boron	MW-5A	Initial	0.4147	0.91	NA/4.0 GWPS*
Boron	MW-6A	Initial	0.4147	0.42	NA/4.0 GWPS*
Fluoride	MW-5A	Initial	0.4053	0.45	4.0

NA = Not Applicable *EPA proposed groundwater protection standard

6.3 Results Interpretation

The results of the EPA requested interwell prediction limit statistical analysis of the May 2020 sampling event indicate that the site is in compliance. The results for boron (MW-5A and MW-6A) and fluoride (MW-5A) indicated an initial interwell prediction limit exceedance for the listed monitoring well during May 2020 sampling event. There is a current primary (health based) MCL for fluoride of 4.0 mg/L but the result is below the limit. Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but all results were below that limit. Trending was found to be significant for boron (MW-5A) but not significant in boron (MW-6A) and fluoride (MW-5A). Boron is also trending upward in MW-2 which is an up-gradient well. The facility plans to resample as part of the November 2020 sampling event.

During the November 2019 sampling event, Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted. However, these initial prediction limit exceedances were not confirmed during the May 2020 sampling event.
Below is a discussion of the previous results for comparison.

November 2019
The result for Chloride (MW-5A), pH (MW-4) and Sulfate (MW-5A) indicated an initial intra-well prediction limit exceedance for the listed monitoring well during the November 2019 sampling event. There is no current primary (health based) MCL for chloride, pH or sulfate.

During the May 2019, the result for Boron (MW-5A) indicated an initial intra-well prediction limit exceedance and Total Dissolved Solids (MW-5A) indicated a confirmed intra-well prediction limit exceedance. There is no current primary (health based) MCL for boron and total dissolved solids. These prediction limit exceedances were confirmed during the November 2019 sampling event. A resample of MW-5A was conducted on December 11, 2019. The results of the resample confirmed the exceedances and the site planned to move into assessment monitoring.

Table 6 – December 2019 Resample Result Comparison

Constituent	Units	MCL	MW-5A	MW-5A Resample
Appendix III				
Boron	mg/L	NA	0.82	1.0
Calcium	mg/L	NA	240	270
Chloride	mg/L	NA	69	82
Fluoride	mg/L	4.0	<0.5J	0.26
pH	SU	NA	7.2	7
Sulfate	mg/L	NA	1200	1300
Total Dissolved Solids	mg/L	NA	2000	2200

However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

The results of the EPA requested interwell prediction limit statistical analysis of the November 2019 sampling event indicate that the site is in compliance. Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted but have not been confirmed. There is no current primary (health based) Maximum Contamination Level (MCL) for pH. Trending was not found to be significant for pH in any well during the analysis of the background data set.

May 2019
The result for Boron (MW-5A) and pH (MW-3(u), MW-5A, MW-6 and MW-6A) indicated an initial intra-well prediction limit exceedance for the listed monitoring well during the May 2019 sampling event. There is no current primary (health based) MCL boron or pH. The facility plans to resample as part of the November 2019 sampling event.

During the November 2018, the result for Total Dissolved Solids (MW-5A) indicated an initial intra-well prediction limit exceedance. There is no current primary (health based) MCL for total dissolved solids. This initial prediction limit exceedances was confirmed during the May 2019 sampling event. However, it should be noted that the power curve for these analyses is not considered strong. A small data set triggers an SSI when there is even a slight increase in concentration. The EPA Unified Guidance Chapter 5.2.4 states "With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples".

Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated. It was also noted that higher levels of total dissolved solids were seen in the side-gradient well MW-7 demonstrating that a there was likely not a release from the facility. Therefore, the site will continue with detection monitoring on a semi-annual basis at this time.

November 2018
The result for Total Dissolved Solids (MW-5A) indicated an initial intra-well prediction limit exceedance for the listed monitoring well during the November 2018 sampling event. There is no current primary (health based) MCL for total dissolved solids. The facility plans to resample MW-5A for Total Dissolved Solids as part of the May 2019 sampling event.

During the May 2018, no intra-well prediction limits were exceeded. Therefore, there were no initial prediction limit exceedances to confirm during the November 2018 sampling event.

May 2018
No intra-well prediction limits were exceeded during the May 2018 sampling event.
The October 2017 results for Total Dissolved Solids (MW-7) indicated an exceedance of the predicted limit for the listed monitoring wells. However, this initial prediction limit exceedance was not confirmed during the May 2018 sampling event.

October 2017
The result for Total Dissolved Solids (MW-7) indicated an initial intra-well prediction limit exceedance for the listed monitoring wells during the October 2017 sampling event. However, the result was below the tolerance limit. There is no current primary (health based) MCL for total dissolved solids.

Review of the Total Dissolved Solids in the duplicate sample taken from the same well (MW-7) shows a result of 3,000 mg/L, which would not be an exceedance of the intra-well prediction limit of 3,069 mg/L. Due to the variances between the sample and the duplicate, the site will re-evaluate MW-7 for Total Dissolved Solids during the next sampling event.

MW-7 is considered a sidegradient well, therefore no further action is needed for exceedances in sidegradient or upgradient wells.

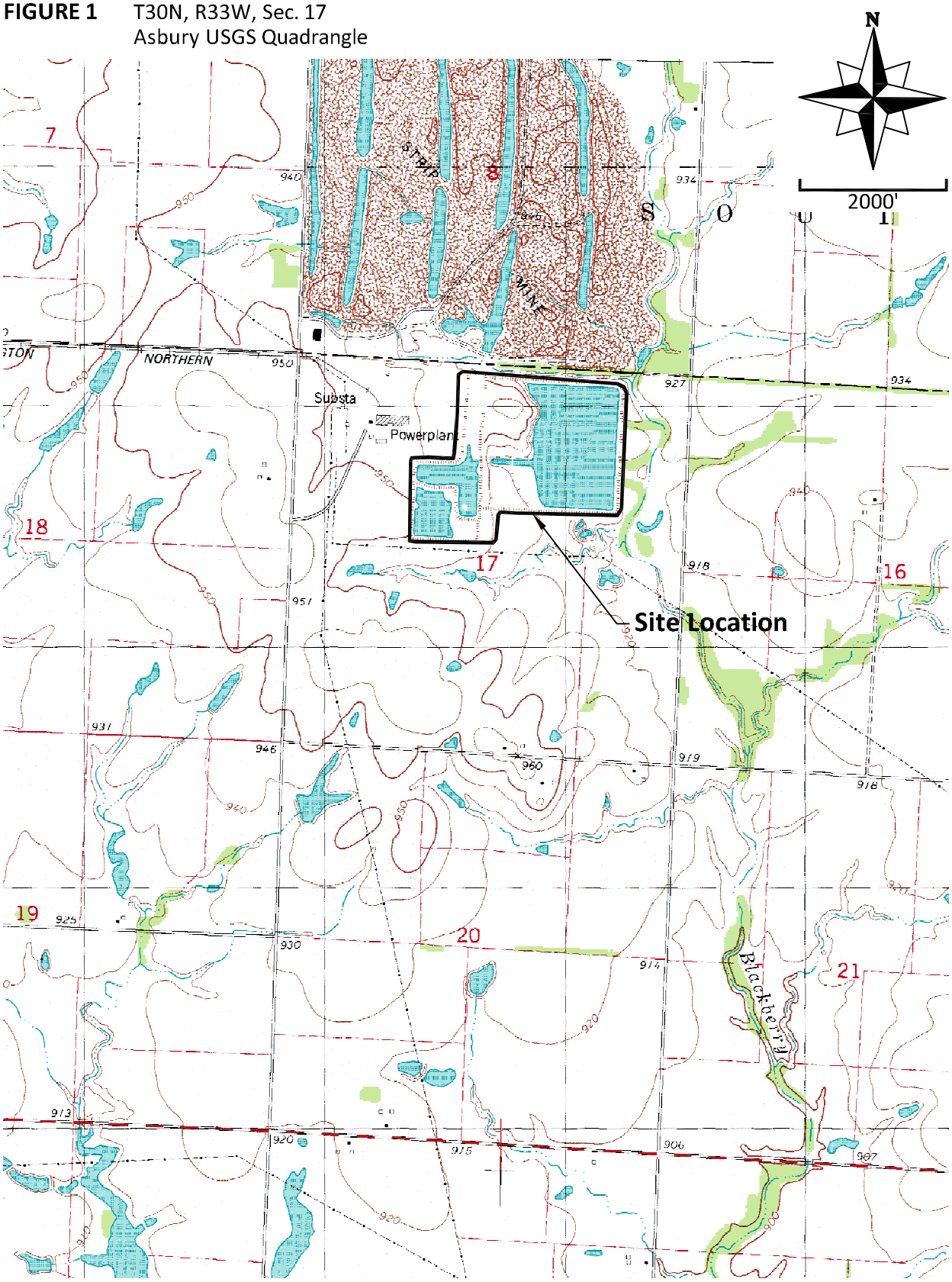
6.4 Proposed Actions
The site will continue with the detection monitoring program on a semi-annual basis. However, the constituents listed in Appendix IV will remain eliminated from the overall semi-annual

detection monitoring plan after this review of the semi-annual groundwater sampling event analytical results, according to the EPA CCR Rule. Statistical analysis will be completed with interwell prediction limits per EPA's request.

FIGURES

Asbury Generating Station CCR Impoundment
Groundwater Sampling Event - May 2020
Site Location Map

FIGURE 1 T30N, R33W, Sec. 17
Asbury USGS Quadrangle



July 2020

Asbury Generating Station CCR Impoundment
Groundwater Sampling Event - May 2020
Groundwater Monitoring System

FIGURE 2

Well ID	Northing	Easting
MW-1	435791.18 *	2765165.35 *
MW-2	434428.46	2762861.37
MW-3	432842.77	2762720.80
MW-4	433709.99	2764938.99
MW-5	433659.27	2765966.23
MW-5A	434150.04	2765969.78
MW-6	434600.46	2765987.98
MW-6A	435071.44	2766010.46
MW-7	435505.42	2765993.13

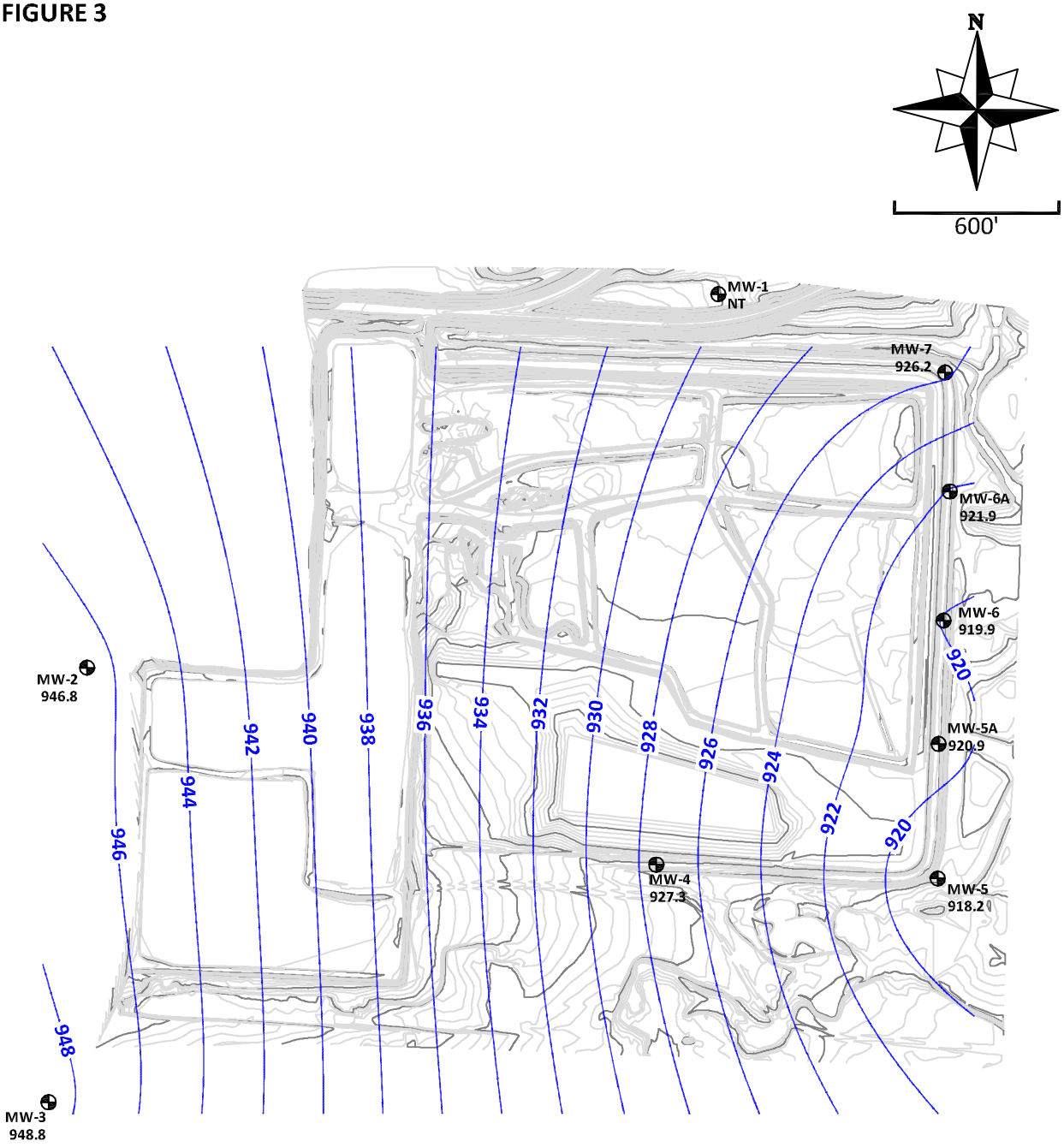
* Coordinate location is approximate

Legend

Monitoring Well

Asbury Generating Station CCR Impoundment
Groundwater Sampling Event - May 2020
Groundwater Piezometric Surface Map

FIGURE 3



Well ID	Northing	Easting	Top Of Casing	Static Water Level (BTOC)	Static Water Level
MW-1	435791.18	2765165.35	933.4	NT	NT
MW-2	434428.46	2762861.37	947.8	1.0	946.8
MW-3	432842.77	2762720.80	948.8	0.0	948.8
MW-4	433709.99	2764938.99	932.6	5.3	927.3
MW-5	433659.27	2765966.23	919.2	1.0	918.2
MW-5A	434150.04	2765969.78	929.3	8.4	920.9
MW-6	434600.46	2765987.98	928.0	8.1	919.9
MW-6A	435071.44	2766010.46	929.3	7.4	921.9
MW-7	435505.42	2765993.13	928.8	2.6	926.2

Legend

⊕ **Monitoring Well**

APPENDIX 1

EPA/MDNR Correspondence

Drew Landoll

From: Snellen, Greg <greg.snellen@dnr.mo.gov>
Sent: Tuesday, January 21, 2020 3:34 PM
To: Drew Landoll
Cc: aston.robert@epa.gov; Nagel, Chris; Snellen, Greg
Subject: RE: EPA Request for Information regarding CCR Units

Good afternoon Drew,

The Environmental Protection Agency (EPA) has been working to verify data on facility specific CCR websites required by 40 CFR 257 at the national level. EPA headquarters provided a list of inquiries to the EPA regions and requested they work with the states to answer their questions. States were given a choice as to the amount of involvement they could have with the information gathering. Missouri elected to take the lead on contacting the facilities in the state, providing the information requested by the EPA and relaying the answers back.

For your company, the EPA has questions about facilities and units which may be seeking an extension under the alternate closure provisions in 2020 and what type of extension may be requested.

They provided the following list of units:

Region	State	Part A Extension	Plant Name	Unit Name	Unit Type	Op Status	Unit Class	NOI Type	NOI Date	Alterr NOI
7	MO		Asbury	Lower Pond	Surface Impoundment	Active	Existing			
7	MO		Asbury	Upper Pond	Surface Impoundment	Active	Existing			
7	MO		Asbury	South Pond	Surface Impoundment	Active	Existing			

EPA has requested a response on extensions by February 14, 2020.

Additionally, the EPA has the following question related to groundwater monitoring:

Facility	Location	Owner	Units	Geology	Problematic Use of Intra Well Comparisons	Problematic Alternate Source Determinations	Conclusions
Asbury Power Plant	Asbury MO	Empire District Electric Company	Upper Pond-unlined South Pond-unlined Lower Pond-unlined	Surficial unit of clay, clayey sand, and silt approximately 15 to 25 feet thick underlain by Warner Sandstone approximately 25-30 feet thick in the southern portion of the site and the Riverton Shale in the northern area of the site	Analytical results indicate consistent differences in contaminant concentrations between upgradient and downgradient wells. Consequently, inter well comparisons are feasible and would be preferable in the absence of compelling reasons to use intra well analysis		While there are no boring logs in the documents to confirm that the wells are screened in the same geologic unit, consistency in the field parameters and the description of the geology suggest that the wells are screened in the sandstone. The analytical results indicate consistent differences in contaminant concentrations

Facility	Location	Owner	Units	Geology	Problematic Use of Intra Well Comparisons	Problematic Alternate Source Determinations	Conclusions
							between upgradient and downgradient wells, consequently, interwell comparisons are feasible and would be preferable in the absence of compelling reasons to use intra wells analyses

At this time, there is not a deadline for this request.

Please let the Department know if you have any questions. You can also direct inquires to Bob Aston with EPA Region 7 who is copied on this email.

Thank you

Greg Snellen
Environmental Supervisor
Waste Management Program
573-526-8779

We'd like your feedback on the service you received from the Missouri Department of Natural Resources. Please consider taking a few minutes to complete the department's Customer Satisfaction Survey at https://www.surveymonkey.com/r/MoDNRsurvey. Thank you.

From: Aston, Robert
Sent: Friday, January 10, 2020 7:48 AM
To: Nagel, Chris <Christopher.Nagel@dnr.mo.gov>; Snellen, Greg <greg.snellen@dnr.mo.gov>
Cc: Martin, Mike <Martin.Mike@epa.gov>; Kloeckner, Jane <Kloeckner.Jane@epa.gov>; Catlin, Kelley <Catlin.Kelley@epa.gov>; Werner, Leslye <Werner.Leslye@epa.gov>; Hayworth, Brad <Hayworth.Brad@epa.gov>
Subject: CCR workload

Chris and Greg,

As a follow-up to our call on Wednesday

On Monday December 2, 2019 EPA published in the Federal Register a proposed rule for the Disposal of Coal Combustion Residuals From Electric Utilities: A Holistic Approach to Closure Part A: Deadline To Initiate Closure. The major elements of this proposed rule include:

- Definition of Lined Unit (removing a clay-lined unit from the definition),
- New initiation of Closure and Cease Receipt of Waste Deadline of August 31, 2020,
- New Alternate Closure Provisions for surface impoundment: Extensions to the initiation of closure

Nationally, EPA is gathering data to determine the number of facilities and units which may be seeking an extension under the alternate closure provisions in 2020 and is tasking the regions to work with our state partners and the facilities to determine the number of such facilities and units and what type of extension may be requested. Region 7 is seeking the state's assistance in gathering this information.

To be eligible for an extension the surface impoundment needs to be:

- An existing surface impoundment (eligible inactive surface impoundments should already be closing)
- An unlined or "clay-lined" surface impoundment
- Passed all location restrictions or only failed the uppermost aquifer restriction
  - Those that failed multiple location restrictions or did not post should have ceased receipt of waste in April 2019

This proposed rule offers facilities three options with regards to an extension

1.) Three month self-implementing extension (§ 257.103(e)(1)). Under this provision the surface impoundment must cease receipt of waste no later than November 30, 2020, and the facility must document certain conditions and certify "that the CCR and/or non-CCR waste streams must continue to be managed in that CCR surface impoundment to allow the facility to complete the measures necessary to provide alternative disposal capacity, either on-site or off-site of the facility" on its publicly available website no later than August 31, 2020.

2.) Site specific alternative to initiation of closure deadline due to lack of disposal capacity (§ 257.103(f)(1)). This provision allows facilities to submit demonstrations to EPA for approval for a specific amount of time to be able to continue to use their surface impoundment while developing alternate capacity for the CCR and non-CCR waste streams. This extension allows the facility to continue to use a unit (surface impoundment) for a maximum of 5 years, until October 15, 2023. Under this extension, facilities are required to submit their demonstrations to EPA no later than June 30, 2020.

3.) Site specific alternative to initiation of closure deadline due to Permanent Cessation of Coal Fired Boiler(s) by a Date Certain (§ 257.103(f)(2)): If a facility is ceasing generation of coal fired boiler(s) by a date certain, then the facility must complete closure by October 17, 2023 for surface impoundments less than 40 acres and by October 17, 2028 for surface impoundments larger than 40 acres. The facility is required to submit a demonstration to EPA for approval to continue to use their CCR surface impoundments. Under this extension, demonstrations are required to be submitted to EPA for approval no later than May 15, 2020.

As you can see above, the deadlines for requesting extensions are approaching quickly and will become effective when the proposed rule is final. EPA is requesting assistance from the regions, states, and facilities to estimate the number and types of extensions facility owners/operators may be requesting. EPA headquarters has developed a list (attached) of facilities which may be eligible for extensions by EPA Region and State. This list was developed by examining information included on individual facility web sites which are required as part of the CCR regulations. The list of potential sites in Missouri has been attached (attached Excel file) to this email. EPA headquarters has requested that individual regions reach out to their state counterparts to identify facility contacts and reach out to those contacts to determine which facilities and units may be requesting an extension and which type of extension may be requested. EPA headquarters has requested that this information be collected by February 14, 2020.

As part of the effort to determine what type of an extension a facility may need, EPA would also like the state's assistance in obtaining input regarding an estimate of the length of the extension that may be requested by the facility owners/operators. As part of the discussions, we need an estimate regarding the length of the extension. For example, EPA needs to estimate the following:

- Facilities that will not need an extension
- Facilities that will only need till November 2020 (short term extension)
- Longer than November – need about 6 months more
- Longer than November – need about 1 year
- Longer than November – need longer than 18 months

EPA is collecting this data in order to estimate the potential workload which could be associated with reviewing the above mentioned extension requests.

In addition, EPA headquarters routinely reviews the information posted on individual facility web sites. As part of that review EPA headquarters has identified sites in each region where specific facility information which is required to be posted is either missing, incomplete or technical questions exist. As part of this review EPA has developed two lists. See attached. One list deals with compliance issues related to documents which are, or in some cases are not, posted on the specific facility websites. The second list deals with groundwater questions related to Alternate Source Demonstrations and Intrawell analyses. With regards to the list dealing with compliance issues related to documents, EPA headquarters has requested that the regions work with their state counterparts to identify the appropriate facility contact. The plan is that EPA Headquarters would take the lead in coordination with the regions and states to contact the facilities to discuss and remedy the identified issues. With regards to the second list dealing with Alternate Source Demonstrations, EPA headquarters has requested that the regions work with their state counterparts to identify the appropriate facility contacts. The regions and or the states would then take the lead to address any identified issues. No specific timeframe has been established to address the questions related to either of the above lists. Region 7 anticipates working closely with the state in addressing these issues.

It should be noted that EPA headquarters routinely reviews CCR facility websites and could identify additional questions. If that should occur Region 7 would again reach out to the states.

At your convenience I would like to follow-up with you on the above issues sometime next week to discuss Missouri's perspective and any comments you may have. If you have any questions please do not hesitate to call or email me.

Thanks

Bob Aston
USEPA Region 7
(913)551-7392

Region	State	Part A Extension	Plant Name	Unit Name	Unit Type	Op Status	Unit Class	NOI Type	NOI Date	Alternative _Closure_ Provisions NOI	Liner Type	Liner_ Posting_ Date	Location Restrictions	Groundwater Monitoring Status
7	MO		Asbury	Lower Pond	Surface Impoundment	Active	Existing				Unlined	10/17/2016	Fail Aquifer Only	Detection Monitoring - No SSIs
7	MO		Asbury	Upper Pond	Surface Impoundment	Active	Existing				Unlined	10/17/2016	Fail Aquifer Only	Detection Monitoring - No SSIs
7	MO		Asbury	South Pond	Surface Impoundment	Active	Existing				Unlined	10/17/2016	Fail Aquifer Only	Detection Monitoring - No SSIs

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

NOV 02 2017

Mr. Kavan Stull, Senior Environmental Coordinator
Empire District
602 South Joplin Avenue
Joplin, MO 64802

RE: Site Characterization Workplan

Dear Mr. Stull:

The Missouri Department of Natural Resources has reviewed the document "Site Characterization Workplan" dated May 16, 2017. The site has undergone extensive characterization regarding construction of a coal combustion residual (CCR) landfill near the CCR impoundments. The department's Water Protection Program has determined, through consulting with the Missouri Geological Survey, this characterization is sufficient and may be used in whole to complete the required monitoring of the sub-surface conditions at the site. Additional submittal of site characterization is not necessary, as the previous submittal meets the requirement for special condition 19(b) of the Missouri State Operating Permit MO-0095362. The facility may proceed with the next step laid out in the permit; special condition 19(c). Enclosed is the Missouri Geological Survey concurrence.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20 1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC is by mail at Administrative Hearing Commission, United States Post Office Building, Third Floor, 131 West High Street, P.O. Box 1557, Jefferson City, MO 65102, by phone at 573-751-2422, by fax at 573-751-5018, and by website at www.oa.mo.gov/ahc.

If you have any questions, please do not hesitate to contact Ms. Pam Hackler by mail at Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176, by phone at 573-526-3386; or by email at pam.hackler@dnr.mo.gov. Thank you.

Sincerely,

WATER PROTECTION PROGRAM

Michael J. Abbott, Chief
Operating Permits Section

MJA/php

Enclosure

c: Mr. Randall Willoughby, Southwest Regional Office

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

MEMORANDUM

SWR18011
Jasper County

DATE: October 18, 2017

TO: Pam Hackler- WPP- Industrial Wastewater Unit

FROM: Fletcher N. Bone, Geologist, Environmental Geology Section, Geological Survey Program, MGS

Fletcher N. Bone

STATE OF MISSOURI
REGISTERED GEOLOGIST
2014000148
October 18, 2017

SUBJECT: Site characterization for existing CCR impoundments
Asbury Power Plant Site Characterization Work Plan- CCR
37 21 22.66 Latitude, -94 35 4.79 Longitude,
Jasper County, Missouri

The Missouri Geological Survey (MGS) has reviewed the documents titled, 'NPDES Permit MO-0095362 Asbury Power Plant, Jasper County, Missouri, Site Characterization Work Plan', prepared by Empire District Electric Company, dated September 8, 2017 and 'Site Characterization Work Plan, Coal Combustion Residuals Impoundments, Empire Electric Facility - Permit MO-0095362, Jasper County, Missouri, Geotechnology Project No. J021738.03', prepared by Geotechnology Inc., dated May 16, 2017. The MGS offers the following comment.

General Comment:

The MGS agrees that the existing Coal Combustion Residuals (CCR) impoundments (site 1) do not need further site characterization, at this time. The site characterization performed, as described in the Detailed Site Investigation Report (DSI), dated January 21, 2015, at the proposed CCR impoundment (site 2) that is approximately 1,000 feet south of the existing CCR impoundments (site 1), coupled with the geologic and hydrologic data provided that pertains to the existing CCR impoundments (site 1) (1996 to present data), provides adequate characterization of the geology and hydrology of the site 1. The geologic and hydrologic settings of both sites are similar, with geologic boring logs and potentiometric data of both sites being compared. The hydraulic conductivity testing conducted at the proposed CCR site (site 2) has demonstrated that there is a low potential for groundwater contamination for this area.

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2161.

APPENDIX 2

Baseline Sampling Information

EPA CCR Rule

Appendix III to Part 257—Constituents for Detection Monitoring

Boron
Calcium
Chloride
Fluoride
pH
Sulfate
Total Dissolved Solids (TDS)

Appendix IV to Part 257—Constituents for Assessment Monitoring

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 and 228 combined

1st Baseline Event –
January 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.33	<0.5 J	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J
Calcium	mg/L	NA	57	74	220	84	200	250	140	570
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38
Fluoride	mg/L	4	0.43	0.47	0.31	0.28	0.30	0.24	0.35	<0.2 J
pH	SU	NA	6.33	5.81	6.31	7.33	7.09	6.97	7.09	6.51
Sulfate	mg/L	NA	260	360	1100	140	800	1000	600	1800
Total Dissolved Solids	mg/L	NA	690	790	1900	590	1500	1800	1300	2800
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Arsenic	mg/L	0.01	<0.002 J	0.01	<0.01 J	<0.02 J	<0.01	<0.01	<0.01	<0.01
Barium	mg/L	2	0.044	0.0099	0.065	0.086	0.036	0.02	0.042	0.011
Beryllium	mg/L	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002 J	<0.002 J	<0.01 J	<0.01 J	<0.01 J	<0.01 J	<0.01	<0.01
Cobalt	mg/L	NA	<0.01 J	<0.01 J	0.046	<0.002 J	0.018	0.0022	0.02	0.014
Lead	mg/L	0.015	<0.002 J	<0.002	<0.01 J	<0.002 J	<0.002	<0.002	<0.002	<0.002 J
Lithium	mg/L	NA	0.057	0.15	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002 J	<0.002 J	<0.01 J	<0.002	<0.01 J	<0.002
Selenium	mg/L	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Combined Radium	pCi/L	5	<0.477 J	<0.427 J	<2.08	<0.563 J	<0.392 J	<0.446 J	<0.306 J	<0.279 J

NA = Not Applicable

<x = Less than reporting limit (nondetectable)

J = Trace value seen above minimum detection limit but below reporting limit (trace)

2nd Baseline Event –
March 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.90	0.060	<0.25	0.29	0.29	0.34	0.34	0.29
Calcium	mg/L	NA	120	92	260	94	190	250	160	620
Chloride	mg/L	NA	180	70	15	4.4	23	9.0	36	34
Fluoride	mg/L	4	0.28	0.28	0.10	0.38	0.31	0.23	0.31	0.16
pH	SU	NA	5.82	5.68	6.72	7.15	6.94	6.79	6.98	6.22
Sulfate	mg/L	NA	570	400	570	140	710	970	550	1800
Total Dissolved Solids	mg/L	NA	1300	840	1600	590	1500	1800	1200	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002 J	<0.002	<0.002 J	<0.002
Arsenic	mg/L	0.01	<0.002 J	0.024	0.0038	<0.002 J	0.0038	0.0026	0.0025	0.004
Barium	mg/L	2	0.060	0.012	0.034	0.047	0.042	0.026	0.051	0.0089
Beryllium	mg/L	0.004	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	0.005	0.0028	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002 J	0.0034	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.017	0.0095	0.021	<0.002 J	0.02	0.0061	0.0063	0.016
Lead	mg/L	0.015	<0.002 J	<0.002 J	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002
Lithium	mg/L	NA	0.20	0.15	0.074	0.074	0.14	0.22	0.14	0.30
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002	<0.002 J	0.0041	<0.002 J	0.0038	<0.002
Selenium	mg/L	0.05	<0.002	<0.002	<0.002	0.0021	0.0028	0.0031	0.0031	<0.002
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Combined Radium	pCi/L	5	<0.337 J	<0.389 J	<0.84 J	<0.315 J	<0.336 J	<0.319 J	<0.348 J	<0.329 J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

3rd Baseline Event –
May 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.21	0.044	0.027	0.24	0.26	0.25	0.23	0.29
Calcium	mg/L	NA	130	100	91	5	59	11	90	36
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38
Fluoride	mg/L	4	0.28	0.27	0.22	0.55	0.35	0.26	0.43	0.18
pH	SU	NA	5.30	4.37	5.97	6.43	6.60	6.51	6.64	5.82
Sulfate	mg/L	NA	160	540	820	150	920	1400	620	2400
Total Dissolved Solids	mg/L	NA	500	800	1700	590	1500	1800	1100	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Arsenic	mg/L	0.01	0.0013	0.027	0.01	0.0043	0.01	0.007	0.0037	0.0082
Barium	mg/L	2	0.021	0.01	0.025	0.045	0.037	0.041	0.04	0.021
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002 J	<0.002 J	0.0025	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Cobalt	mg/L	NA	0.0072	0.0073	0.0071	<0.0005J	0.00081	0.0035	<0.0005J	0.0037
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001 J
Lithium	mg/L	NA	<0.05 J	0.15	<0.05 J	0.074	0.16	0.31	0.12	0.22
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0052	<0.005	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005 J	<0.005	<0.005
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	<0.001
Combined Radium	pCi/L	5	<0.355	<0.427 J	<0.386 J	<0.402 J	<0.377 J	<0.357 J	<0.334 J	<0.333 J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

4th Baseline Event –
August 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.19	0.057	0.067	0.27	0.27	0.29	0.27	0.22
Calcium	mg/L	NA	38	79	110	74	180	220	130	430
Chloride	mg/L	NA	120	77	35	6	35	12	65	49
Fluoride	mg/L	4	0.25	0.15	0.3	0.26	0.31	0.23	0.37	0.22
pH	SU	NA	6.04	5.73	7	7.17	7.04	6.88	7.14	6.29
Sulfate	mg/L	NA	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005	<0.005 J	<0.005 J
Total Dissolved Solids	mg/L	NA	460	850	730	540	1500	1800	1100	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Arsenic	mg/L	0.01	<0.001 J	0.013	<0.001 J	<0.001 J	0.001	<0.001 J	<0.001 J	<0.001 J
Barium	mg/L	2	0.023	<0.01 J	0.012	0.035	0.031	0.014	0.037	<0.01 J
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0052	0.0088	0.0038	<0.0005J	0.00075	<0.0005J	<0.0005J	0.015
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001
Lithium	mg/L	NA	<0.05 J	0.16	<0.05 J	0.078	0.16	0.22	0.11	0.34
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	<0.005	0.0067	<0.005
Selenium	mg/L	0.05	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005	<0.005 J	<0.005 J
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.424 J	<0.465 J	<0.833	<0.441 J	<0.435 J	<0.45 J	<0.484 J	<0.418 J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

5th Baseline Event –
October 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.2	0.053	0.047	0.24	0.33	0.34	0.31	0.26
Calcium	mg/L	NA	43	91	100	94	220	260	130	490
Chloride	mg/L	NA	130	65	74	6	29	13	65	56
Fluoride	mg/L	4	0.28	0.18	0.28	0.31	0.39	0.25	0.41	0.28
pH	SU	NA	6.59	5.95	7.21	7.51	8.00	6.98	7.85	6.75
Sulfate	mg/L	NA	99	470	120	120	1100	1100	570	1400
Total Dissolved Solids	mg/L	NA	460	850	580	570	1500	1700	1100	2800
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002 J	<0.002
Arsenic	mg/L	0.01	<0.001	0.014	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001 J	<0.001 J
Barium	mg/L	2	0.028	<0.01 J	0.02	0.03	0.033	0.013	0.037	<0.01 J
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0051	0.0095	0.0013	0.00073	0.0072	<0.0005J	<0.0005J	0.014
Lead	mg/L	0.015	<0.001 J	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05 J	0.17	<0.05	0.078	0.17	0.24	0.12	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0066	<0.005	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005J	<0.005
Thallium	mg/L	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.436J	<0.478J	<0.535J	<0.503J	<0.498J	<0.464J	<0.453J	<0.424J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

6th Baseline Event –
March 2017 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.22	0.052	0.057	0.23	0.29	0.33	0.36	0.26
Calcium	mg/L	NA	38	93	250	86	200	260	170	500
Chloride	mg/L	NA	130	52	19	5.3	29	11	19	39
Fluoride	mg/L	4	0.21	0.12	<0.1 J	0.29	0.29	0.19	0.3	0.12
pH	SU	NA	6.07	5.84	6.67	7.32	7.38	7.15	7.21	6.40
Sulfate	mg/L	NA	130	540	630	150	1100	1000	720	1900
Total Dissolved Solids	mg/L	NA	500	940	1600	620	1700	1900	1400	3000
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	mg/L	0.01	<0.001	0.037	0.0022	0.0013	0.0014	<0.001 J	0.0043	<0.001 J
Barium	mg/L	2	0.021	0.011	0.021	0.033	0.026	0.015	0.027	<0.01 J
Beryllium	mg/L	0.004	<0.001 J	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001 J
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Cobalt	mg/L	NA	0.0071	0.0097	0.0096	<0.0005J	0.0022	0.0024	0.0017	0.014
Lead	mg/L	0.015	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05 J	0.17	0.072	0.076	0.16	0.23	0.14	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005 J	<0.005 J	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	mg/L	0.002	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	0.575	1.63	0.287	1.50	0.803	2.68	1.73	1.62

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

7th Baseline Event –
June 2017 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	<0.08J	<0.08J	0.034	0.27	0.31	0.37	0.36	0.26
Calcium	mg/L	NA	42	100	300	89	200	260	160	470
Chloride	mg/L	NA	130	54	110	5.4	23	12	26	48
Fluoride	mg/L	4	0.43	0.19	0.18	0.35	0.42	0.3	0.42	0.21
pH	SU	NA	6.35	5.78	6.62	7.22	7.04	6.93	7.09	6.41
Sulfate	mg/L	NA	78	650	1400	180	940	1300	780	2400
Total Dissolved Solids	mg/L	NA	450	950	2000	610	1600	1800	1400	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	mg/L	0.01	<0.001J	0.1	0.0032	<0.001J	0.0037	<0.001	0.0018	<0.001
Barium	mg/L	2	0.03	0.016	0.048	0.04	0.026	0.017	0.025	<0.01J
Beryllium	mg/L	0.004	<0.001	0.0031	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002	<0.002J	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.004	0.0088	0.0042	<0.0005J	0.0045	0.00087	0.0059	0.0015
Lead	mg/L	0.015	0.0033	0.001	0.0074	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05J	0.18	0.053	0.085	0.18	0.25	0.15	0.34
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005	<0.005J	<0.005	<0.005J	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	mg/L	0.002	<0.001	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.397J	<0.337J	<0.403	<0.291J	<0.343J	<0.414J	<0.33J	<0.314J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

8th Baseline Event –
August 2017 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.28	0.33	0.34	0.38	0.27
Calcium	mg/L	NA	43	98	83	57	220	250	180	510
Chloride	mg/L	NA	130	45	8.1	5.3	23	12	26	38
Fluoride	mg/L	4	0.26	0.17	0.32	0.27	0.45	0.25	0.4	0.22
pH	SU	NA	6.2	5.7	6.7	7.3	7.0	7.2	7.1	6.3
Sulfate	mg/L	NA	82	550	63	140	920	1100	730	2200
Total Dissolved Solids	mg/L	NA	450	960	450	530	1600	1800	1400	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002
Arsenic	mg/L	0.01	<0.001J	0.013	<0.001J	0.002	<0.001J	<0.001J	<0.001J	<0.001J
Barium	mg/L	2	0.024	0.01	0.018	0.027	0.023	0.018	0.021	<0.01J
Beryllium	mg/L	0.004	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001J
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002J	<0.002	0.0026	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0036	0.01	0.00067	<0.0005J	0.0023	<0.0005J	0.0051	0.014
Lead	mg/L	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05J	0.17	<0.05J	0.073	0.18	0.22	0.15	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005J	<0.005J	<0.005J	<0.005J	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	mg/L	0.002	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.42J	<0.417J	<0.473	<0.476J	<0.383J	<0.389J	<0.291J	<0.346J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

APPENDIX 3

Monitoring Well Field Inspection Sheets and Field Notes

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 2

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2200 mL post pump calibration.

Date / Time Initiated: 5 - 13 -20 @ 12:20 Date / Time Completed: 5 - 13 -20 @

Well Purged To Dryness?: Y / (N) Petroleum or Gas Detected? Y / (N)

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
12:26	200	1200		7.03					
28		1600		6.88					
30		2000		6.75					
32		2200		6.77					

Time sampled 12:35

Weather Conditions Cloudy Low 50's

Water Level Start 1.04'

Water Level Finish 3.20'

Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	(G)	F	P
Pad Condition	(G)	F	P
Casing Condition	(G)	F	P
Locking Cap & Lock	(G)	F	P
Riser Condition	(G)	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	(Y)	N	N/A
Standing Water	Y	(N)	N/A
Clear of Weeds	Y	(N)	N/A
Measuring Point	(Y)	N	N/A
Split sample with MDNR	Y	(N)	N/A
Maintenance Performed	Y	(N)	N/A
Decontamination Normal	(Y)	N	N/A
Equipment Calibration Normal	(Y)	N	N/A
Redevelopment Needed	Y	(N)	N/A
Any deviations from SAP	Y	(N)	N/A
Sediment Thickness Checked	Y	(N)	N/A

Historical Data: Average of sampling events

Constituent	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

X

Field Sampling Log

Facility: Asbury CCR (Permit #)

Monitoring Well ID: MW- 3

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2200 mL post pump calibration.

Date / Time Initiated: 5 – 12 -20 @ 11:58 Date / Time Completed: 5 – 12 -20 @

Well Purged To Dryness?: Y / (N) Petroleum or Gas Detected? Y / (N)

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
12:03	200	1000	9.05	5.73	1.212	5.82	-135.2		C
:05		1400	8.98	5.75	1.218	4.36	-126.4		
:07		1800	8.95	5.77	1.222	3.47	-123.1		
:09		2200	8.93	5.77	1.224	2.82	-123.5		↓

Time sampled 12:10

Weather Conditions Cloudy Windy 40's

Water Level Start 0.00'

Water Level Finish 0.50'

Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 4

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2000 mL post pump calibration.

Date / Time Initiated: 5 – 13 -20 @ 11:54 Date / Time Completed: 5 – 13 -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
11:58	200	800		6.38					
12:00		1200		6.39					
:02		1600		6.47					
:04		2000		6.49					

Time sampled 12:05

Weather Conditions Cloudy Low 50's

Water Level Start 5.26'

Water Level Finish 9.94'

Name (MEC Field Sampler): Ryan Ornbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW-5

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2000 mL post pump calibration.

Date / Time Initiated: 5 – 13 -20 @ 10:54 Date / Time Completed: 5 – 13 -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
10:58	200	800		6.60					
11:00		1200		6.49					
:02		1600		6.55					
:04		2000		6.59					

Time sampled 11:05

Weather Conditions Cloudy Wd 50's

Water Level Start 0.99'

Water Level Finish 6.02'

Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 5A

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2000 mL post pump calibration.

Date / Time Initiated: 5 – 13 -20 @ 10:30 Date / Time Completed: 5 – 13 -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
10:35	200	800		6.12					C
:37		1200		6.20					
:39		1600		6.30					
:41		2000		6.28					

Time sampled 10:45

Weather Conditions Cloudy Low 50's

Water Level Start 8.38'

Water Level Finish 15.81'

Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 6

Sample [X] Blind Duplicate [ ] Field Blank [X]

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing** 11:30

Actual Purge Volume Removed: 2200 mL post pump calibration.

Date / Time Initiated: 5 – 13 -20 @ 10:08 Date / Time Completed: 5 – 13 -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
11:13	200	1000		6.06					
:15		1400		6.21					
:17		1800		6.35					
:19		2200		6.33					

Time sampled 11:20

Weather Conditions Cloudy Low 50's

Water Level Start 8.11'

Water Level Finish 12.45'

Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 6A

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 1800 mL post pump calibration.

Date / Time Initiated: 5 – 13 -20 @ 9:48 Date / Time Completed: 5 – 13 -20- @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N no flow-thru meter

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (ml)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
9:51	200	600		6.01					
:53		1000		6.00					
:55		1400		6.07					
:57		1800		6:13					

Time sampled 10:00

Weather Conditions Cloudy Low 50's

Water Level Start 7.38'

Water Level Finish 11.78'

Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events for: 5/16 + 6/17

Constituent	Units	MW- 6A	MW-7					
pH	S.U.	6.87	6.12					
Specific Conductance	umhos/cm	1.601	2.699					
Total Well Depth	ft							
Average GW Depth	ft	7.28	3.04					
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	800	800					

X

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 7

Sample [X] Blind Duplicate [X] Field Blank [ ]. 9:30

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2000 mL post pump calibration.

Date / Time Initiated: 5 – 13 -20 @ 7:54 8:06 Date / Time Completed: 5 – 13 -20- @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N fixed elec. connect

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (ml)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
8:10	200	800	9.82	6.34	2.698	2.06	-160.9		C
:12		1200	9.87	6.31	2.697	2.19	-160.3		
:14		1600	9.91	6.31	2.703	3.22	-148.5		
:16		2000	9.91	6.30	2.717	3.24	-145.3		

Time sampled 8:20

Weather Conditions Cloudy 100's 50's

Water Level Start 2.56'

Water Level Finish 2.74'

Name (MEC Field Sampler): Ryan Ortbals and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events for: 5/16 + 6/17

Constituent	Units	MW- 6A	MW-7					
pH	S.U.	6.87	6.12					
Specific Conductance	umhos/cm	1.601	2.699					
Total Well Depth	ft							
Average GW Depth	ft	7.28	3.04					
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	800	800					

Asbury Landfill and Pond Groundwater Sampling Events
Supplementary Field notes
May 11, 12 and 13, 2020

On May 11, 2020, Ryan Ortbals and Rick Elgin mobilized to the Asbury Landfill to initiate the Groundwater Sampling Event and completed on May 12, 2020 with no major issues other than wet and rainy. In addition, we were able to sample one (1) monitoring well (MW-3) of the Asbury Pond to complete the day on May 12th.

On May 13, 2020 (raining), we initiated the groundwater sampling activities for the remaining monitoring wells at the Asbury Pond. At the first monitoring well (MW-7) for the days' activities, the flow-through meter slid off the front of the truck and struck my foot and landed onto the ground. The jarring of the meter shut it off. We were unable to get the meter turned back on. We changed out the batteries with new batteries but that did not get the meter restarted. We attempted to dry the battery points and assured a good contact between the meter and the batteries. The meter still did not turn back on. We contacted the rental equipment supplier and ordered another meter to be shipped to the MEC office.

Part of the equipment that we took to the Asbury sites was a portable pH meter from our equipment inventory. Continuing forward with the sampling event, the groundwater pH readings taken with the portable pH meter were within the normal range of historical sampling events. We utilized only the pH reading for this sampling event to establish stability prior to sample collection, with the exception of MW-3 that was collected on May 12, 2020.

We returned the malfunctioning flow-through cell and meter once the replacement equipment had arrived at MEC.

Rick Elgin

APPENDIX 4

Analytical Results from Lab

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-105771-1
Client Project/Site: Asbury Ash Pond
Sampling Event: Asbury Ash Pond

For:
Midwest Environmental Consultants
2009 East McCarty Street
Suite 2
Jefferson City, Missouri 65101

Attn: Mr. Rick Elgin

CathyGartner

Authorized for release by:
6/2/2020 2:06:21 PM

Cathy Gartner, Project Manager II
(615)301-5041
cathy.gartner@testamericainc.com

PA Lab ID: 02-00416

Table of Contents

Job ID: 180-105771-1

Laboratory: Eurofins TestAmerica, Pittsburgh

Narrative

Job Narrative
180-105771-1

Receipt
The samples were received on 5/14/2020 9:00 AM; the samples arrived in good condition, properly preserved, and where required, on ice. The temperature of the cooler at receipt time was 4.2°C

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Accreditation/Certification Summary

Client: Midwest Environmental Consultants
Job ID: 180-105771-1
Project/Site: Asbury Ash Pond

Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
California	State	2891	04-30-21
Connecticut	State	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Georgia	State	PA 02-00416	04-30-21
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	01-31-21
Kentucky (UST)	State	162013	04-30-21
Kentucky (WW)	State	KY98043	12-31-20
Louisiana	NELAP	04041	06-30-20
Maine	State	PA00164	03-06-22
Minnesota	NELAP	042-999-482	12-31-20
Nevada	State	PA00164	07-31-20
New Hampshire	NELAP	2030	04-05-21
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	04-01-21
North Carolina (WW/SW)	State	434	01-01-21
North Dakota	State	R-227	04-30-21
Oregon	NELAP	PA-2151	02-06-21
Pennsylvania	NELAP	02-00416	04-30-21
Rhode Island	State	LAO00362	12-31-20
South Carolina	State	89014	04-30-20 *
Texas	NELAP	T104704528	03-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Virginia	NELAP	10043	09-15-20
West Virginia DEP	State	142	02-01-21
Wisconsin	State	998027800	08-31-20

Laboratory: Eurofins TestAmerica, Nashville

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arizona	State Program	AZ0473	05-05-14 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-105771-1	MW-2	Water	05/13/20 12:20	05/14/20 09:00	
180-105771-2	MW-3	Water	05/12/20 12:10	05/14/20 09:00	
180-105771-3	MW-4	Water	05/13/20 12:05	05/14/20 09:00	
180-105771-4	MW-5	Water	05/13/20 11:05	05/14/20 09:00	
180-105771-5	MW-5A	Water	05/13/20 10:45	05/14/20 09:00	
180-105771-6	MW-6	Water	05/13/20 11:20	05/14/20 09:00	
180-105771-7	MW-6A	Water	05/13/20 10:00	05/14/20 09:00	
180-105771-8	MW-7	Water	05/13/20 08:20	05/14/20 09:00	
180-105771-9	Duplicate	Water	05/13/20 08:30	05/14/20 09:00	
180-105771-10	Field Blank	Water	05/13/20 11:30	05/14/20 09:00	

Method Summary

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-2
Date Collected: 05/13/20 12:20
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			317023	06/01/20 10:20	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 01:57	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:21	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-3
Date Collected: 05/12/20 12:10
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			317023	06/01/20 10:52	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		5			317023	06/01/20 11:08	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:14	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:24	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315580	05/15/20 09:22	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-4
Date Collected: 05/13/20 12:05
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			317023	06/01/20 11:23	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			317023	06/01/20 11:39	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:18	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:26	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-5

Date Collected: 05/13/20 11:05
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			316984	05/30/20 20:20	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:21	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:27	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-5A

Date Collected: 05/13/20 10:45
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			316984	05/30/20 22:11	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		25			316984	05/30/20 22:27	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:25	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:29	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-6

Date Collected: 05/13/20 11:20
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			316984	05/30/20 22:43	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			317023	06/01/20 07:57	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:35	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:30	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-6A

Date Collected: 05/13/20 10:00
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			317023	06/01/20 08:13	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		10			317023	06/01/20 08:29	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:39	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:32	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-7

Date Collected: 05/13/20 08:20
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			317023	06/01/20 08:45	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		25			317023	06/01/20 09:00	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:42	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:33	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: Duplicate

Date Collected: 05/13/20 08:30
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			317023	06/01/20 09:16	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total/NA	Analysis	EPA 9056A		25			317023	06/01/20 09:32	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:46	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:35	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: Field Blank

Date Collected: 05/13/20 11:30
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			316984	05/30/20 20:04	MJH	TAL PIT
	Instrument ID: CHIC2100A									
Total Recoverable	Prep	3005A			50 mL	50 mL	316211	05/21/20 17:02	JL	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			316446	05/24/20 02:49	RJR	TAL PIT
	Instrument ID: DORY									
Total/NA	Analysis	EPA 9040C		1			316815	05/28/20 17:38	PMH	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315655	05/16/20 07:17	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Analyst References:

Lab: TAL PIT

Batch Type: Prep

JL = James Lyu

Batch Type: Analysis

AVS = Abbey Smith
MJH = Matthew Hartman
PMH = Paloma Hoelzle
RJR = Ron Rosenbaum

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-2

Date Collected: 05/13/20 12:20
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-1

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	110		1.0	0.32	mg/L			06/01/20 10:20	1
Fluoride	0.42		0.10	0.026	mg/L			06/01/20 10:20	1
Sulfate	46		1.0	0.38	mg/L			06/01/20 10:20	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	38		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 01:57	1
Boron	0.16		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 01:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	560		10	10	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1	0.1	SU			05/28/20 17:21	1

Client Sample Results

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-3

Date Collected: 05/12/20 12:10
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-2

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	57		1.0	0.32	mg/L			06/01/20 10:52	1
Fluoride	0.17		0.10	0.026	mg/L			06/01/20 10:52	1
Sulfate	460		5.0	1.9	mg/L			06/01/20 11:08	5

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	100		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:14	1
Boron	0.10		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	910		10	10	mg/L			05/15/20 09:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.9	HF	0.1	0.1	SU			05/28/20 17:24	1

Client Sample Results

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-4

Date Collected: 05/13/20 12:05
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-3

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.7		1.0	0.32	mg/L			06/01/20 11:23	1
Fluoride	0.12		0.10	0.026	mg/L			06/01/20 11:23	1
Sulfate	540		10	3.8	mg/L			06/01/20 11:39	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	270		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:18	1
Boron	0.067	J	0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		10	10	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1	0.1	SU			05/28/20 17:26	1

Client Sample Results

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-5

Date Collected: 05/13/20 11:05
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-4

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.8		1.0	0.32	mg/L			05/30/20 20:20	1
Fluoride	0.34		0.10	0.026	mg/L			05/30/20 20:20	1
Sulfate	130		1.0	0.38	mg/L			05/30/20 20:20	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	100		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:21	1
Boron	0.27		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	570		10	10	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			05/28/20 17:27	1

Client: Midwest Environmental Consultants
Job ID: 180-105771-1
Project/Site: Asbury Ash Pond

Client Sample ID: MW-5A
Lab Sample ID: 180-105771-5
Date Collected: 05/13/20 10:45
Matrix: Water
Date Received: 05/14/20 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	75		2.5	0.80	mg/L			05/30/20 22:11	2.5
Fluoride	0.45		0.25	0.066	mg/L			05/30/20 22:11	2.5
Sulfate	1200		25	9.5	mg/L			05/30/20 22:27	25

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	260		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:25	1
Boron	0.91		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2100		20	20	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.9	HF	0.1	0.1	SU			05/28/20 17:29	1

Client: Midwest Environmental Consultants
Job ID: 180-105771-1
Project/Site: Asbury Ash Pond

Client Sample ID: MW-6
Lab Sample ID: 180-105771-6
Date Collected: 05/13/20 11:20
Matrix: Water
Date Received: 05/14/20 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14		1.0	0.32	mg/L			05/30/20 22:43	1
Fluoride	0.27		0.10	0.026	mg/L			05/30/20 22:43	1
Sulfate	880		10	3.8	mg/L			06/01/20 07:57	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	250		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:35	1
Boron	0.32		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1600		10	10	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			05/28/20 17:30	1

Client Sample Results

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: MW-6A

Date Collected: 05/13/20 10:00
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-7

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	19		1.0	0.32	mg/L			06/01/20 08:13	1
Fluoride	0.34		0.10	0.026	mg/L			06/01/20 08:13	1
Sulfate	710		10	3.8	mg/L			06/01/20 08:29	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	190		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:39	1
Boron	0.42		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1400		10	10	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.4	HF	0.1	0.1	SU			05/28/20 17:32	1

Client: Midwest Environmental Consultants
Job ID: 180-105771-1
Project/Site: Asbury Ash Pond

Client Sample ID: MW-7
Lab Sample ID: 180-105771-8
Date Collected: 05/13/20 08:20
Matrix: Water
Date Received: 05/14/20 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	44		2.5	0.80	mg/L			06/01/20 08:45	2.5
Fluoride	0.24	J	0.25	0.066	mg/L			06/01/20 08:45	2.5
Sulfate	1600		25	9.5	mg/L			06/01/20 09:00	25

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	480		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:42	1
Boron	0.26		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2800		20	20	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.6	HF	0.1	0.1	SU			05/28/20 17:33	1

Client Sample Results

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: Duplicate

Date Collected: 05/13/20 08:30
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-9

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	41		2.5	0.80	mg/L			06/01/20 09:16	2.5
Fluoride	0.27		0.25	0.066	mg/L			06/01/20 09:16	2.5
Sulfate	1600		25	9.5	mg/L			06/01/20 09:32	25

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	500		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:46	1
Boron	0.27		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2700		20	20	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.6	HF	0.1	0.1	SU			05/28/20 17:35	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-105771-1

Client Sample ID: Field Blank

Date Collected: 05/13/20 11:30
Date Received: 05/14/20 09:00

Lab Sample ID: 180-105771-10

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.3		1.0	0.32	mg/L			05/30/20 20:04	1
Fluoride	0.67		0.10	0.026	mg/L			05/30/20 20:04	1
Sulfate	0.41	J	1.0	0.38	mg/L			05/30/20 20:04	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	0.36	J	0.50	0.13	mg/L		05/21/20 17:02	05/24/20 02:49	1
Boron	0.054	J	0.080	0.039	mg/L		05/21/20 17:02	05/24/20 02:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10		10	10	mg/L			05/16/20 07:17	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1	0.1	SU			05/28/20 17:38	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-316984/45
Matrix: Water
Analysis Batch: 316984

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			05/30/20 19:49	1
Fluoride	ND		0.10	0.026	mg/L			05/30/20 19:49	1
Sulfate	ND		1.0	0.38	mg/L			05/30/20 19:49	1

Lab Sample ID: LCS 180-316984/44
Matrix: Water
Analysis Batch: 316984

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	52.3		mg/L		105	80 - 120
Fluoride	2.50	2.60		mg/L		104	80 - 120
Sulfate	50.0	48.2		mg/L		96	80 - 120

Lab Sample ID: 180-106396-D-1 MS
Matrix: Water
Analysis Batch: 316984

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1.9		50.0	47.9		mg/L		92	80 - 120
Fluoride	0.21		2.50	2.50		mg/L		92	80 - 120
Sulfate	26		50.0	66.5		mg/L		82	80 - 120

Lab Sample ID: 180-106396-D-1 MSD
Matrix: Water
Analysis Batch: 316984

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1.9		50.0	47.8		mg/L		92	80 - 120	0	15
Fluoride	0.21		2.50	2.46		mg/L		90	80 - 120	2	15
Sulfate	26		50.0	65.7		mg/L		80	80 - 120	1	15

Lab Sample ID: MB 180-317023/6
Matrix: Water
Analysis Batch: 317023

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			06/01/20 06:38	1
Fluoride	ND		0.10	0.026	mg/L			06/01/20 06:38	1
Sulfate	ND		1.0	0.38	mg/L			06/01/20 06:38	1

Lab Sample ID: LCS 180-317023/5
Matrix: Water
Analysis Batch: 317023

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	51.8		mg/L		104	80 - 120
Fluoride	2.50	2.60		mg/L		104	80 - 120
Sulfate	50.0	48.2		mg/L		96	80 - 120

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: 180-105952-C-1 MS
Matrix: Water
Analysis Batch: 317023

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	3.8		50.0	53.4		mg/L		99	80 - 120
Fluoride	0.076	J	2.50	2.59		mg/L		100	80 - 120
Sulfate	9.8		50.0	55.5		mg/L		91	80 - 120

Lab Sample ID: 180-105952-C-1 MSD
Matrix: Water
Analysis Batch: 317023

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	3.8		50.0	53.0		mg/L		98	80 - 120	1	15
Fluoride	0.076	J	2.50	2.60		mg/L		101	80 - 120	0	15
Sulfate	9.8		50.0	55.3		mg/L		91	80 - 120	0	15

Method: EPA 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-316211/1-A
Matrix: Water
Analysis Batch: 316446

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 316211

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		0.50	0.13	mg/L		05/21/20 17:02	05/24/20 01:36	1
Boron	ND		0.080	0.039	mg/L		05/21/20 17:02	05/24/20 01:36	1

Lab Sample ID: LCS 180-316211/2-A
Matrix: Water
Analysis Batch: 316446

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 316211

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	25.0	27.6		mg/L		111	80 - 120
Boron	1.25	1.17		mg/L		94	80 - 120

Lab Sample ID: 180-105771-1 MS
Matrix: Water
Analysis Batch: 316446

Client Sample ID: MW-2
Prep Type: Total Recoverable
Prep Batch: 316211

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	38		25.0	67.4		mg/L		116	75 - 125
Boron	0.16		1.25	1.27		mg/L		89	75 - 125

Lab Sample ID: 180-105771-1 MSD
Matrix: Water
Analysis Batch: 316446

Client Sample ID: MW-2
Prep Type: Total Recoverable
Prep Batch: 316211

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	38		25.0	65.7		mg/L		109	75 - 125	3	20
Boron	0.16		1.25	1.30		mg/L		91	75 - 125	2	20

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-316815/1
Matrix: Water
Analysis Batch: 316815

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: 180-105771-1 DU
Matrix: Water
Analysis Batch: 316815

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.7	HF		6.7		SU				0.3	2

Lab Sample ID: 180-105771-10 DU
Matrix: Water
Analysis Batch: 316815

Client Sample ID: Field Blank
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.7	HF		6.6		SU				0.9	2

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-315580/2
Matrix: Water
Analysis Batch: 315580

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/15/20 09:22	1

Lab Sample ID: LCS 180-315580/1
Matrix: Water
Analysis Batch: 315580

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			269	228		mg/L		85	80 - 120		

Lab Sample ID: 180-105734-B-1 DU
Matrix: Water
Analysis Batch: 315580

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	250			254		mg/L				0.4	10

Lab Sample ID: MB 180-315655/2
Matrix: Water
Analysis Batch: 315655

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			05/16/20 07:17	1

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCS 180-315655/1
Matrix: Water
Analysis Batch: 315655

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			192	222		mg/L		116	80 - 120		

Lab Sample ID: 180-105771-1 DU
Matrix: Water
Analysis Batch: 315655

Client Sample ID: MW-2
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	560			562		mg/L				0.5	10

HPLC/IC

Analysis Batch: 316984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-4	MW-5	Total/NA	Water	EPA 9056A	
180-105771-5	MW-5A	Total/NA	Water	EPA 9056A	
180-105771-5	MW-5A	Total/NA	Water	EPA 9056A	
180-105771-6	MW-6	Total/NA	Water	EPA 9056A	
180-105771-10	Field Blank	Total/NA	Water	EPA 9056A	
MB 180-316984/45	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-316984/44	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-106396-D-1 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-106396-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	

Analysis Batch: 317023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total/NA	Water	EPA 9056A	
180-105771-2	MW-3	Total/NA	Water	EPA 9056A	
180-105771-2	MW-3	Total/NA	Water	EPA 9056A	
180-105771-3	MW-4	Total/NA	Water	EPA 9056A	
180-105771-3	MW-4	Total/NA	Water	EPA 9056A	
180-105771-6	MW-6	Total/NA	Water	EPA 9056A	
180-105771-7	MW-6A	Total/NA	Water	EPA 9056A	
180-105771-7	MW-6A	Total/NA	Water	EPA 9056A	
180-105771-8	MW-7	Total/NA	Water	EPA 9056A	
180-105771-8	MW-7	Total/NA	Water	EPA 9056A	
180-105771-9	Duplicate	Total/NA	Water	EPA 9056A	
180-105771-9	Duplicate	Total/NA	Water	EPA 9056A	
MB 180-317023/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-317023/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-105952-C-1 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-105952-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	

Metals

Prep Batch: 316211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total Recoverable	Water	3005A	
180-105771-2	MW-3	Total Recoverable	Water	3005A	
180-105771-3	MW-4	Total Recoverable	Water	3005A	
180-105771-4	MW-5	Total Recoverable	Water	3005A	
180-105771-5	MW-5A	Total Recoverable	Water	3005A	
180-105771-6	MW-6	Total Recoverable	Water	3005A	
180-105771-7	MW-6A	Total Recoverable	Water	3005A	
180-105771-8	MW-7	Total Recoverable	Water	3005A	
180-105771-9	Duplicate	Total Recoverable	Water	3005A	
180-105771-10	Field Blank	Total Recoverable	Water	3005A	
MB 180-316211/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-316211/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-105771-1 MS	MW-2	Total Recoverable	Water	3005A	
180-105771-1 MSD	MW-2	Total Recoverable	Water	3005A	

Analysis Batch: 316446

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total Recoverable	Water	EPA 6020A	316211

Metals (Continued)

Analysis Batch: 316446 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-2	MW-3	Total Recoverable	Water	EPA 6020A	316211
180-105771-3	MW-4	Total Recoverable	Water	EPA 6020A	316211
180-105771-4	MW-5	Total Recoverable	Water	EPA 6020A	316211
180-105771-5	MW-5A	Total Recoverable	Water	EPA 6020A	316211
180-105771-6	MW-6	Total Recoverable	Water	EPA 6020A	316211
180-105771-7	MW-6A	Total Recoverable	Water	EPA 6020A	316211
180-105771-8	MW-7	Total Recoverable	Water	EPA 6020A	316211
180-105771-9	Duplicate	Total Recoverable	Water	EPA 6020A	316211
180-105771-10	Field Blank	Total Recoverable	Water	EPA 6020A	316211
MB 180-316211/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	316211
LCS 180-316211/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	316211
180-105771-1 MS	MW-2	Total Recoverable	Water	EPA 6020A	316211
180-105771-1 MSD	MW-2	Total Recoverable	Water	EPA 6020A	316211

General Chemistry

Analysis Batch: 315580

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-2	MW-3	Total/NA	Water	SM 2540C	
MB 180-315580/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-315580/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-105734-B-1 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 315655

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total/NA	Water	SM 2540C	
180-105771-3	MW-4	Total/NA	Water	SM 2540C	
180-105771-4	MW-5	Total/NA	Water	SM 2540C	
180-105771-5	MW-5A	Total/NA	Water	SM 2540C	
180-105771-6	MW-6	Total/NA	Water	SM 2540C	
180-105771-7	MW-6A	Total/NA	Water	SM 2540C	
180-105771-8	MW-7	Total/NA	Water	SM 2540C	
180-105771-9	Duplicate	Total/NA	Water	SM 2540C	
180-105771-10	Field Blank	Total/NA	Water	SM 2540C	
MB 180-315655/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-315655/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-105771-1 DU	MW-2	Total/NA	Water	SM 2540C	

Analysis Batch: 316815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1	MW-2	Total/NA	Water	EPA 9040C	
180-105771-2	MW-3	Total/NA	Water	EPA 9040C	
180-105771-3	MW-4	Total/NA	Water	EPA 9040C	
180-105771-4	MW-5	Total/NA	Water	EPA 9040C	
180-105771-5	MW-5A	Total/NA	Water	EPA 9040C	
180-105771-6	MW-6	Total/NA	Water	EPA 9040C	
180-105771-7	MW-6A	Total/NA	Water	EPA 9040C	
180-105771-8	MW-7	Total/NA	Water	EPA 9040C	
180-105771-9	Duplicate	Total/NA	Water	EPA 9040C	
180-105771-10	Field Blank	Total/NA	Water	EPA 9040C	
LCS 180-316815/1	Lab Control Sample	Total/NA	Water	EPA 9040C	

General Chemistry (Continued)

Analysis Batch: 316815 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-105771-1 DU	MW-2	Total/NA	Water	EPA 9040C	
180-105771-10 DU	Field Blank	Total/NA	Water	EPA 9040C	

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: RE & RO	Lab PM: Gartner, Cathy	Carrier Tracking No(s):	COC No: 490-52767-15725.1
Client Contact: Mr. Rick Elgin	Phone: 573-636-9454	E-Mail: cathy.gartner@testamericainc.com		Page: Page 1 of 1
Company: Midwest Environmental Consultants				Job #:

Address: 2009 East McCarty Street Suite 2	Due Date Requested:
City: Jefferson City	TAT Requested (days):
State, Zip: MO, 65101	
Phone: 573-636-9454(Tel)	PO #: Purchase Order not required
Email: relgin@mecpc.com	WO #:
Project Name: Asbury Ash Pond	Project #: 49010011
Site:	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone

180-105771 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056 Chloride, Fluoride, Sulfate	2540C_Calcd - Total Dissolved Solids	6020 Metals - Ca and Boron	TO	Special Instructions/Note:
			Preservation Code:				N	N	D		
MW-2	5-13-20	12:20	G	GW			X	X	X		Field pH: 6.77
MW-3	13	12:10									Field pH: 5.77
MW-4	13	12:05									Field pH: 6.49
MW-5	13	11:05									Field pH: 6.59
MW-5A	13	10:45									Field pH: 6.38
MW-6	13	11:20									Field pH: 6.33
MW-6A	13	10:00									Field pH: 6.13
MW-7	13	8:20									Field pH: 6.30
Dup (MW-7)	13	8:30									Field pH: —
Field Blank	13	11:30	—	—							Field pH: —
											Field pH:

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: 6020A/6010C - Sb,As,Ba,Be,B,Cd,Ca,Cr,Co,Pb,,Mo, Li

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	5-13-20 12:45	MEC	FedEx	5-13-20 12:45	FedEx
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			Heather Watson	5-14-20 9:00	EAPCT
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Midwest Environmental Consultants

Job Number: 180-105771-1

Login Number: 105771
List Number: 1
Creator: Watson, Debbie

List Source: Eurofins TestAmerica, Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX 5

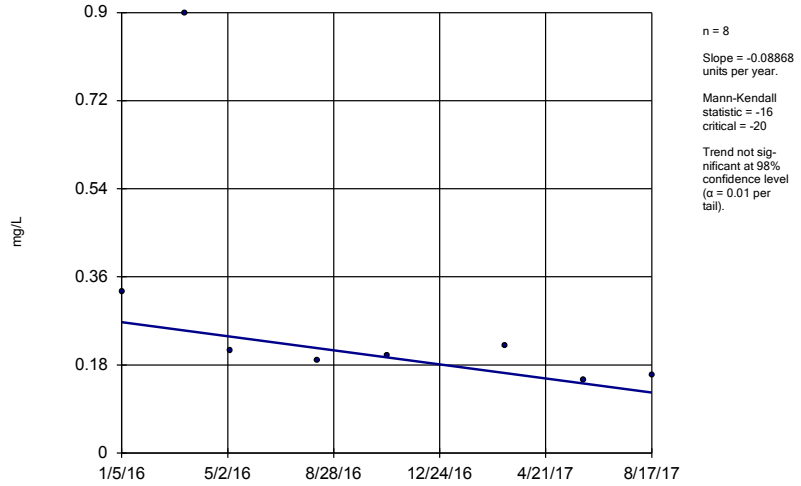
Statistical Analysis

Sanitas™ Output – Background

Trending Analysis

Boron

MW-2 (bg)



n = 8

Slope = -0.08868 units per year.

Mann-Kendall statistic = -16
critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

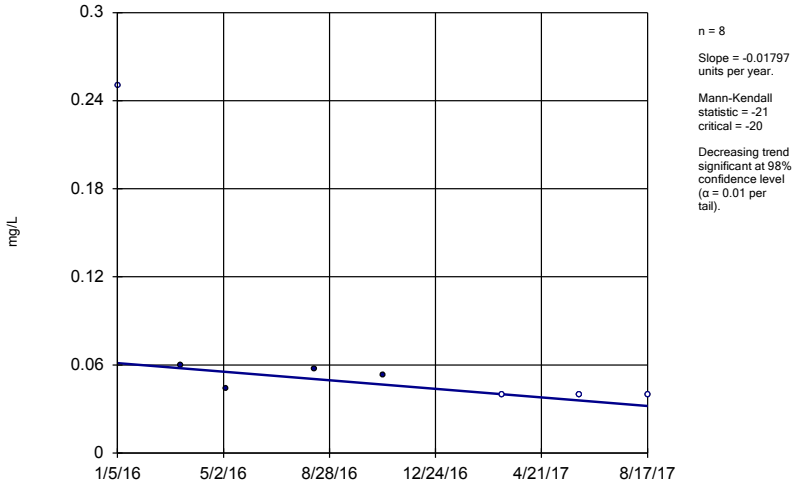
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Boron

MW-3 (bg)



n = 8

Slope = -0.01797 units per year.

Mann-Kendall statistic = -21
critical = -20

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

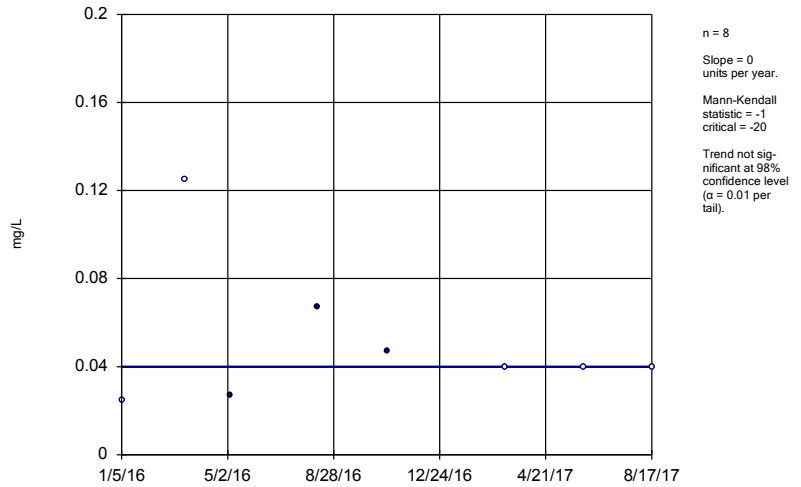
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Boron

MW-4



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -1
critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

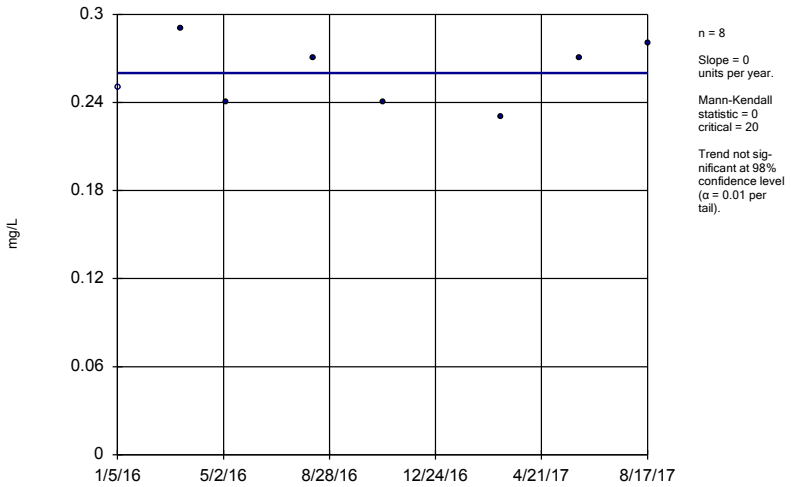
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Boron

MW-5



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

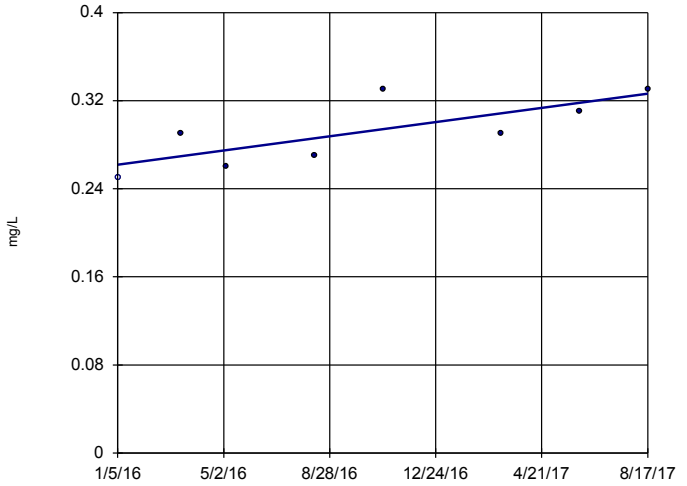
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-5A



n = 8

Slope = 0.03993 units per year.

Mann-Kendall statistic = 18 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

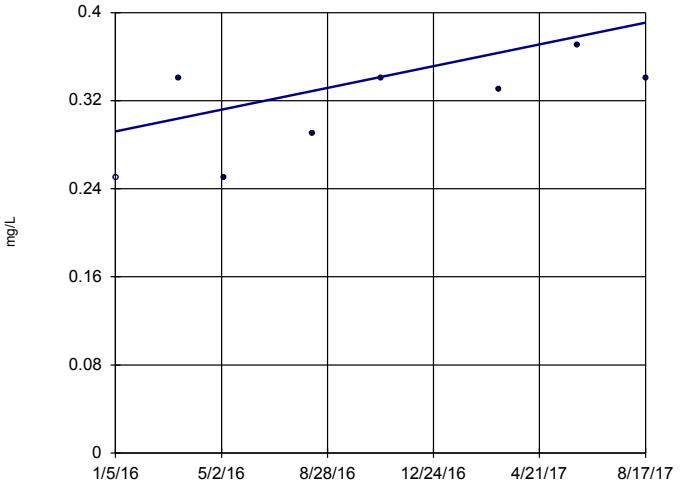
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-6



n = 8

Slope = 0.06117 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

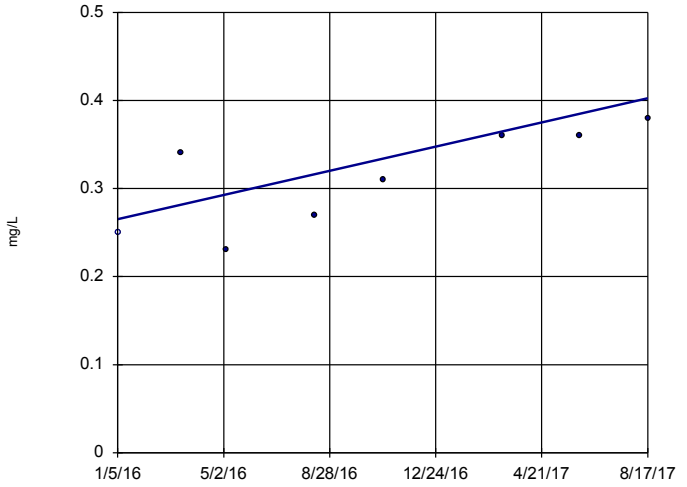
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-6A



n = 8

Slope = 0.08497 units per year.

Mann-Kendall statistic = 19 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

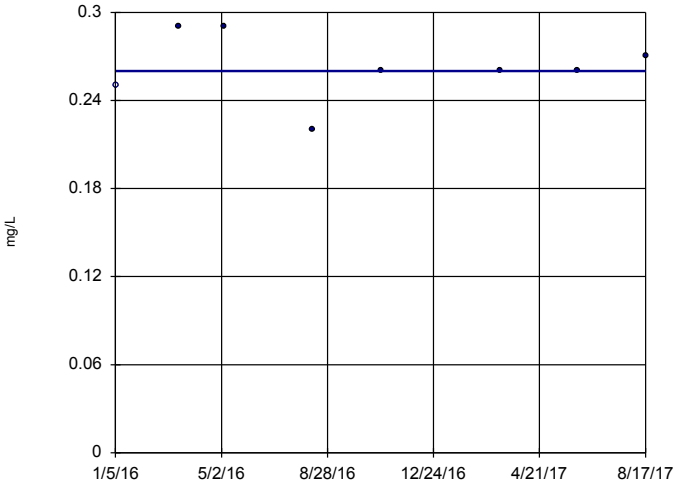
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-7



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 2 critical = 20

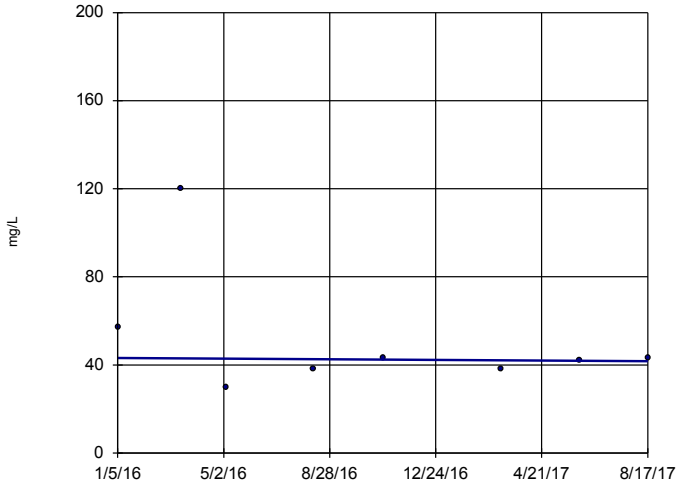
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Calcium

MW-2 (bg)



n = 8

Slope = -0.8333 units per year.

Mann-Kendall statistic = -2 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

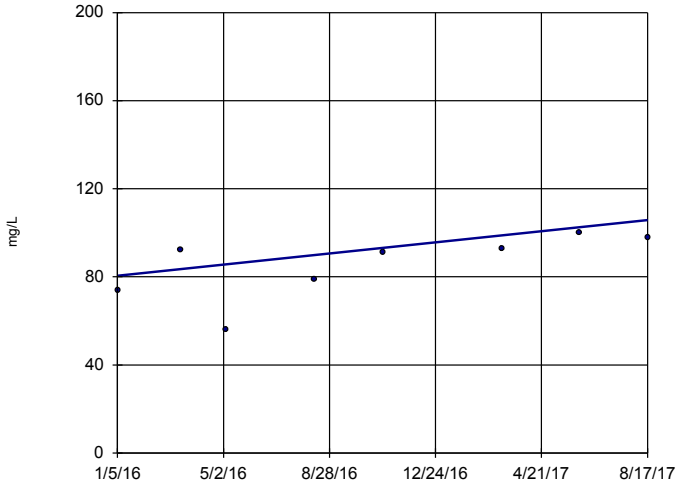
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-3 (bg)



n = 8

Slope = 15.6 units per year.

Mann-Kendall statistic = 18 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

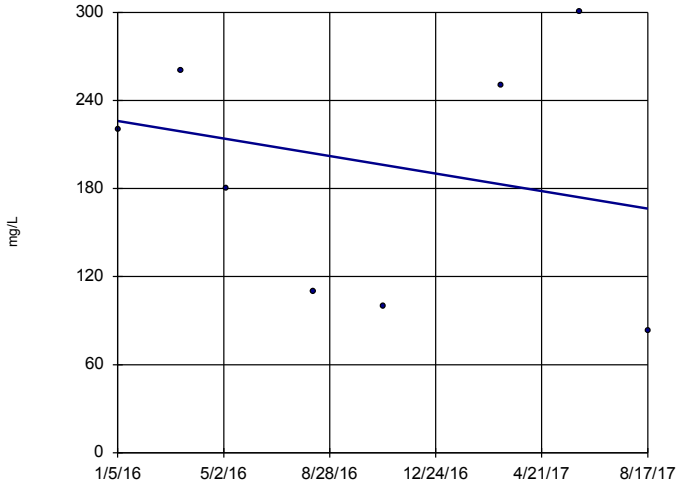
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-4



n = 8

Slope = -36.95 units per year.

Mann-Kendall statistic = -6 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

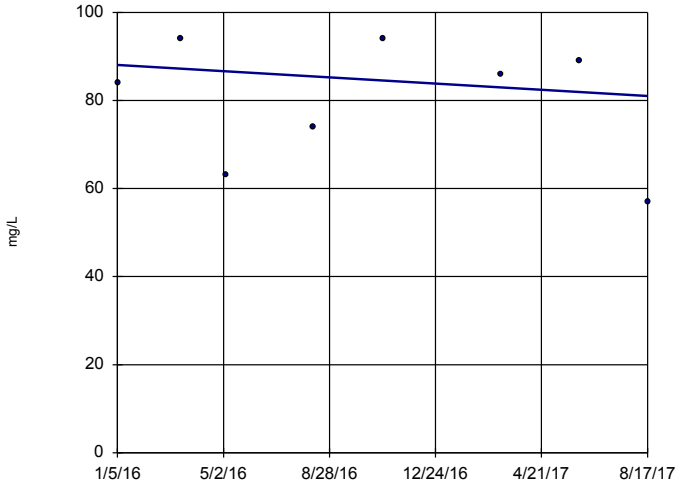
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-5



n = 8

Slope = -4.395 units per year.

Mann-Kendall statistic = -3 critical = -20

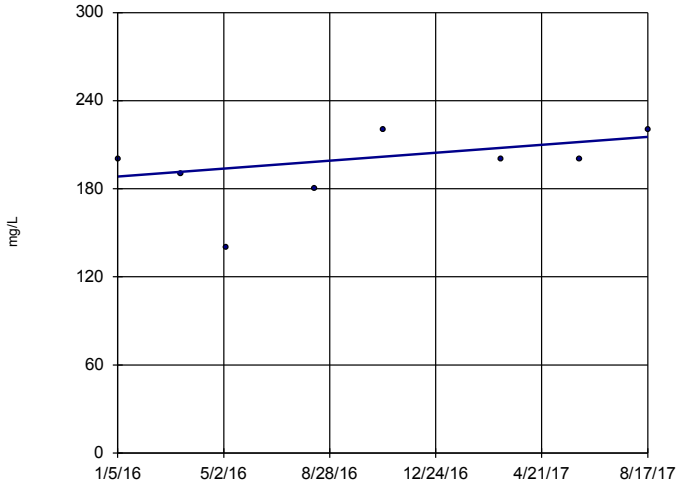
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Calcium

MW-5A



n = 8

Slope = 16.74 units per year.

Mann-Kendall statistic = 10
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

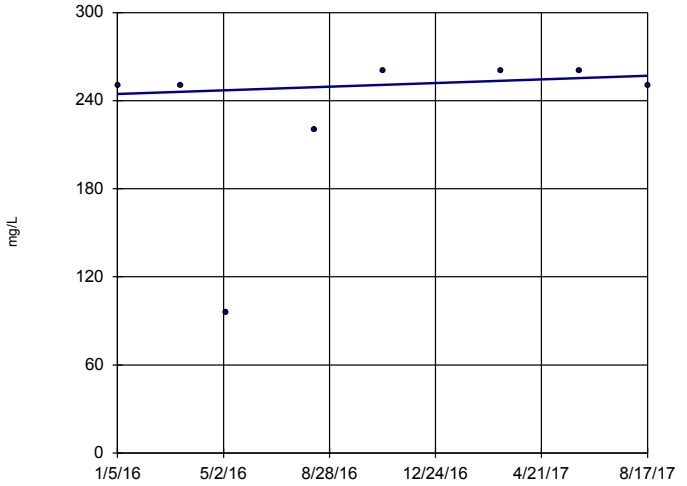
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-6



n = 8

Slope = 7.67 units per year.

Mann-Kendall statistic = 8
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

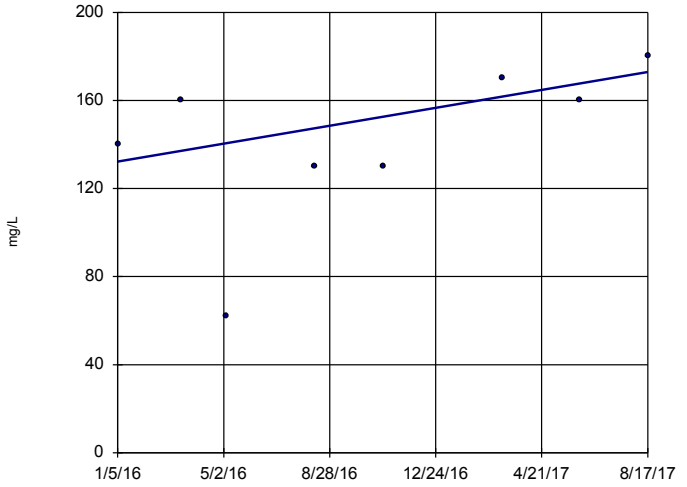
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-6A



n = 8

Slope = 25.16 units per year.

Mann-Kendall statistic = 12
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

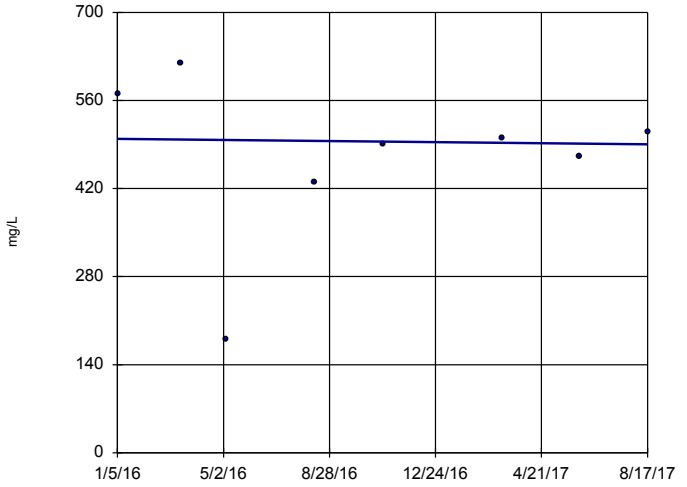
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-7



n = 8

Slope = -5.401 units per year.

Mann-Kendall statistic = 0
critical = 20

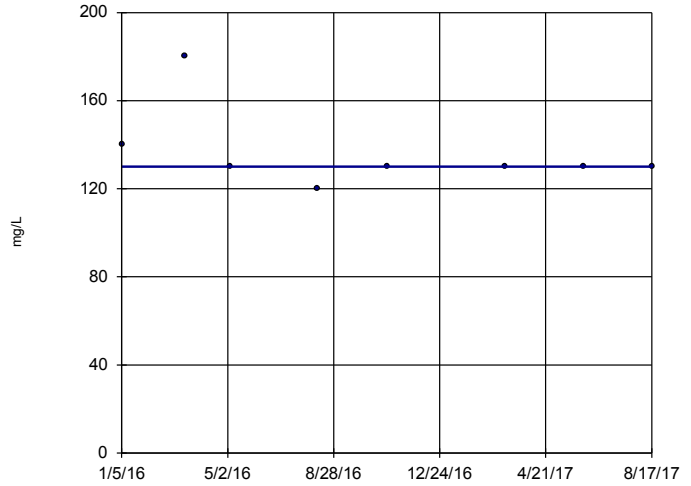
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Chloride

MW-2 (bg)



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

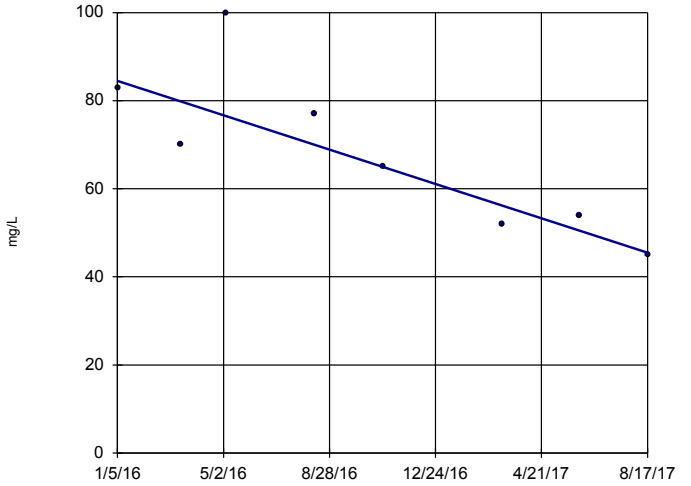
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-3 (bg)



n = 8

Slope = -24.13 units per year.

Mann-Kendall statistic = -20 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

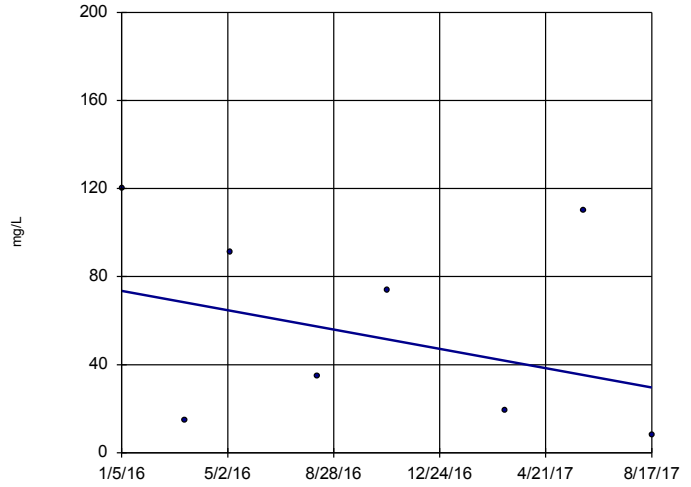
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-4



n = 8

Slope = -27.17 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

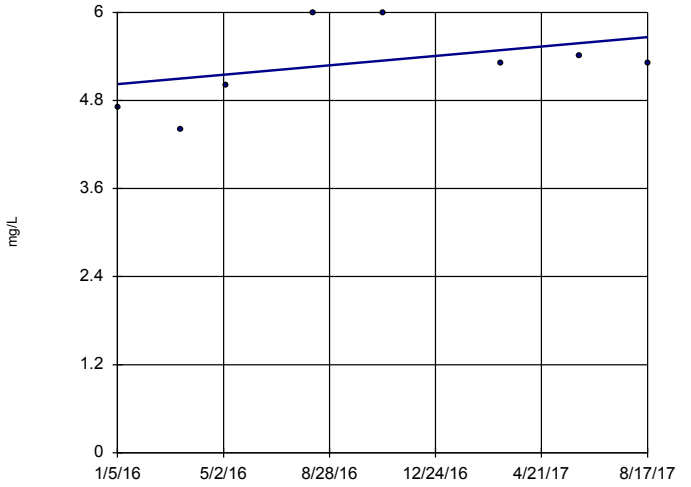
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-5



n = 8

Slope = 0.3955 units per year.

Mann-Kendall statistic = 10 critical = 20

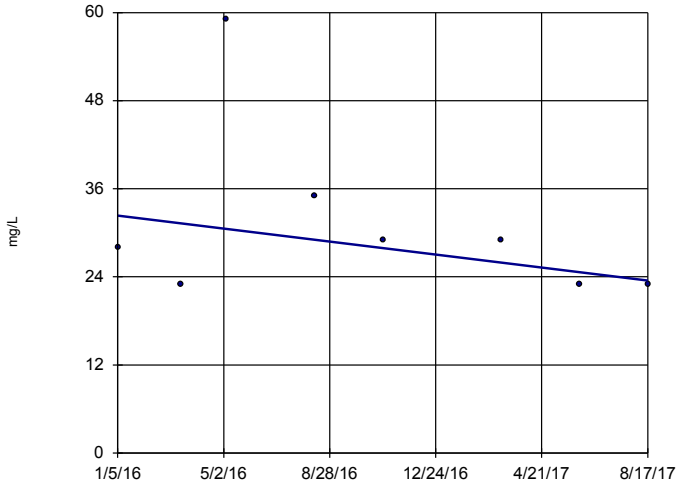
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Chloride

MW-5A



n = 8

Slope = -5.487 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

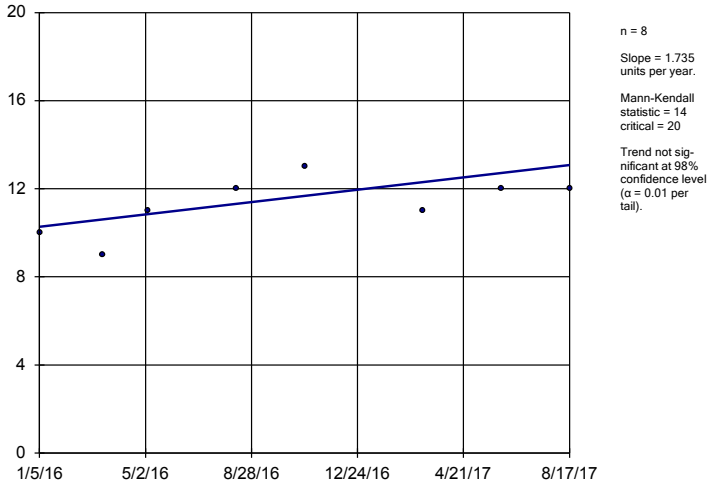
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6



n = 8

Slope = 1.735 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

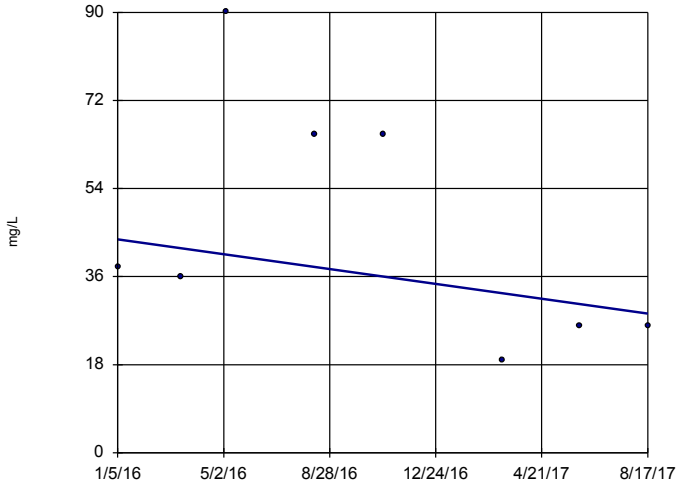
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6A



n = 8

Slope = -9.402 units per year.

Mann-Kendall statistic = -10 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

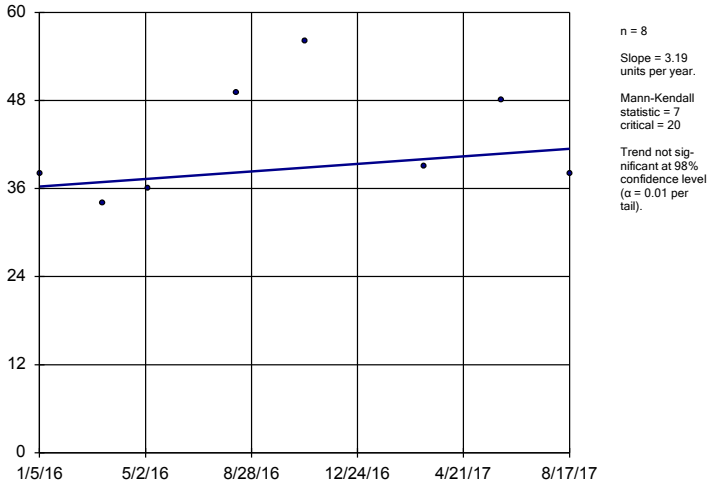
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-7



n = 8

Slope = 3.19 units per year.

Mann-Kendall statistic = 7 critical = 20

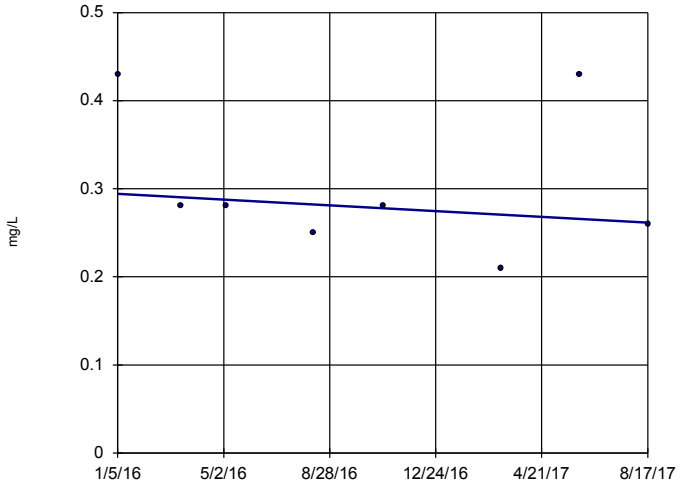
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-2 (bg)



n = 8

Slope = -0.02016 units per year.

Mann-Kendall statistic = -8 critical = -20

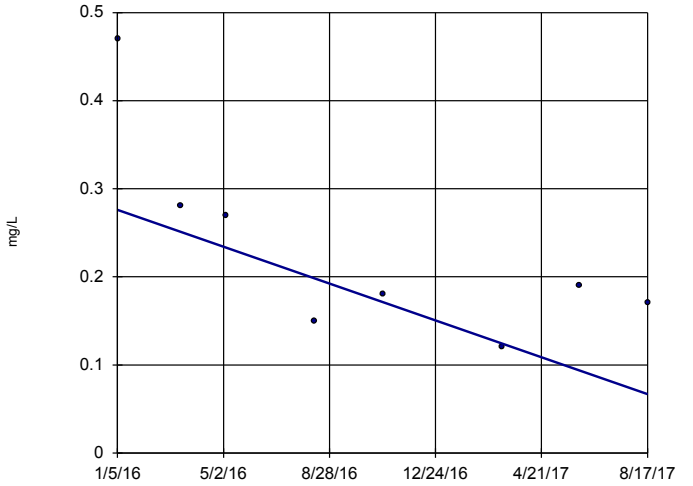
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-3 (bg)



n = 8

Slope = -0.1295 units per year.

Mann-Kendall statistic = -16 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

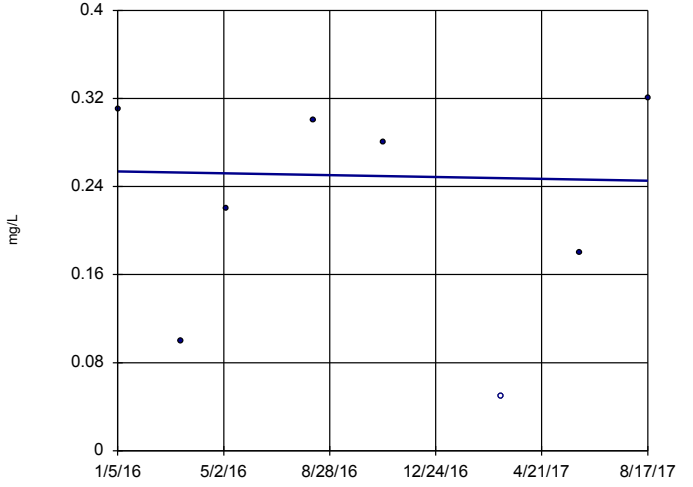
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Fluoride

MW-4



n = 8

Slope = -0.005278 units per year.

Mann-Kendall statistic = 0 critical = 20

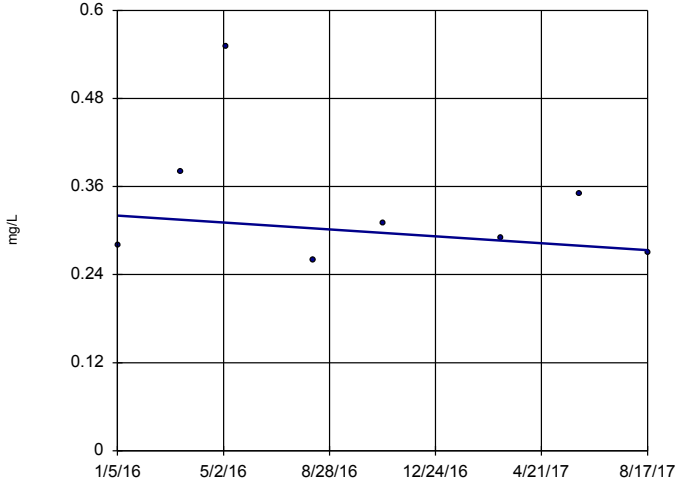
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-5



n = 8

Slope = -0.0291 units per year.

Mann-Kendall statistic = -4 critical = -20

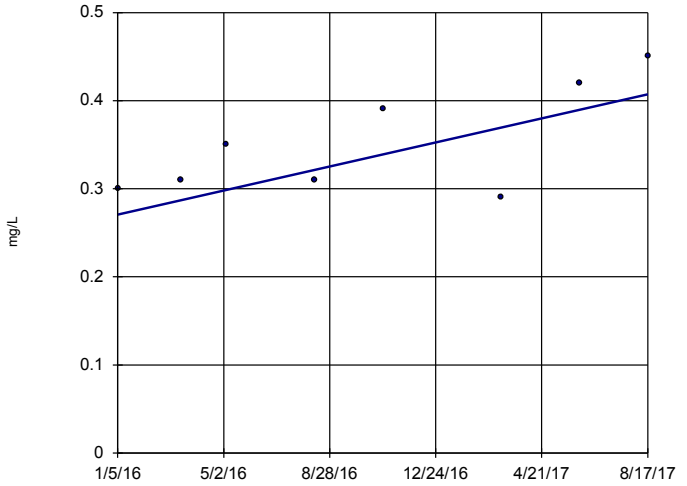
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-5A



n = 8

Slope = 0.08456 units per year.

Mann-Kendall statistic = 15 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

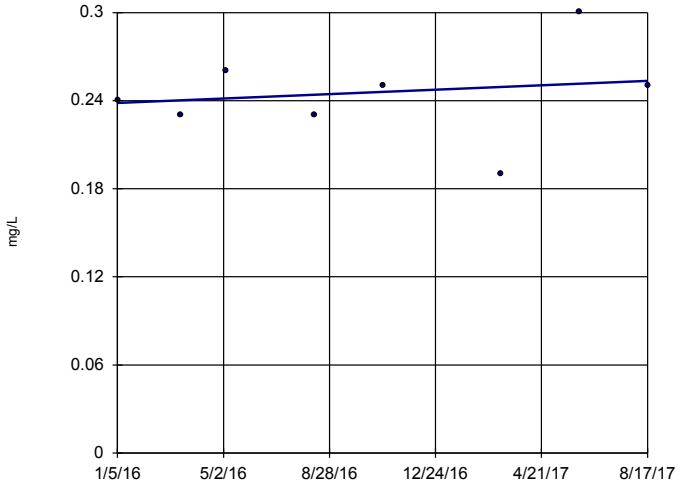
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Fluoride

MW-6



n = 8

Slope = 0.00928 units per year.

Mann-Kendall statistic = 4 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

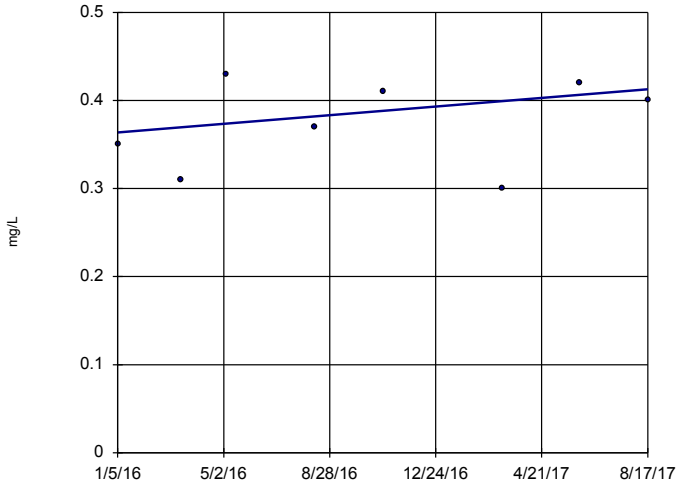
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Fluoride

MW-6A



n = 8

Slope = 0.03022 units per year.

Mann-Kendall statistic = 4 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

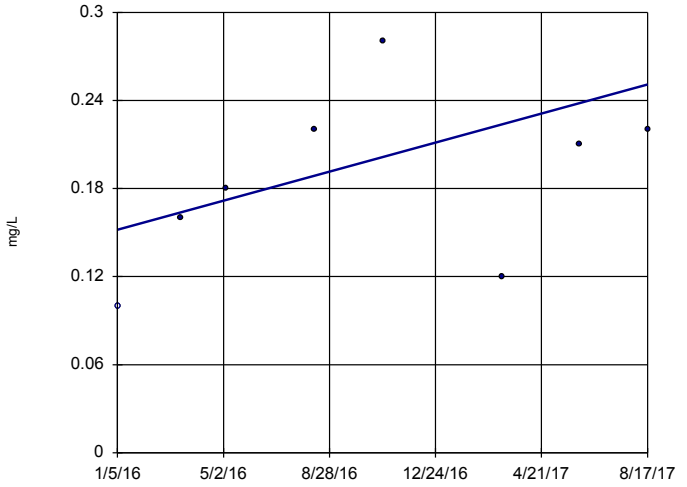
The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Hollow symbols indicate censored values.

Fluoride

MW-7



n = 8

Slope = 0.06113 units per year.

Mann-Kendall statistic = 13 critical = 20

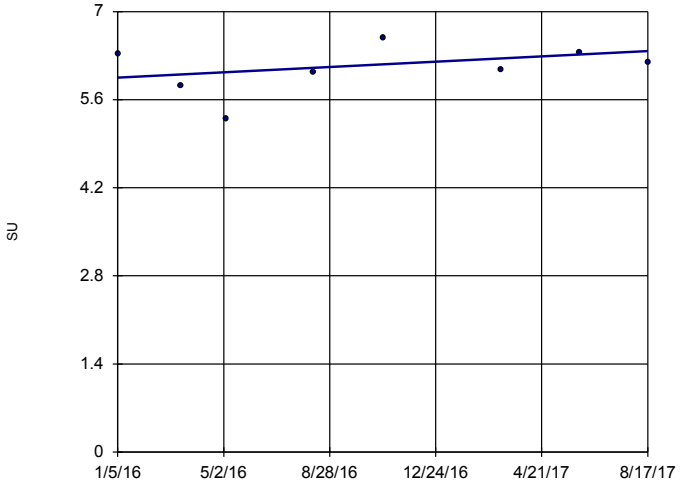
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

pH

MW-2 (bg)



n = 8

Slope = 0.2618 units per year.

Mann-Kendall statistic = 8 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

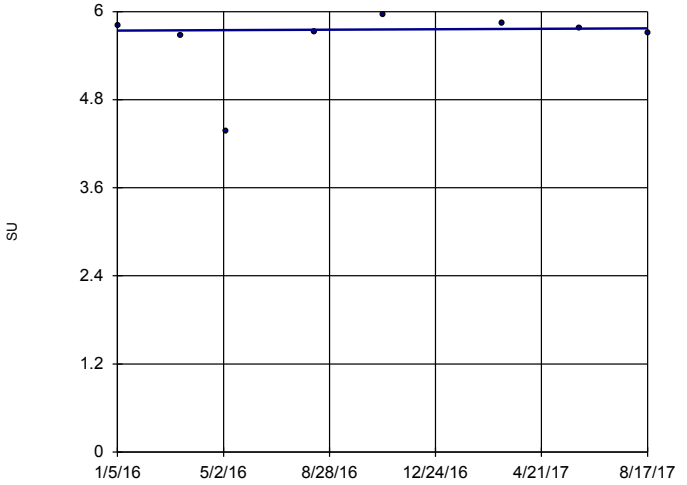
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-3 (bg)



n = 8

Slope = 0.01982 units per year.

Mann-Kendall statistic = 2 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

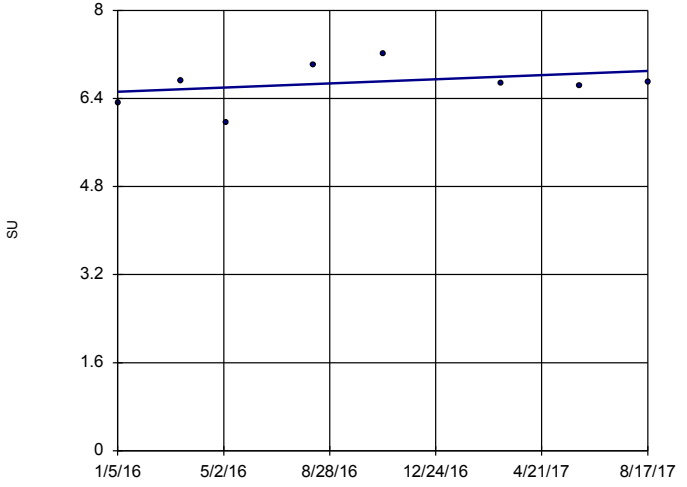
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-4



n = 8

Slope = 0.2307 units per year.

Mann-Kendall statistic = 4 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

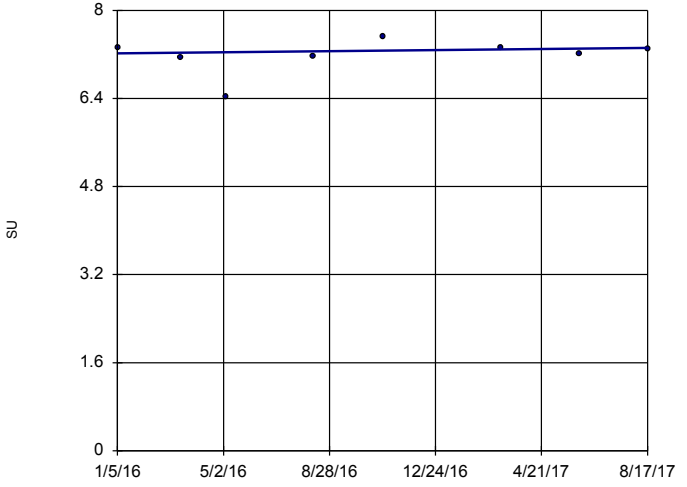
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-5



n = 8

Slope = 0.05967 units per year.

Mann-Kendall statistic = 4 critical = 20

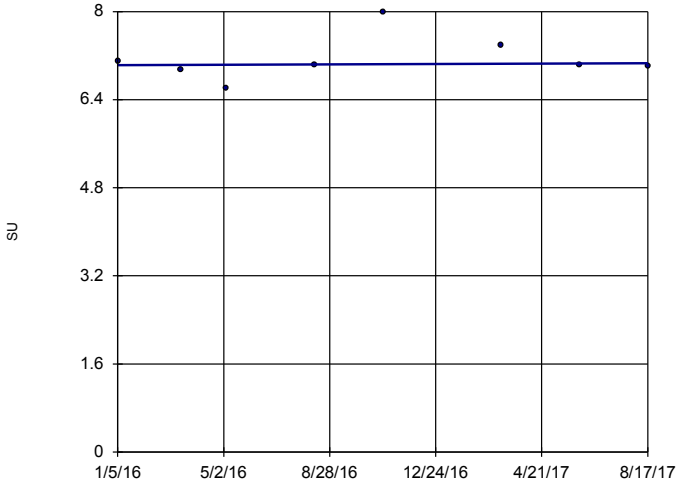
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

pH

MW-5A



n = 8

Slope = 0.0211 units per year.

Mann-Kendall statistic = 1 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

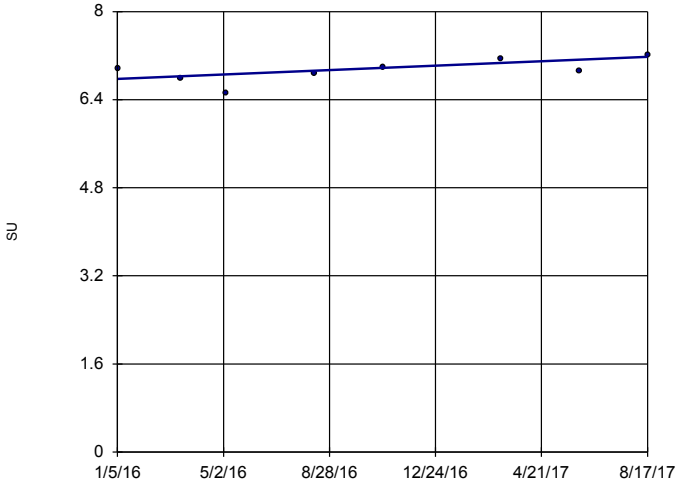
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-6



n = 8

Slope = 0.2471 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

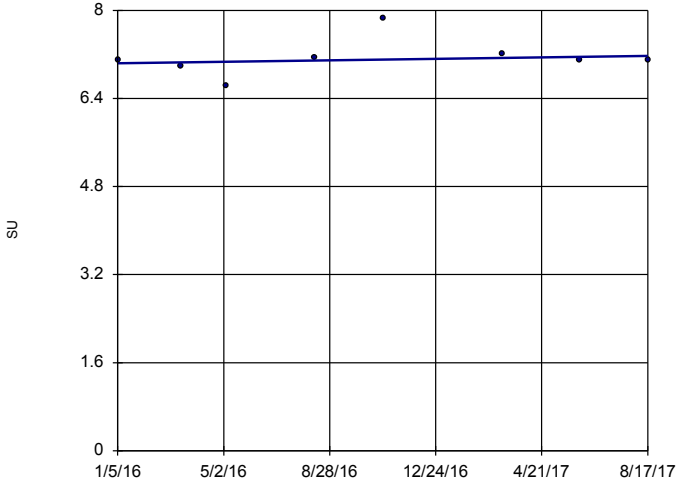
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-6A



n = 8

Slope = 0.08386 units per year.

Mann-Kendall statistic = 7 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

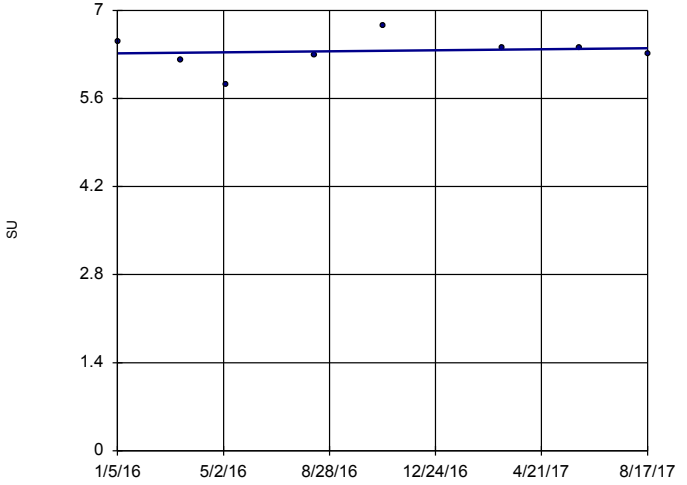
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-7



n = 8

Slope = 0.04935 units per year.

Mann-Kendall statistic = 4 critical = 20

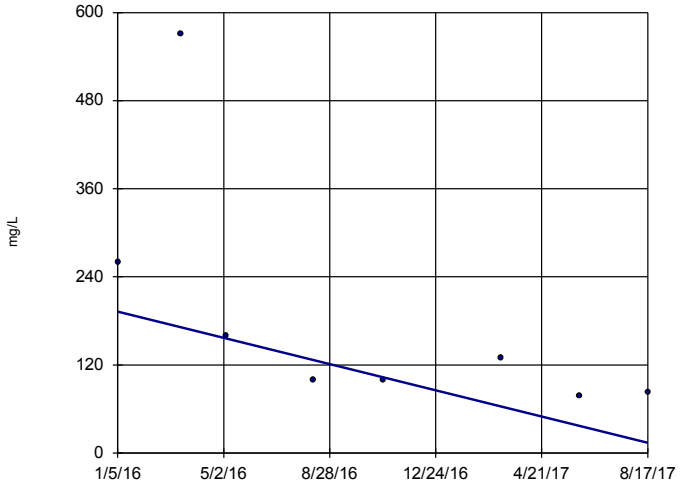
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sulfate

MW-2 (bg)



n = 8

Slope = -110.6 units per year.

Mann-Kendall statistic = -20 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

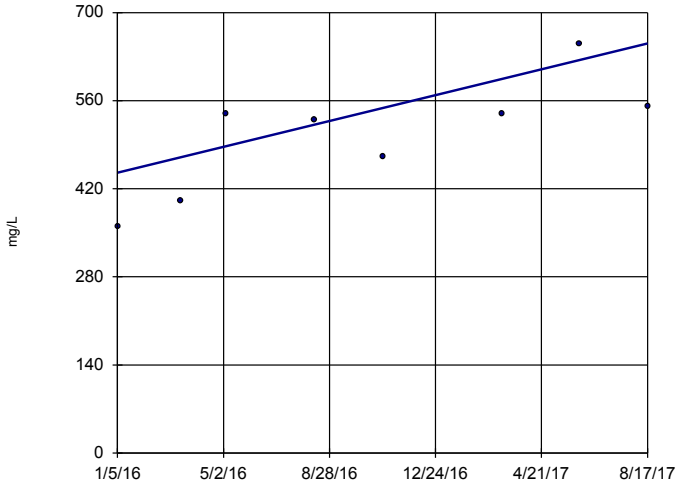
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-3 (bg)



n = 8

Slope = 126.8 units per year.

Mann-Kendall statistic = 19 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

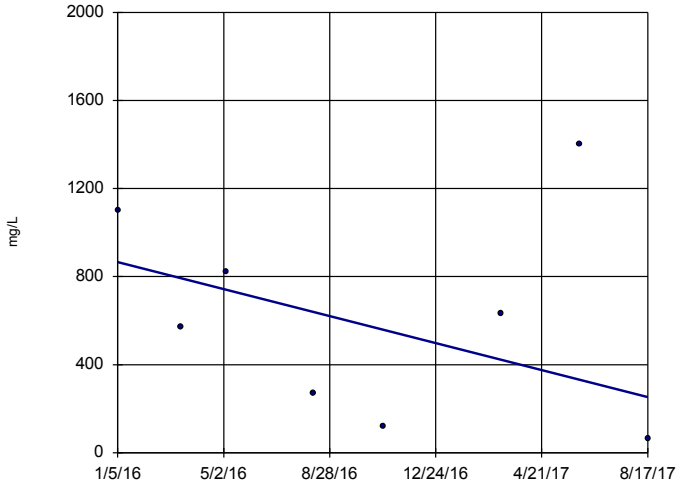
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-4



n = 8

Slope = -379.2 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

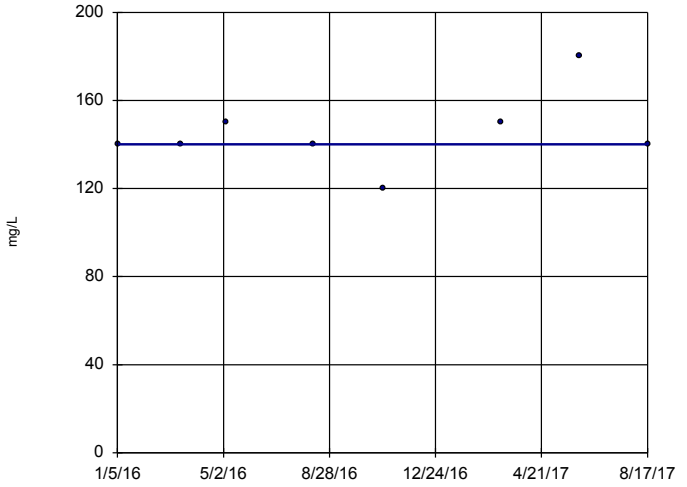
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-5



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 5 critical = 20

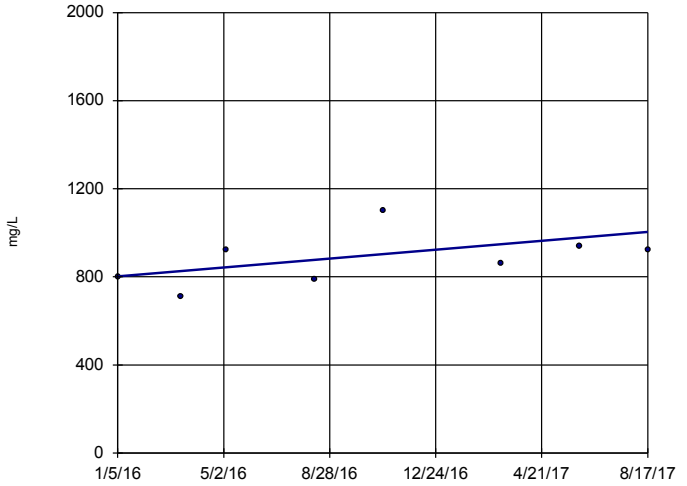
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sulfate

MW-5A



n = 8

Slope = 125.4 units per year.

Mann-Kendall statistic = 11 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

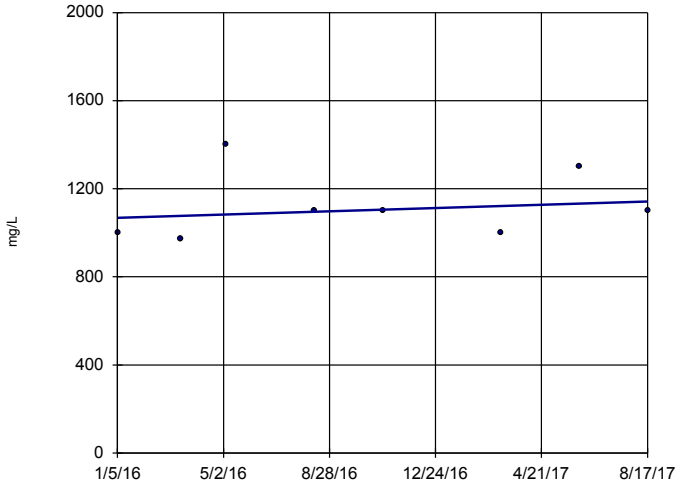
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6



n = 8

Slope = 46.31 units per year.

Mann-Kendall statistic = 6 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

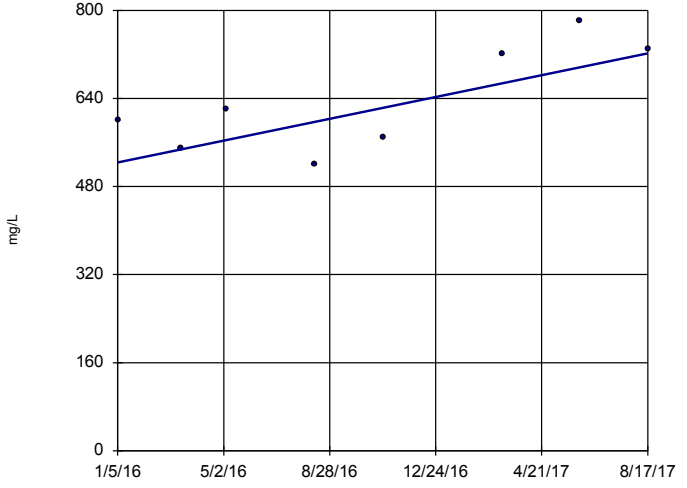
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6A



n = 8

Slope = 122.7 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

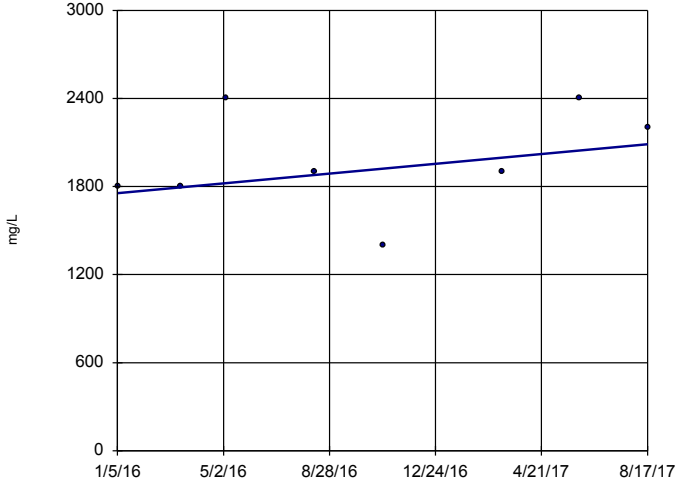
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-7



n = 8

Slope = 206.6 units per year.

Mann-Kendall statistic = 9 critical = 20

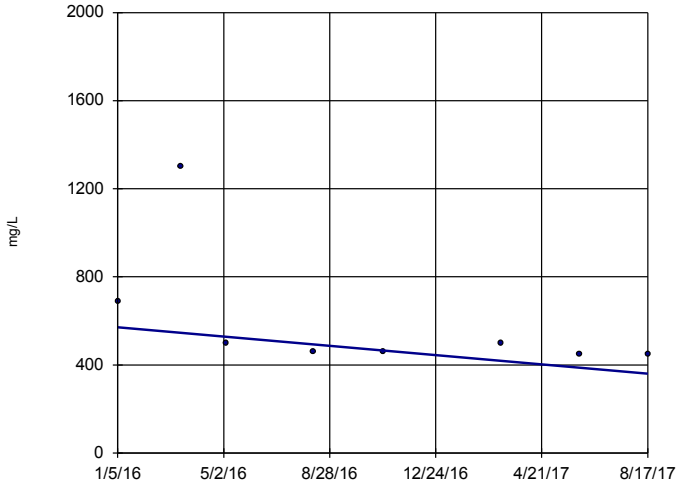
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-2 (bg)



n = 8

Slope = -130.2 units per year.

Mann-Kendall statistic = -19 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

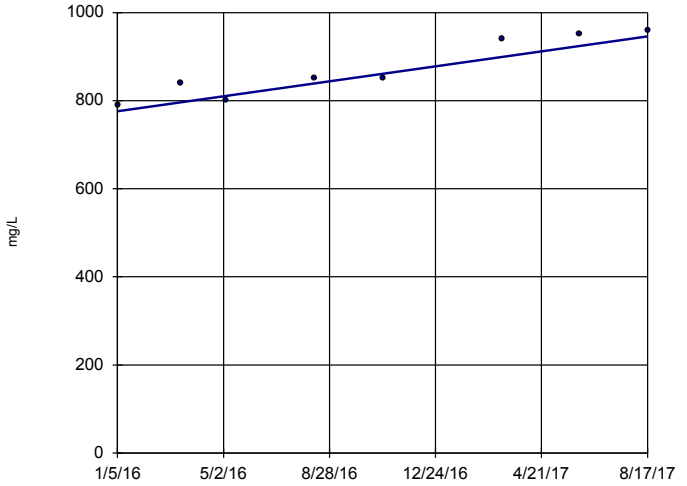
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-3 (bg)



n = 8

Slope = 105 units per year.

Mann-Kendall statistic = 25 critical = 20

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

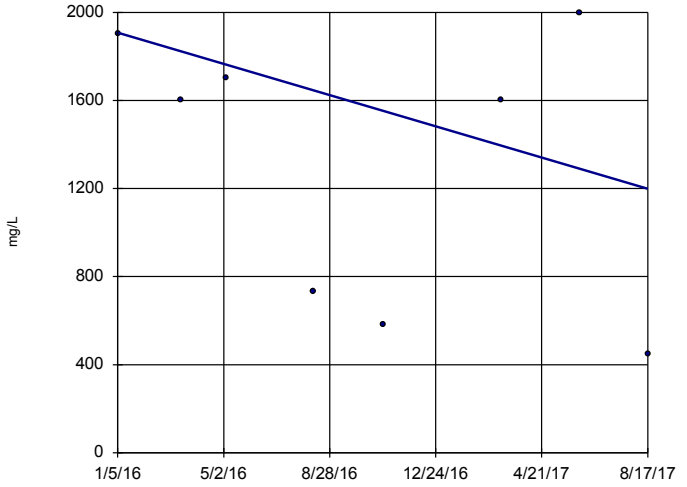
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-4



n = 8

Slope = -439 units per year.

Mann-Kendall statistic = -9 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

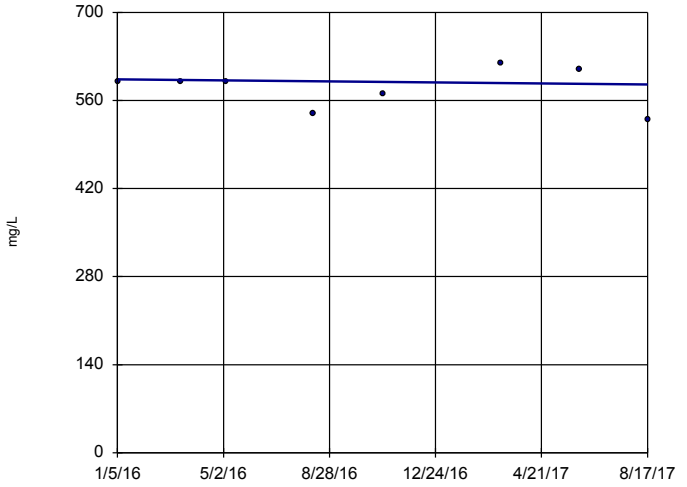
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-5



n = 8

Slope = -4.906 units per year.

Mann-Kendall statistic = -3 critical = -20

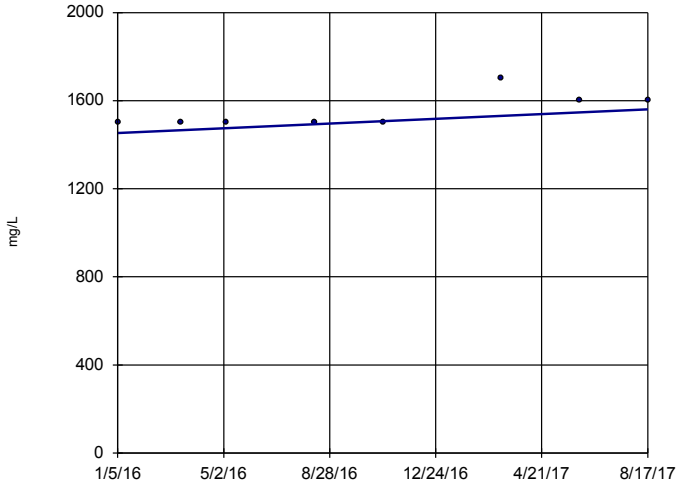
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-5A



n = 8

Slope = 66.1 units per year.

Mann-Kendall statistic = 13 critical = 20

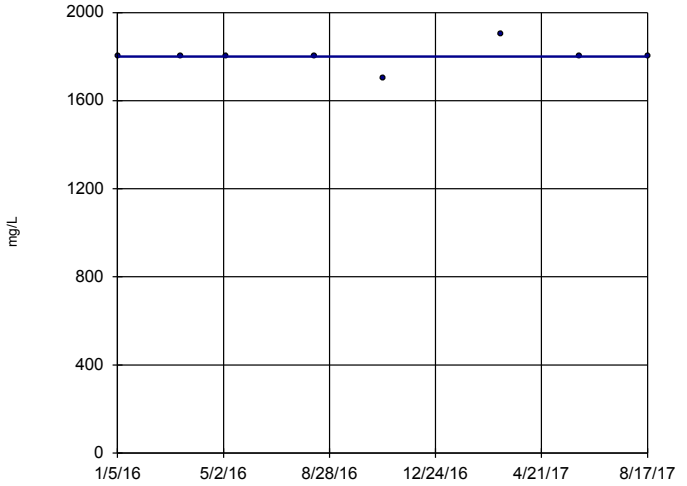
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-6



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 1 critical = 20

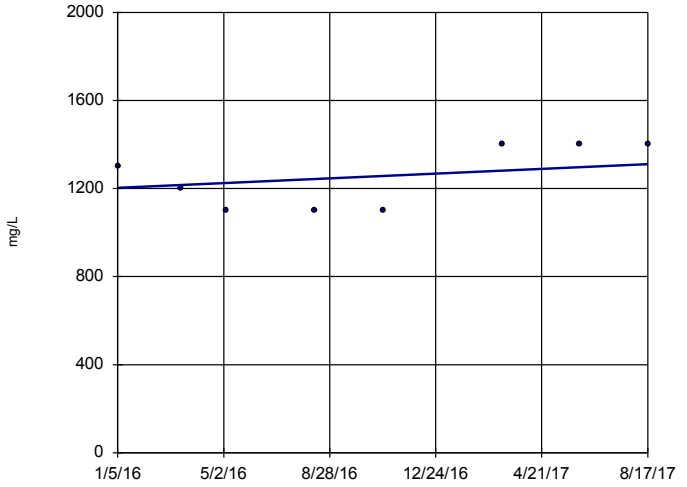
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-6A



n = 8

Slope = 66.44 units per year.

Mann-Kendall statistic = 8 critical = 20

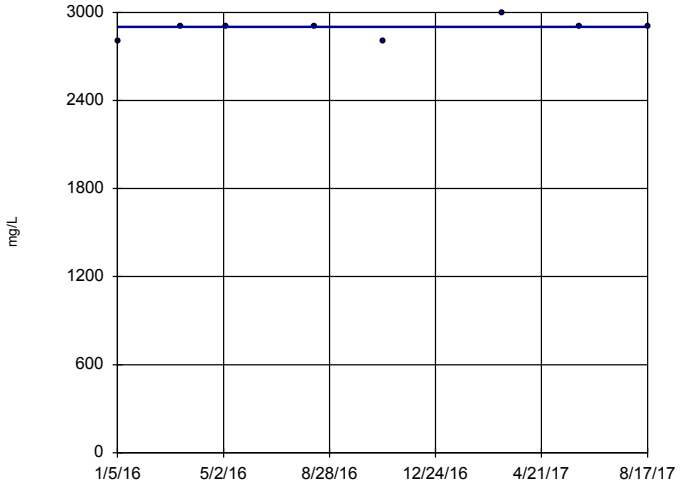
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-7



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 7 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Trend Test

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3 only Printed 1/23/2018, 3:10 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-2 (bg)	-0.08868	-16	-20	No	8	0	n/a	n/a	0.02	NP
Boron (mg/L)	**MW-3 (bg)**	**-0.01797**	**-21**	**-20**	**Yes**	**8**	**50**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	MW-4	0	-1	-20	No	8	62.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5	0	0	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5A	0.03993	18	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6	0.06117	14	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6A	0.08497	19	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-7	0	2	20	No	8	12.5	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2 (bg)	-0.8333	-2	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3 (bg)	15.6	18	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4	-36.95	-6	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5	-4.395	-3	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5A	16.74	10	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6	7.67	8	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6A	25.16	12	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-7	-5.401	0	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2 (bg)	0	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3 (bg)	-24.13	-20	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4	-27.17	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5	0.3955	10	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5A	-5.487	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6	1.735	14	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6A	-9.402	-10	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-7	3.19	7	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2 (bg)	-0.02016	-8	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3 (bg)	-0.1295	-16	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4	-0.00...	0	20	No	8	12.5	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5	-0.0291	-4	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5A	0.08456	15	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6	0.00928	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6A	0.03022	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-7	0.06113	13	20	No	8	12.5	n/a	n/a	0.02	NP
pH (SU)	MW-2 (bg)	0.2618	8	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-3 (bg)	0.01982	2	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-4	0.2307	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-5	0.05967	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-5A	0.0211	1	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-6	0.2471	14	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-6A	0.08386	7	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-7	0.04935	4	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2 (bg)	-110.6	-20	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3 (bg)	126.8	19	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4	-379.2	-8	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5	0	5	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5A	125.4	11	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6	46.31	6	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6A	122.7	14	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-7	206.6	9	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-2 (bg)	-130.2	-19	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	**MW-3 (bg)**	**105**	**25**	**20**	**Yes**	**8**	**0**	**n/a**	**n/a**	**0.02**	**NP**

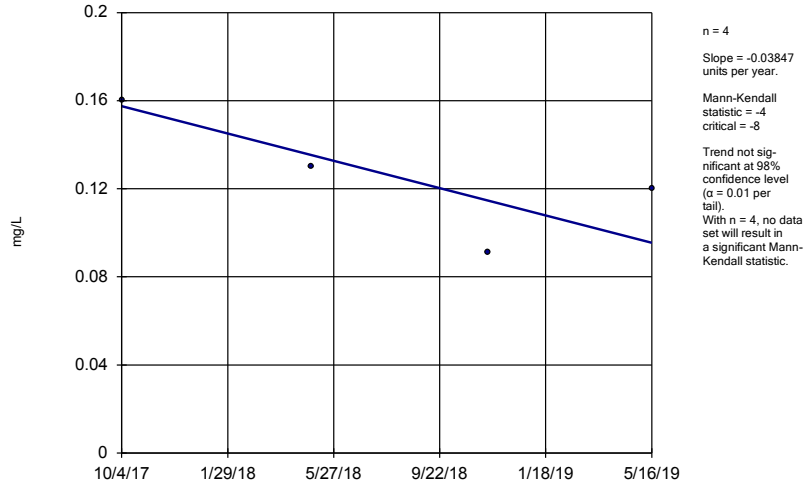
Trend Test

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3 only Printed 1/23/2018, 3:10 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Total Dissolved Solids (mg/L)	MW-4	-439	-9	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5	-4.906	-3	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5A	66.1	13	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6	0	1	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6A	66.44	8	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-7	0	7	20	No	8	0	n/a	n/a	0.02	NP

Boron

MW-2 (bg)



n = 4

Slope = -0.03847 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

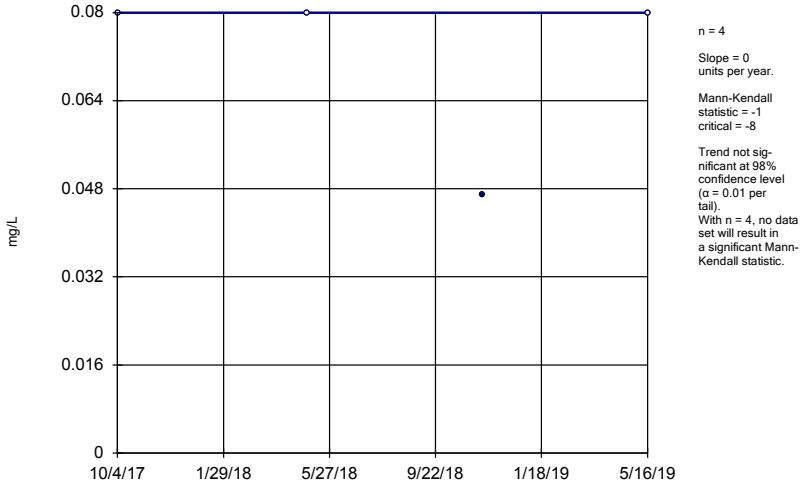
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Boron

MW-3 (bg)



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = -1
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Boron

MW-4

n = 4

Slope = 0 units per year.

Mann-Kendall statistic = -1
critical = -8

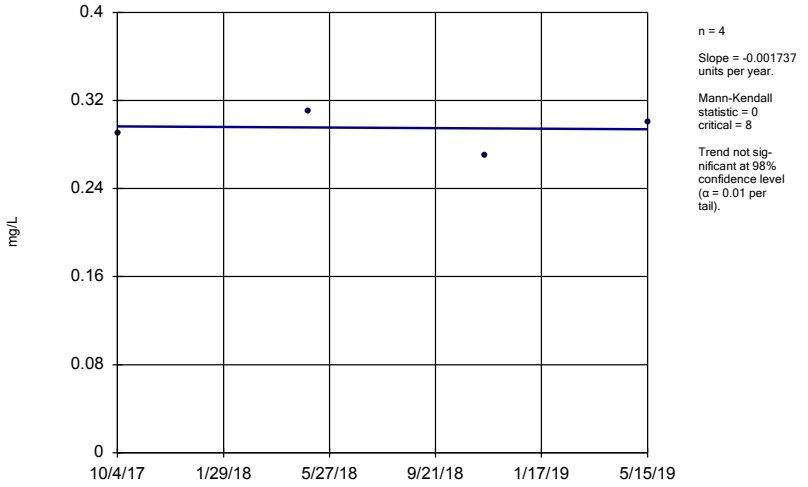
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Boron

MW-5



n = 4

Slope = -0.001737 units per year.

Mann-Kendall statistic = 0
critical = 8

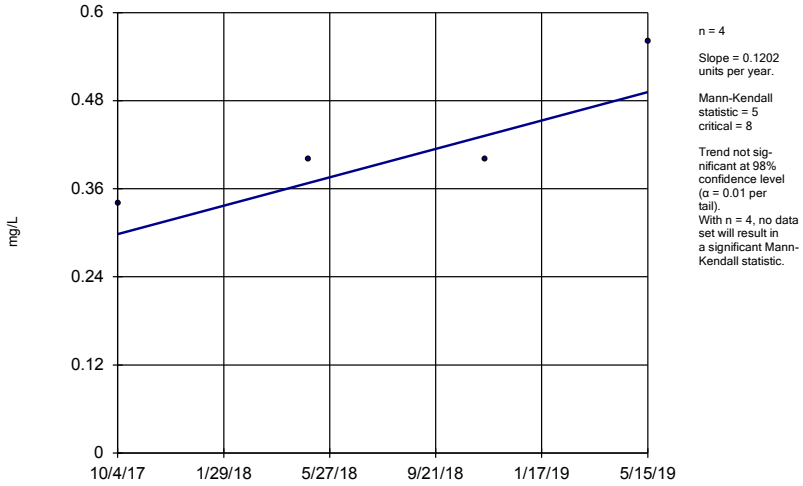
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Boron

MW-5A



n = 4

Slope = 0.1202 units per year.

Mann-Kendall statistic = 5
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

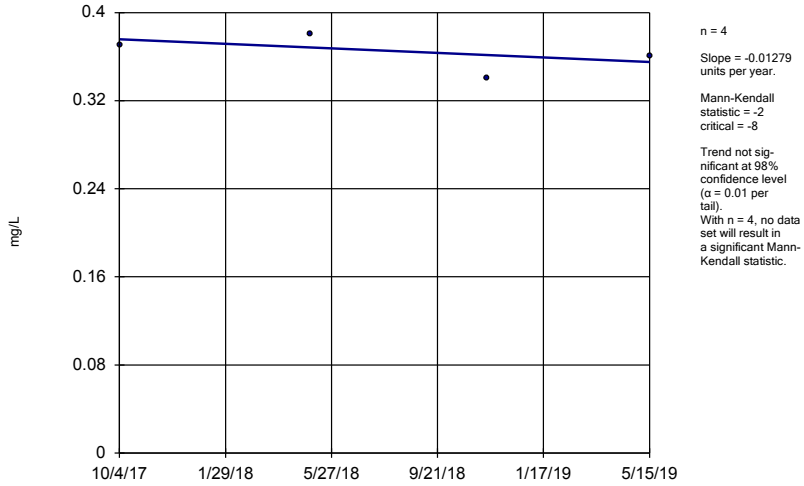
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Boron

MW-6



n = 4

Slope = -0.01279 units per year.

Mann-Kendall statistic = -2
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

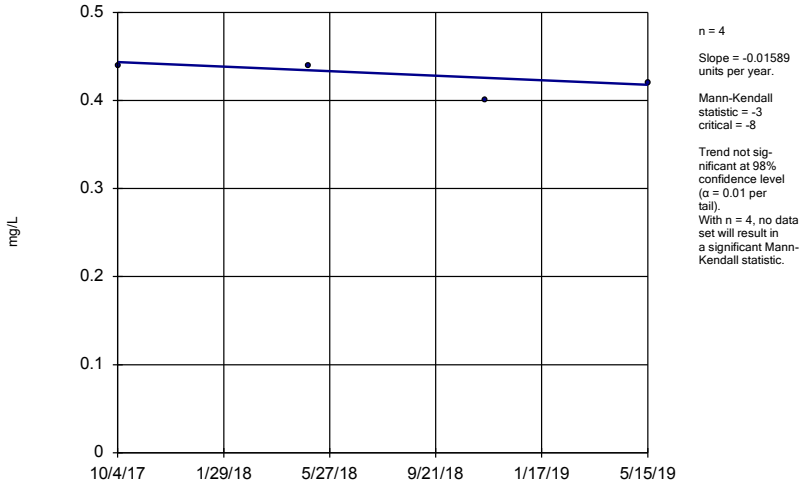
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Boron

MW-6A



n = 4

Slope = -0.01589 units per year.

Mann-Kendall statistic = -3
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

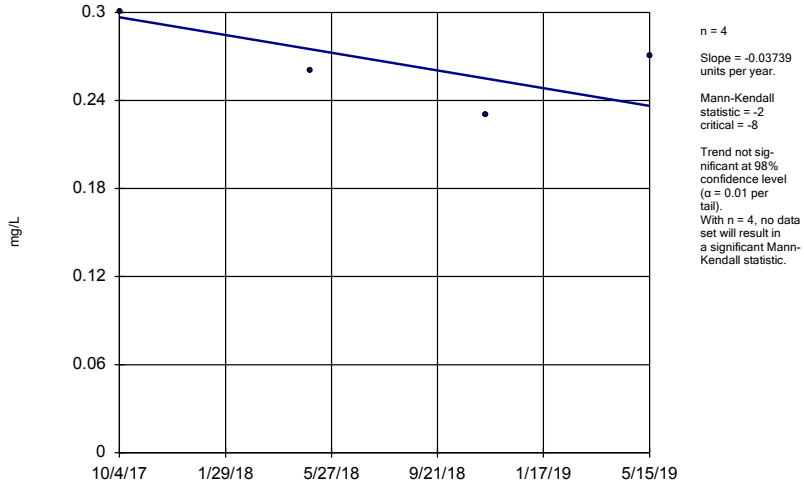
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Boron

MW-7 (bg)



n = 4

Slope = -0.03739 units per year.

Mann-Kendall statistic = -2
critical = -8

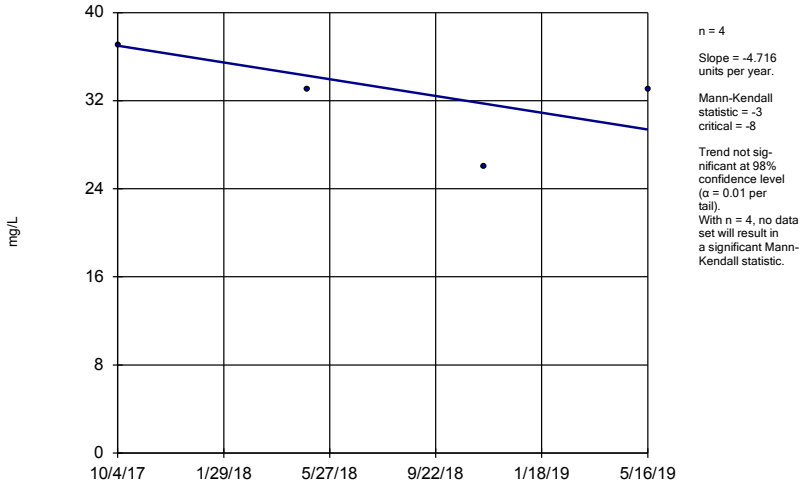
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Calcium

MW-2 (bg)



n = 4

Slope = -4.716 units per year.

Mann-Kendall statistic = -3
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

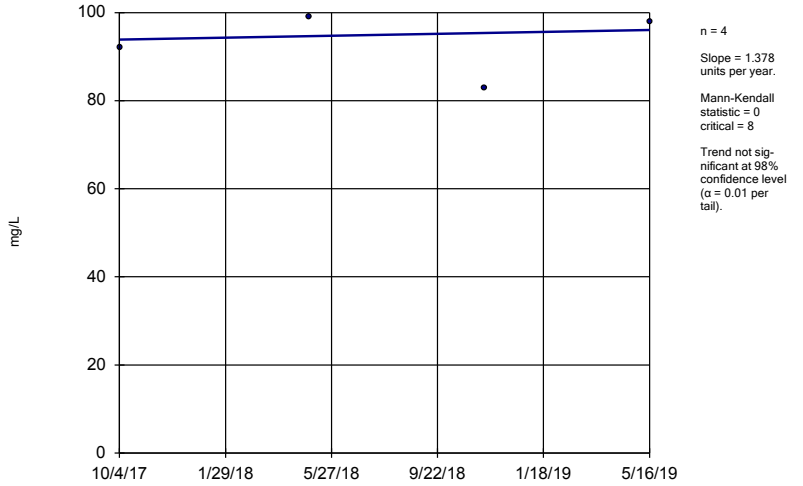
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-3 (bg)



n = 4

Slope = 1.378 units per year.

Mann-Kendall statistic = 0
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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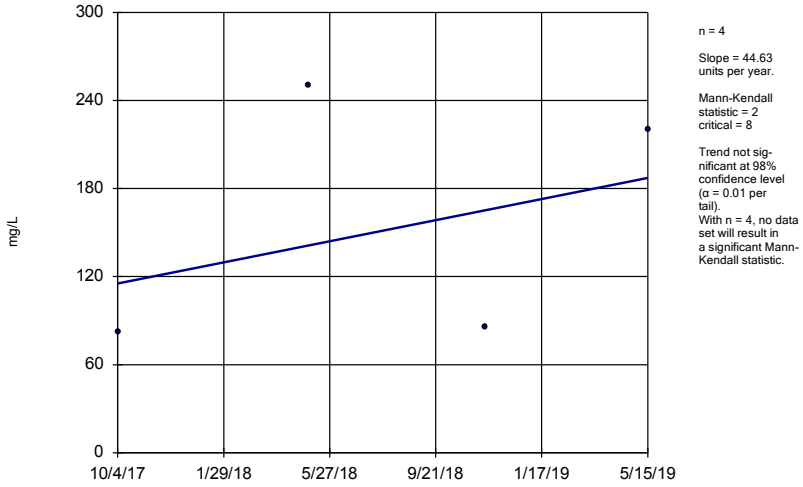
Calcium

MW-4



n = 4

Slope = 44.63 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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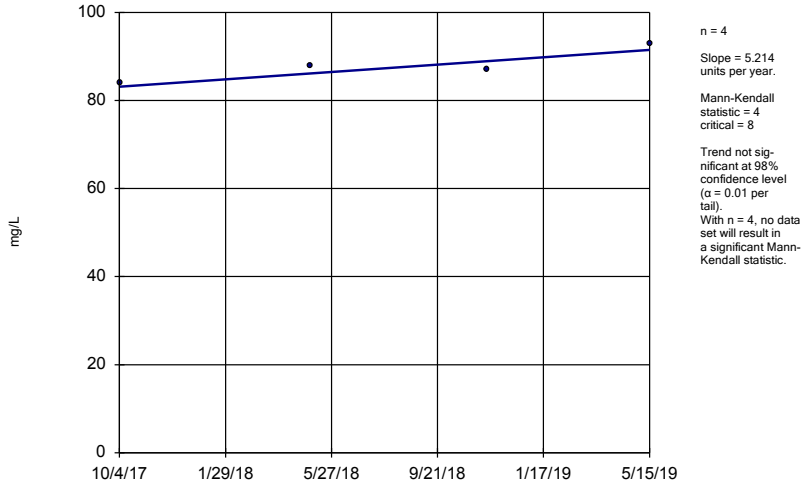
Calcium

MW-5



n = 4

Slope = 5.214 units per year.

Mann-Kendall statistic = 4
critical = 8

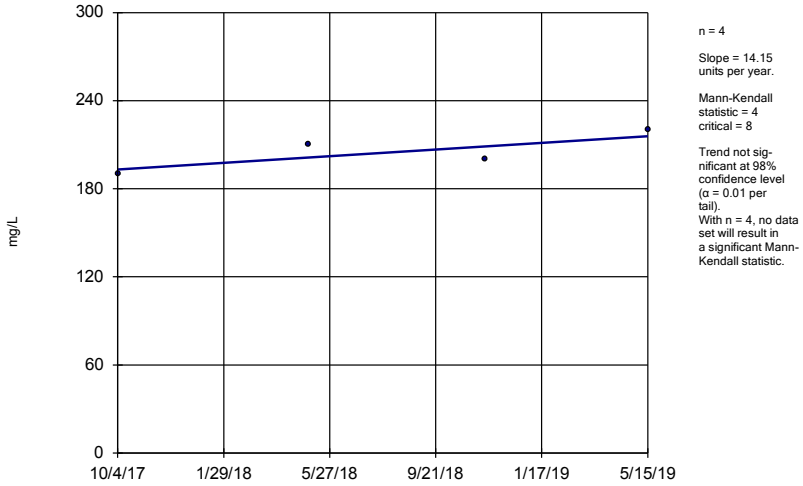
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Calcium

MW-5A



n = 4

Slope = 14.15 units per year.

Mann-Kendall statistic = 4
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

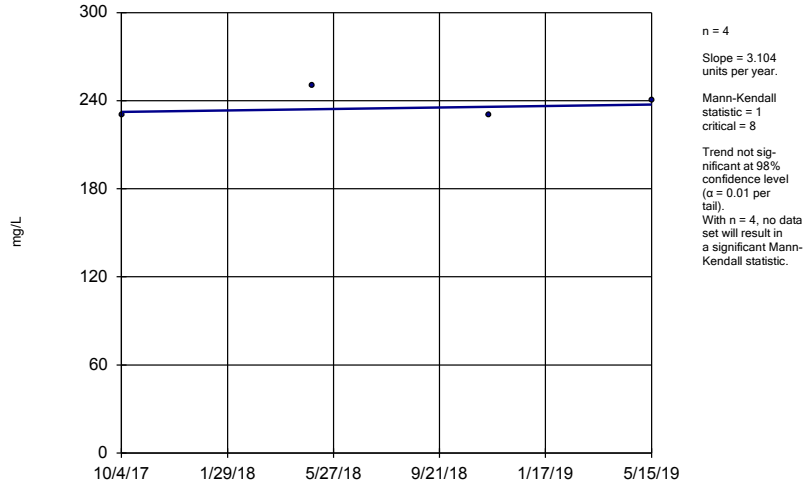
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-6



n = 4

Slope = 3.104 units per year.

Mann-Kendall statistic = 1
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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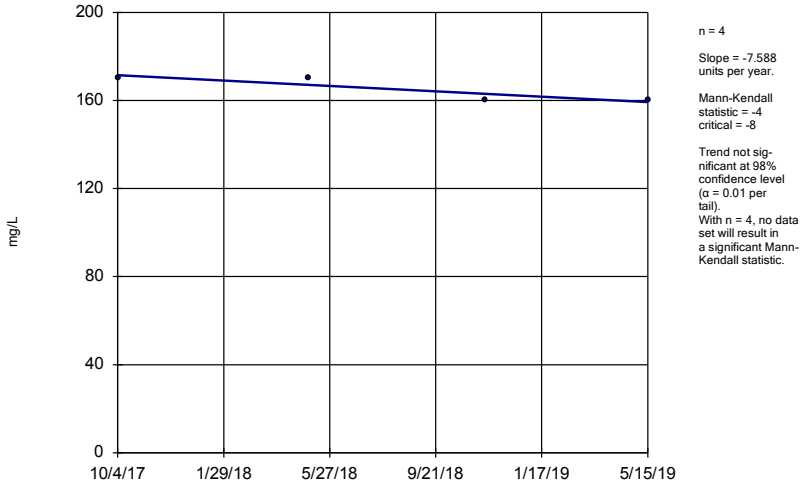
Calcium

MW-6A



n = 4

Slope = -7.588 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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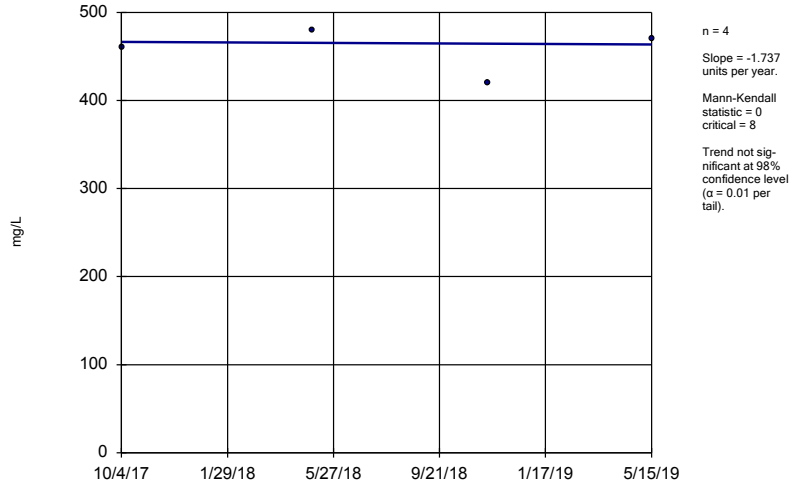
Calcium

MW-7 (bg)



n = 4

Slope = -1.737 units per year.

Mann-Kendall statistic = 0
critical = 8

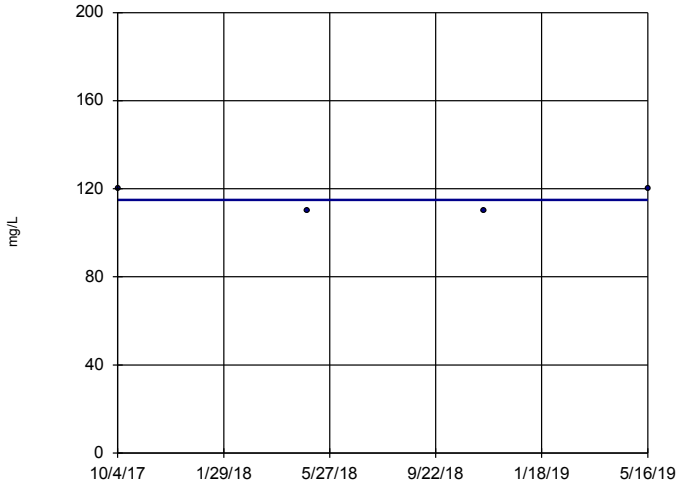
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Chloride

MW-2 (bg)



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).

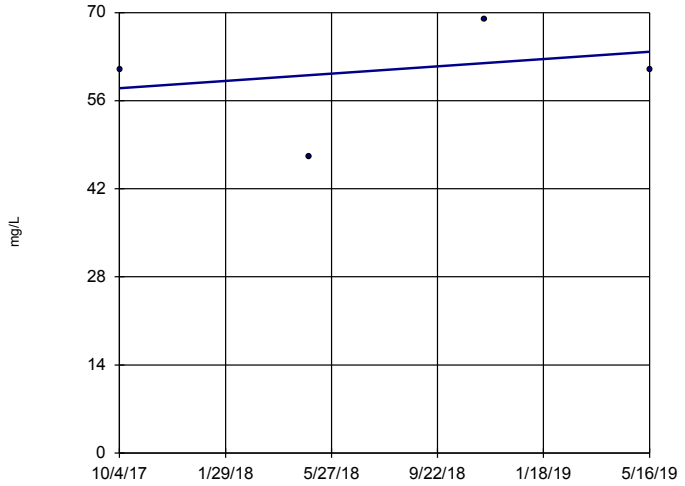
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-3 (bg)



n = 4

Slope = 3.596 units per year.

Mann-Kendall statistic = 1 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

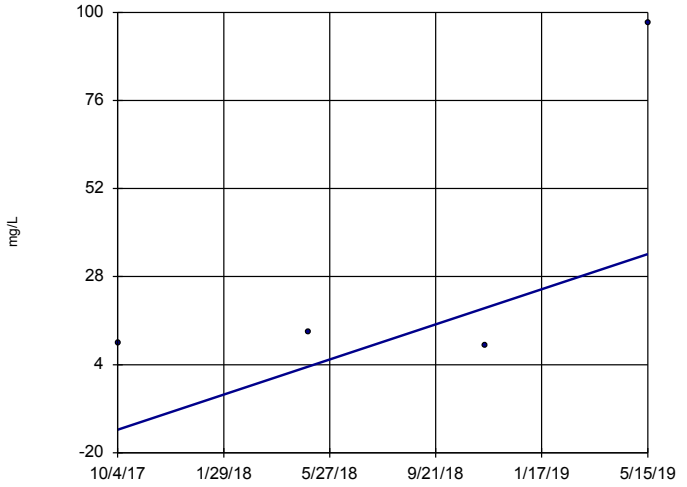
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-4



n = 4

Slope = 29.71 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

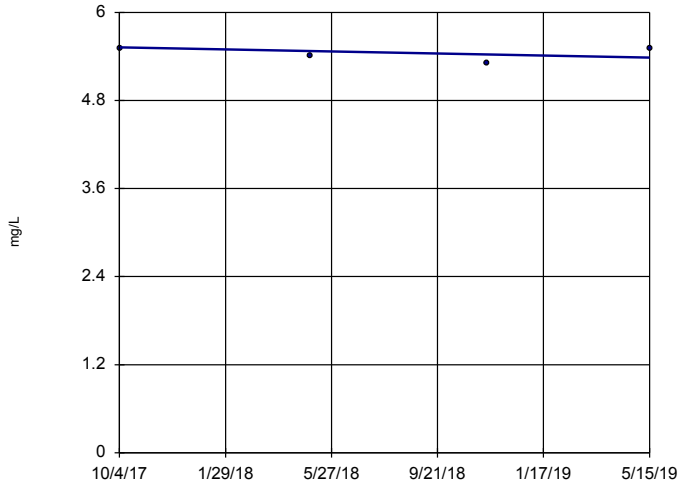
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-5



n = 4

Slope = -0.08649 units per year.

Mann-Kendall statistic = -1 critical = -8

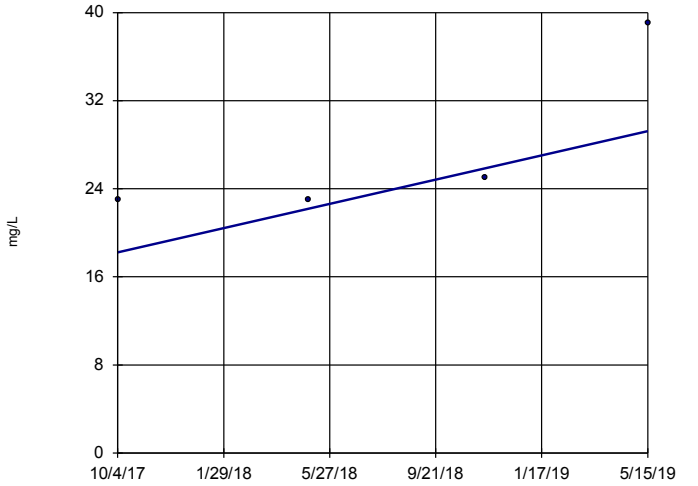
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Chloride

MW-5A



n = 4

Slope = 6.828 units per year.

Mann-Kendall statistic = 5 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

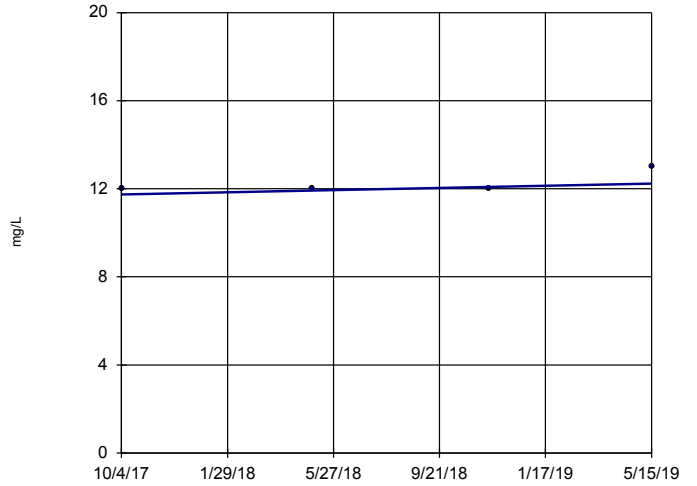
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6



n = 4

Slope = 0.3104 units per year.

Mann-Kendall statistic = 3 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

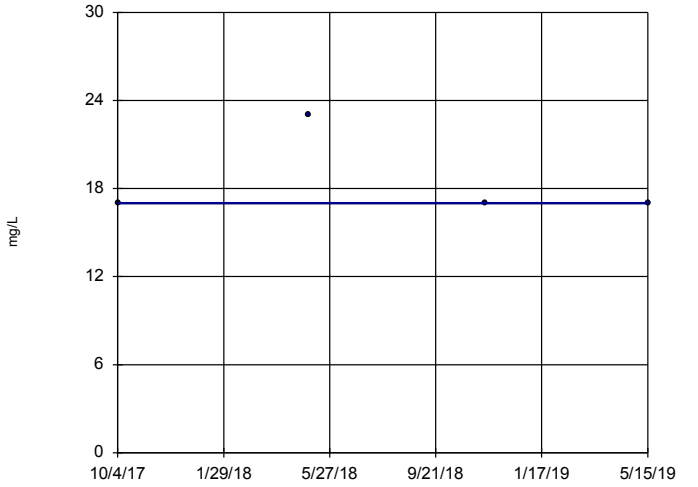
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6A



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = -1 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

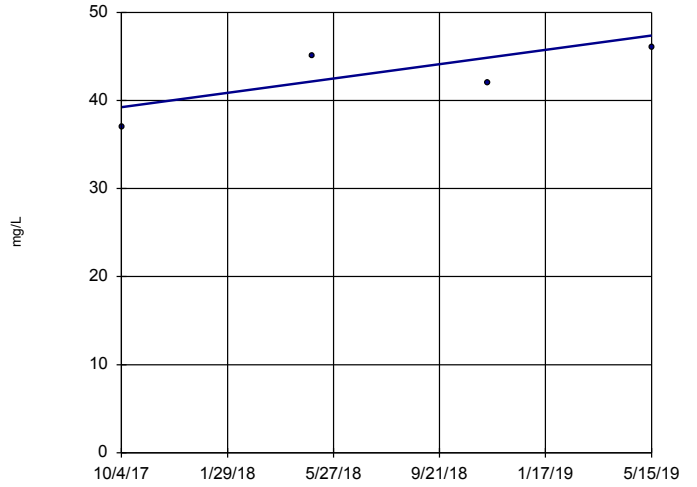
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-7 (bg)



n = 4

Slope = 5.041 units per year.

Mann-Kendall statistic = 4 critical = 8

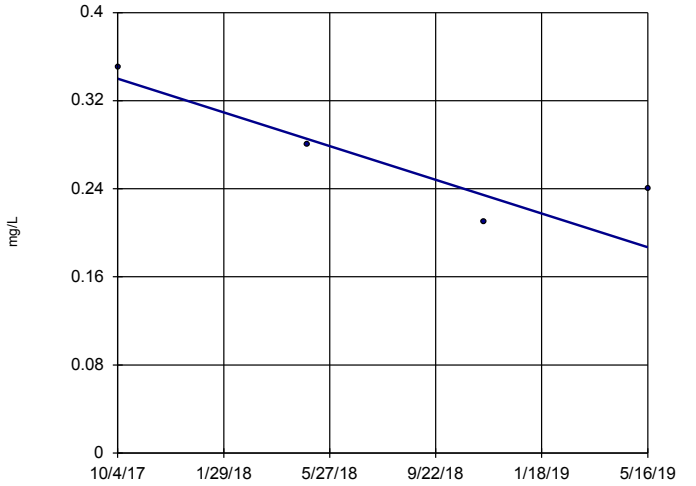
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Fluoride

MW-2 (bg)



n = 4

Slope = -0.09492 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

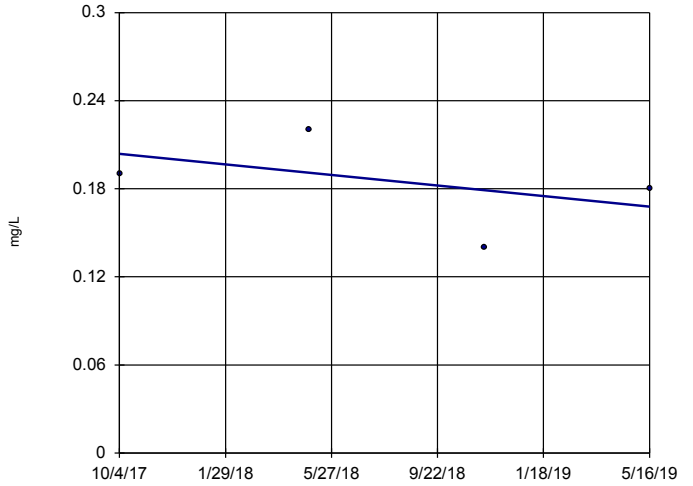
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Fluoride

MW-3 (bg)



n = 4

Slope = -0.02236 units per year.

Mann-Kendall statistic = -2
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

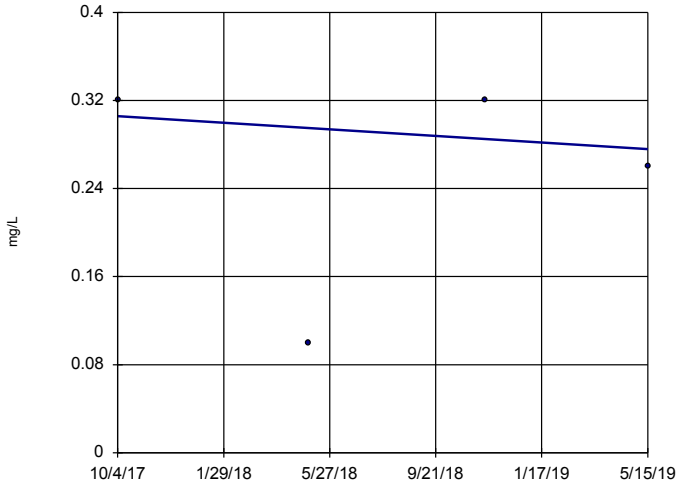
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Fluoride

MW-4



n = 4

Slope = -0.01862 units per year.

Mann-Kendall statistic = -1
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

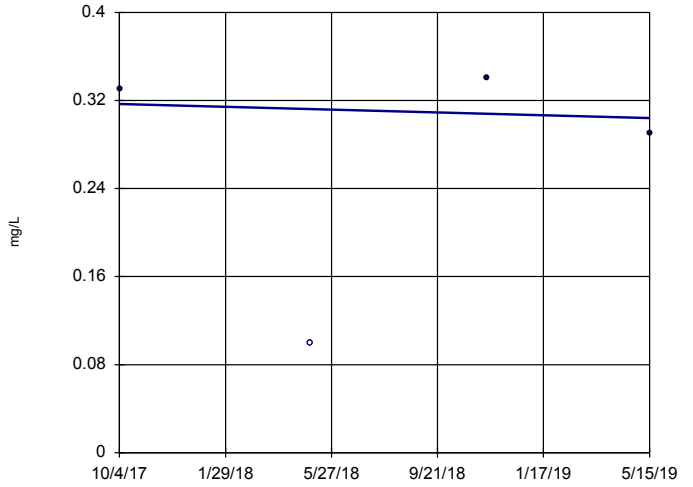
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Fluoride

MW-5



n = 4

Slope = -0.007931 units per year.

Mann-Kendall statistic = 0
critical = 8

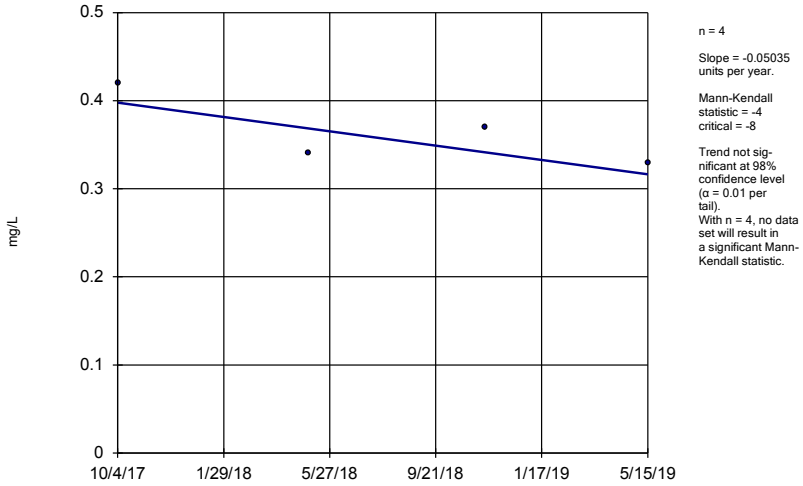
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Fluoride

MW-5A



n = 4

Slope = -0.05035 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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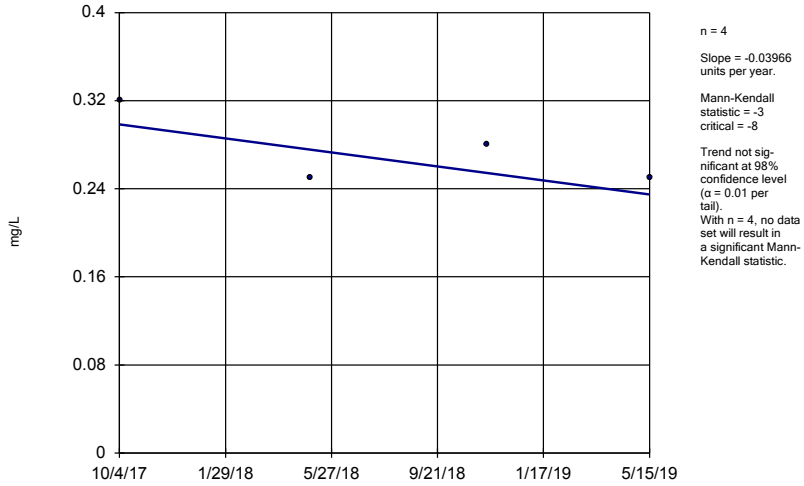
Fluoride

MW-6



n = 4

Slope = -0.03966 units per year.

Mann-Kendall statistic = -3
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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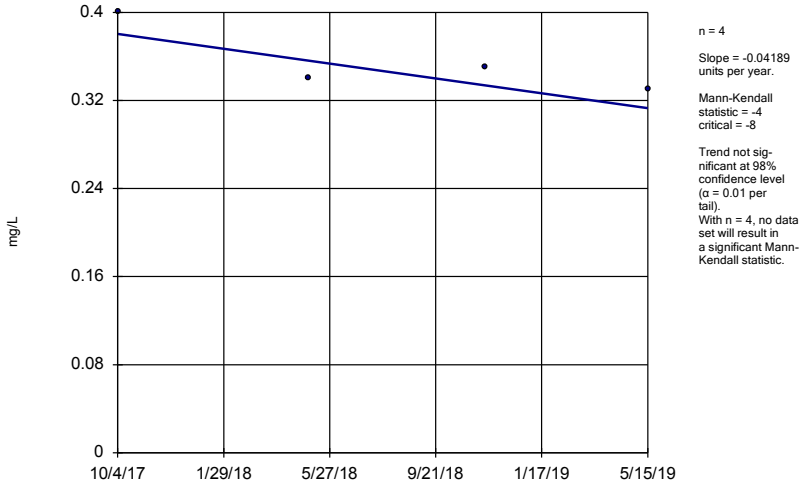
Fluoride

MW-6A



n = 4

Slope = -0.04189 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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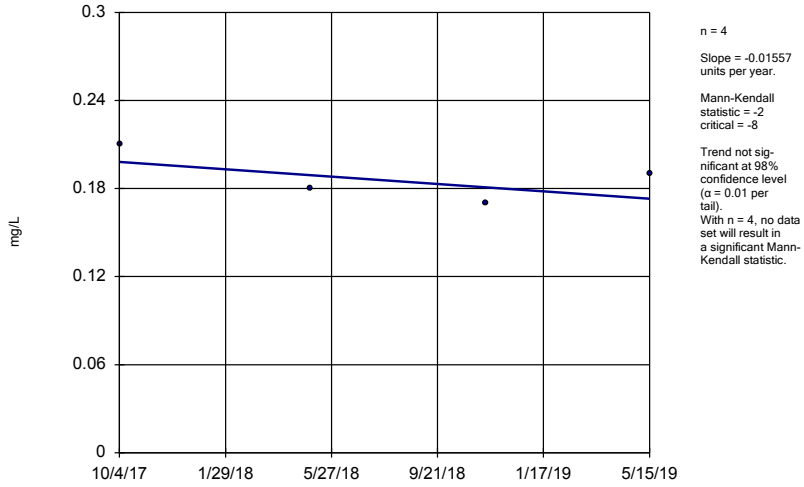
Fluoride

MW-7 (bg)



n = 4

Slope = -0.01557 units per year.

Mann-Kendall statistic = -2
critical = -8

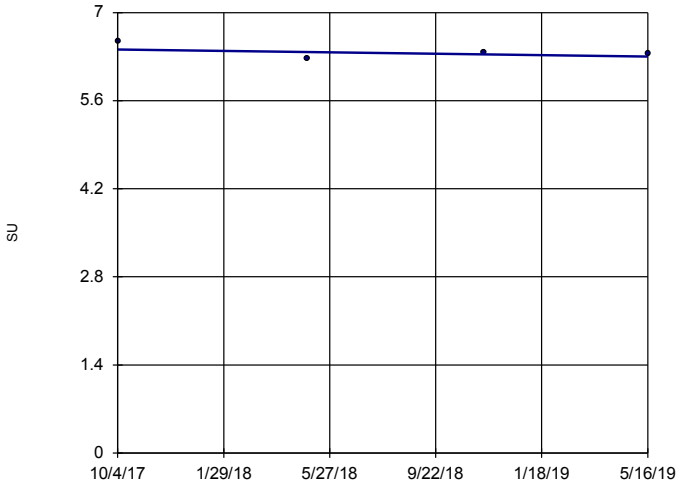
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

pH

MW-2 (bg)



n = 4

Slope = -0.0689 units per year.

Mann-Kendall statistic = -2 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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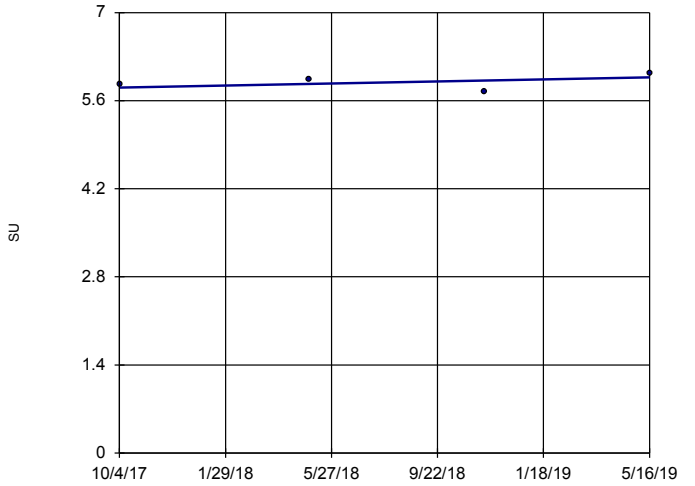
pH

MW-3 (bg)



n = 4

Slope = 0.1008 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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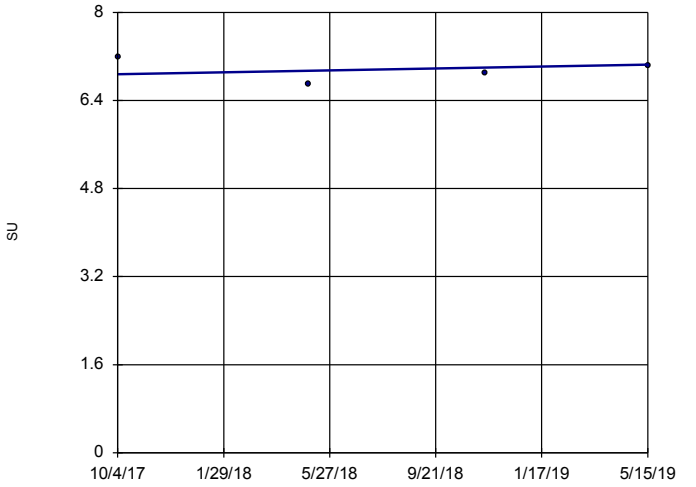
pH

MW-4



n = 4

Slope = 0.1078 units per year.

Mann-Kendall statistic = 0 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).

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The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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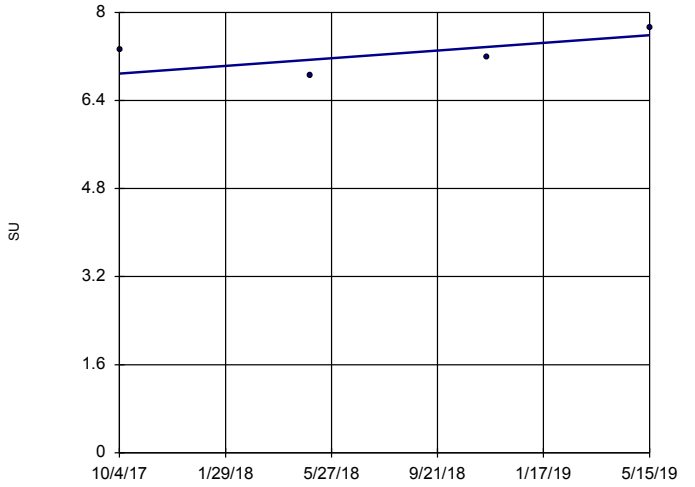
pH

MW-5



n = 4

Slope = 0.4345 units per year.

Mann-Kendall statistic = 2 critical = 8

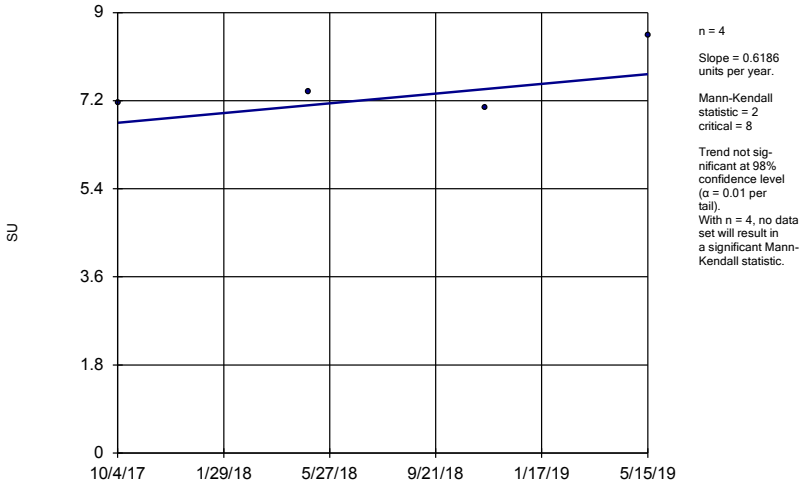
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

pH

MW-5A



n = 4

Slope = 0.6186 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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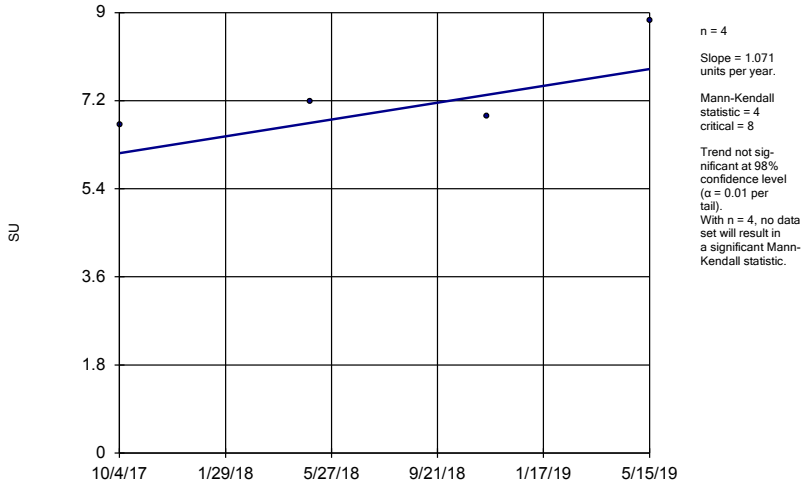
pH

MW-6



n = 4

Slope = 1.071 units per year.

Mann-Kendall statistic = 4 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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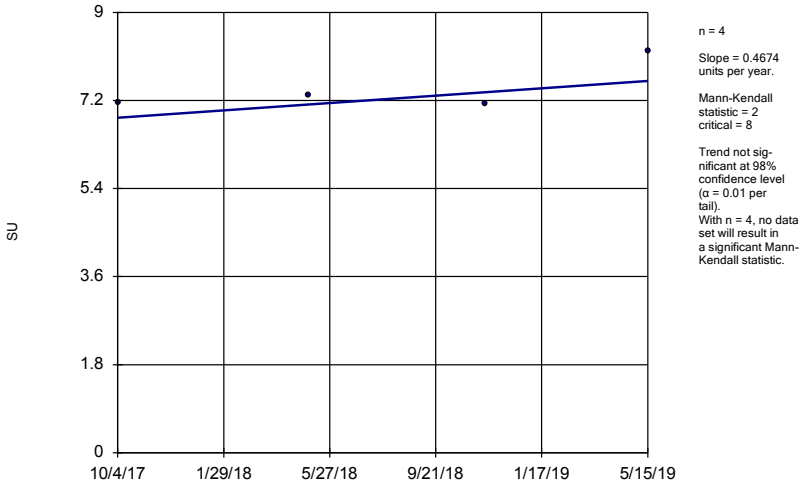
pH

MW-6A



n = 4

Slope = 0.4674 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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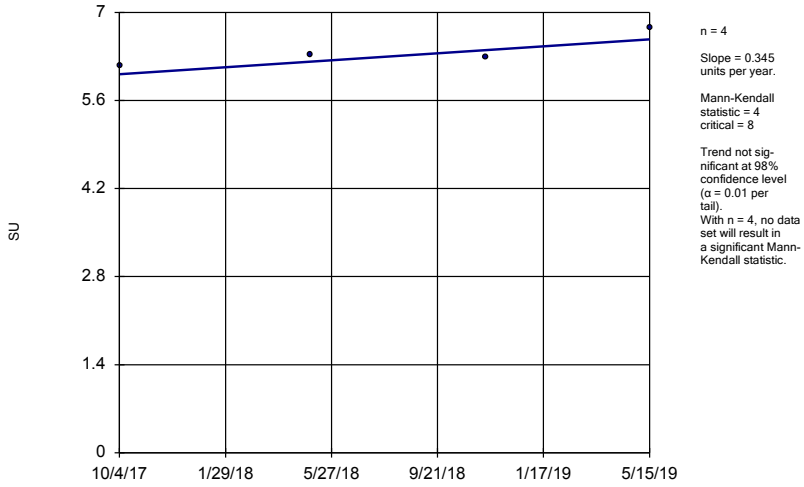
pH

MW-7 (bg)



n = 4

Slope = 0.345 units per year.

Mann-Kendall statistic = 4 critical = 8

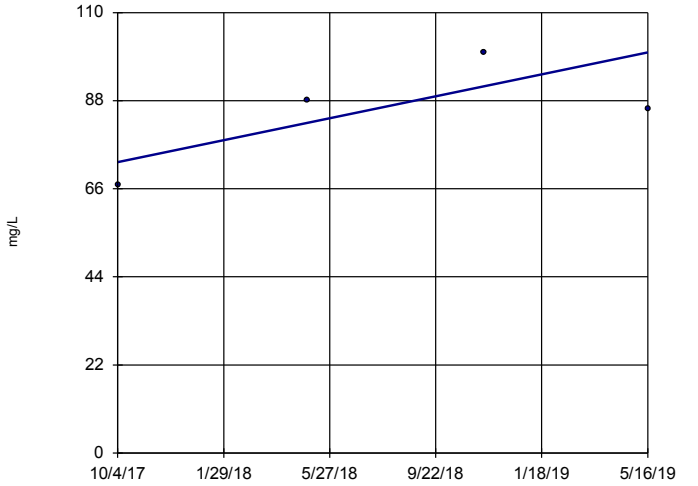
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sulfate

MW-2 (bg)



n = 4

Slope = 17 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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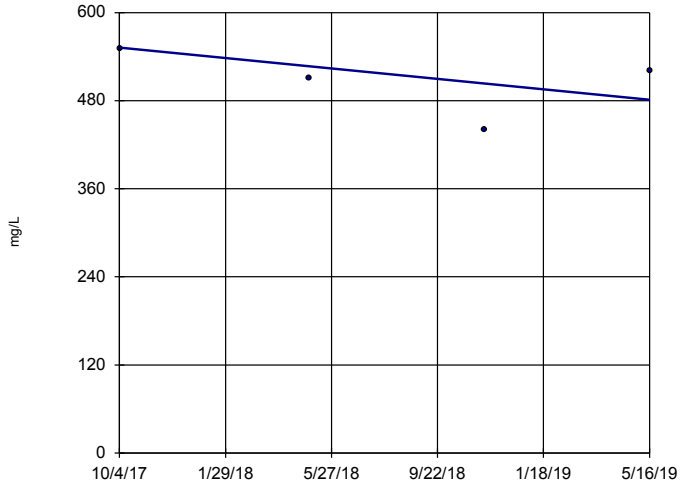
Sulfate

MW-3 (bg)



n = 4

Slope = -44.06 units per year.

Mann-Kendall statistic = -2
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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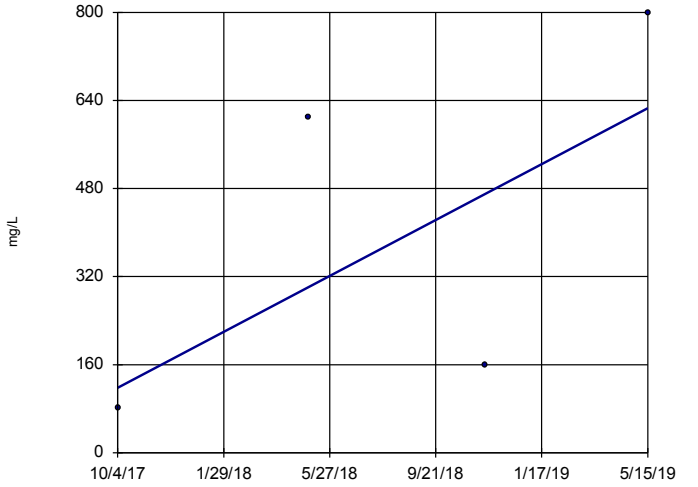
Sulfate

MW-4



n = 4

Slope = 315.1 units per year.

Mann-Kendall statistic = 4
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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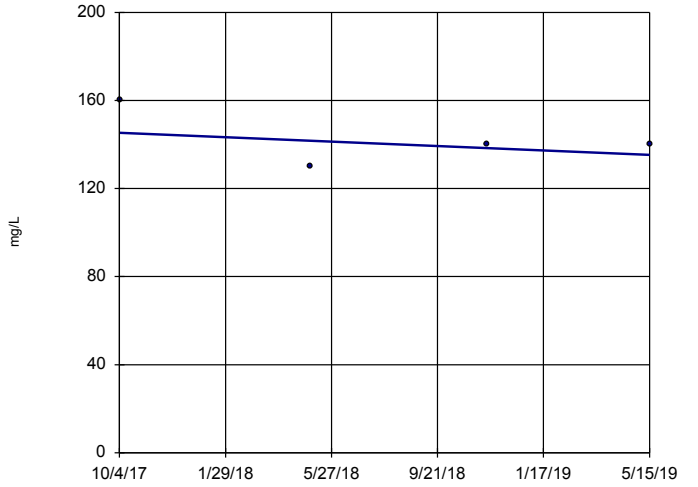
Sulfate

MW-5



n = 4

Slope = -6.207 units per year.

Mann-Kendall statistic = -1
critical = -8

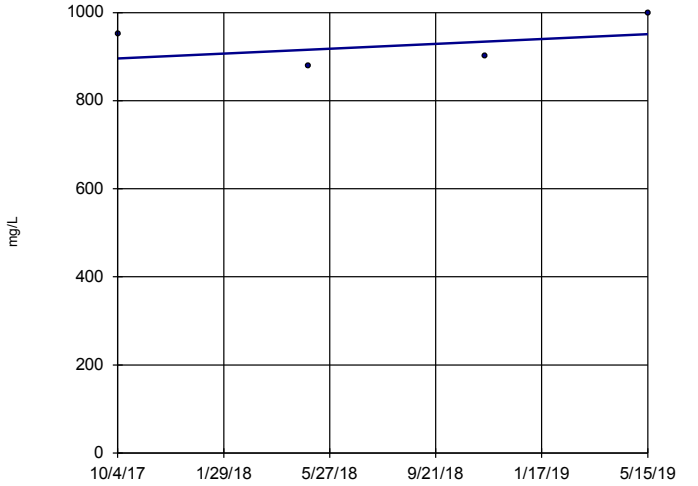
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sulfate

MW-5A



n = 4

Slope = 34.14 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

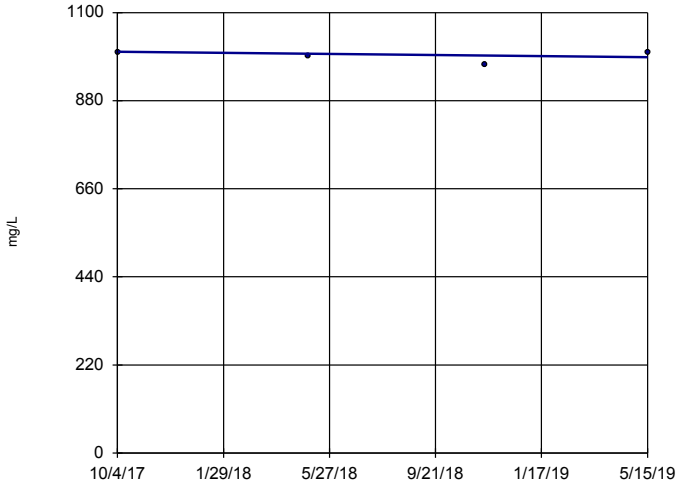
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6



n = 4

Slope = -8.649 units per year.

Mann-Kendall statistic = -1
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

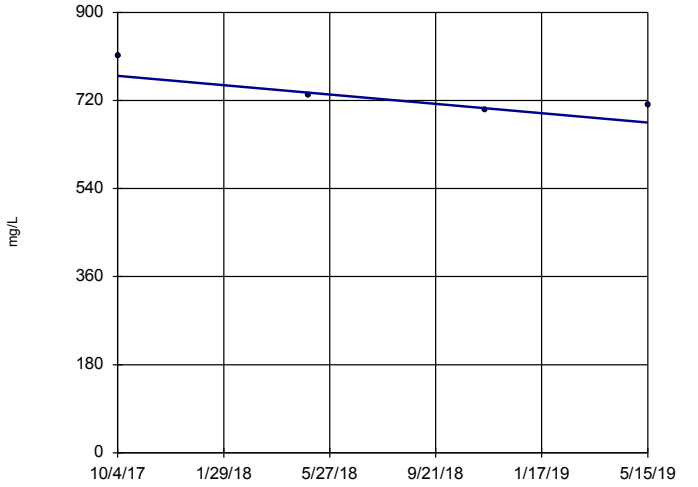
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6A



n = 4

Slope = -58.97 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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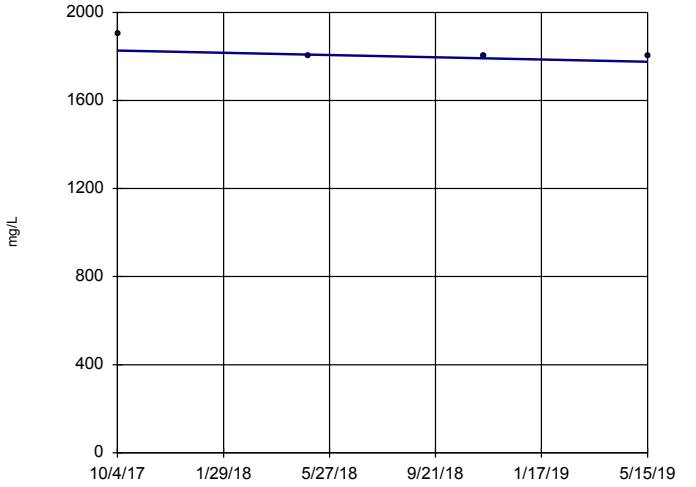
Sulfate

MW-7 (bg)



n = 4

Slope = -31.04 units per year.

Mann-Kendall statistic = -3
critical = -8

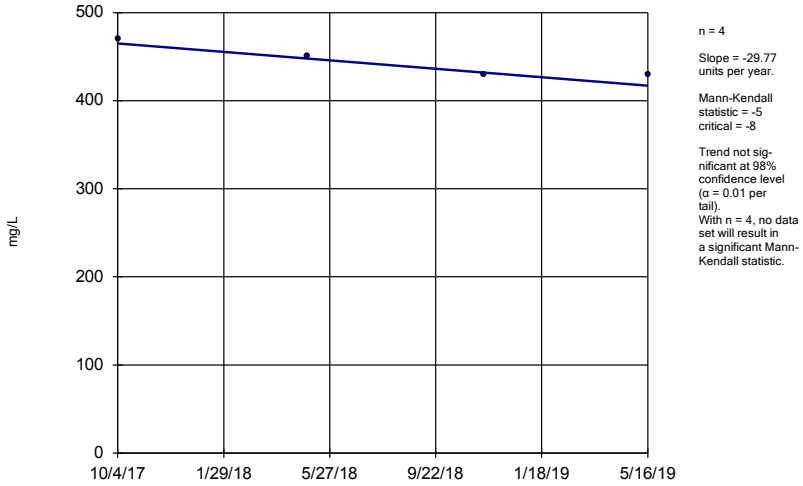
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Total Dissolved Solids

MW-2 (bg)



n = 4

Slope = -29.77 units per year.

Mann-Kendall statistic = -5
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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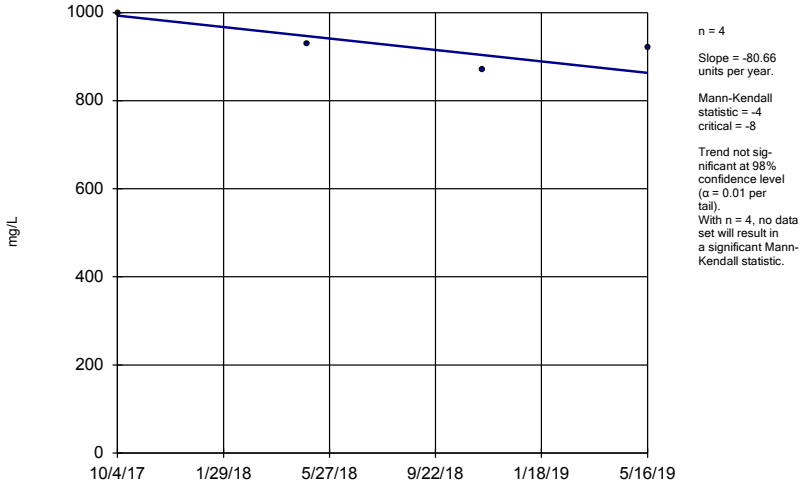
Total Dissolved Solids

MW-3 (bg)



n = 4

Slope = -80.66 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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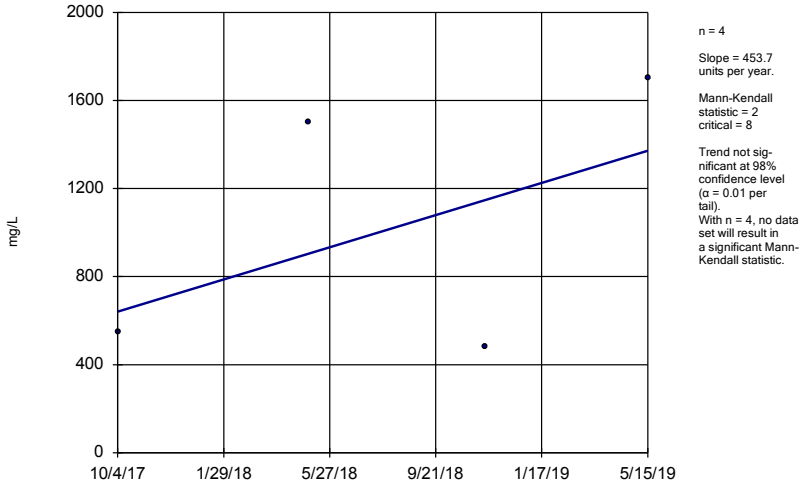
Total Dissolved Solids

MW-4



n = 4

Slope = 453.7 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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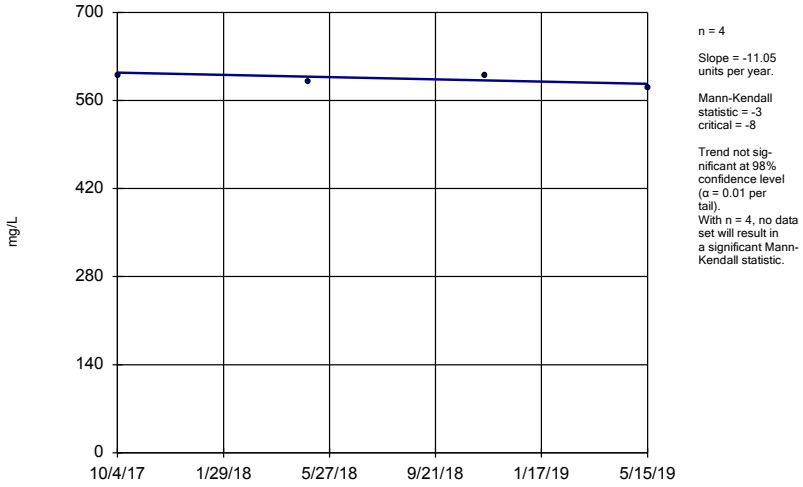
Total Dissolved Solids

MW-5



n = 4

Slope = -11.05 units per year.

Mann-Kendall statistic = -3
critical = -8

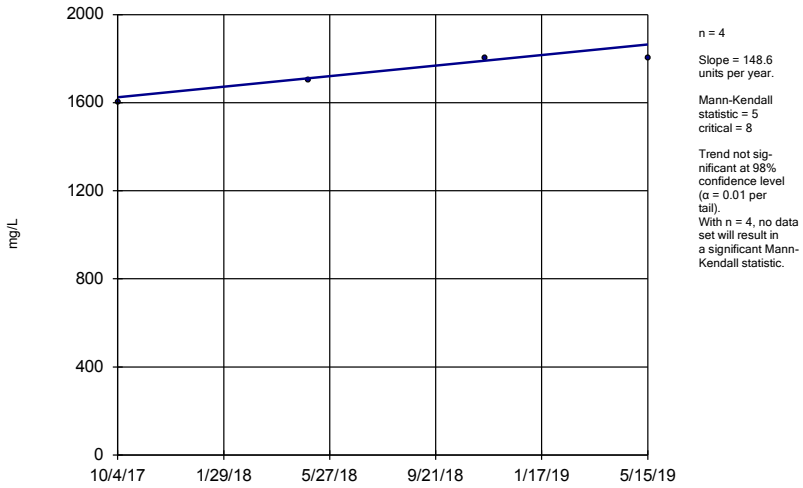
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Total Dissolved Solids

MW-5A



n = 4

Slope = 148.6 units per year.

Mann-Kendall statistic = 5 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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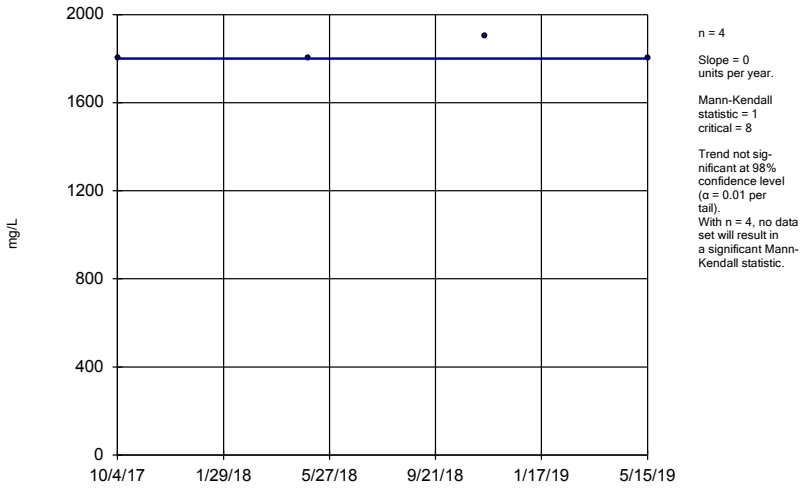
Total Dissolved Solids

MW-6



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = 1 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

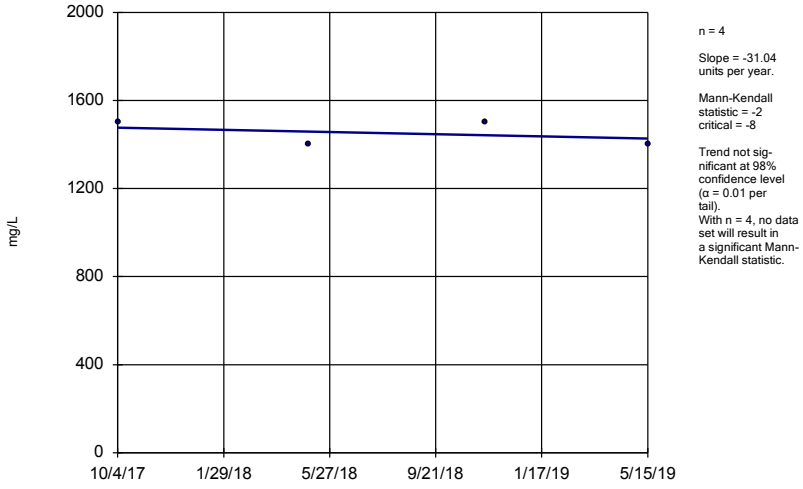
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-6A



n = 4

Slope = -31.04 units per year.

Mann-Kendall statistic = -2 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

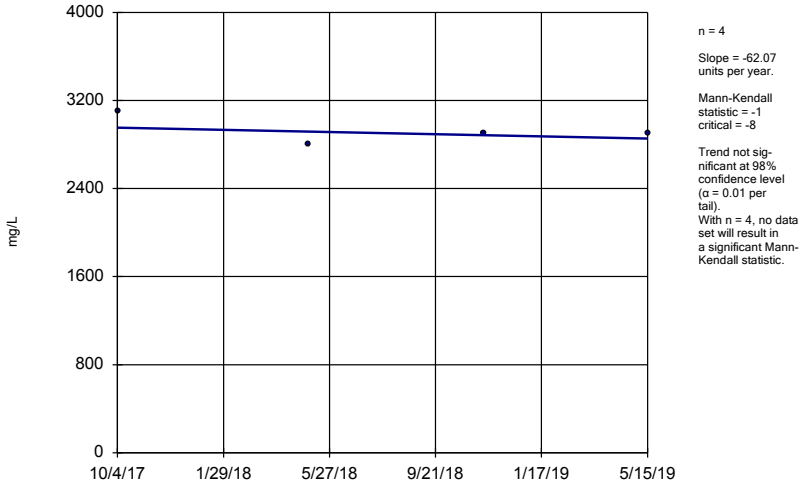
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-7 (bg)



n = 4

Slope = -62.07 units per year.

Mann-Kendall statistic = -1 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background Printed 12/4/2019, 2:13 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-2 (bg)	-0.03847	-4	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3 (bg)	0	-1	-8	No	4	75	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4	0	-1	-8	No	4	75	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5	-0.00...	0	8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5A	0.1202	5	8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6	-0.01279	-2	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6A	-0.01589	-3	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-7 (bg)	-0.03739	-2	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2 (bg)	-4.716	-3	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3 (bg)	1.378	0	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4	44.63	2	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5	5.214	4	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5A	14.15	4	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6	3.104	1	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6A	-7.588	-4	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-7 (bg)	-1.737	0	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2 (bg)	0	0	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3 (bg)	3.596	1	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4	29.71	2	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5	-0.08649	-1	-8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5A	6.828	5	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6	0.3104	3	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6A	0	-1	-8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-7 (bg)	5.041	4	8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2 (bg)	-0.09492	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3 (bg)	-0.02236	-2	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4	-0.01862	-1	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5	-0.00...	0	8	No	4	25	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5A	-0.05035	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6	-0.03966	-3	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6A	-0.04189	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-7 (bg)	-0.01557	-2	-8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-2 (bg)	-0.0689	-2	-8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-3 (bg)	0.1008	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-4	0.1078	0	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-5	0.4345	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-5A	0.6186	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-6	1.071	4	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-6A	0.4674	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-7 (bg)	0.345	4	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2 (bg)	17	2	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3 (bg)	-44.06	-2	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4	315.1	4	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5	-6.207	-1	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5A	34.14	2	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6	-8.649	-1	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6A	-58.97	-4	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-7 (bg)	-31.04	-3	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-2 (bg)	-29.77	-5	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-3 (bg)	-80.66	-4	-8	No	4	0	n/a	n/a	0.02	NP

Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background Printed 12/4/2019, 2:13 PM

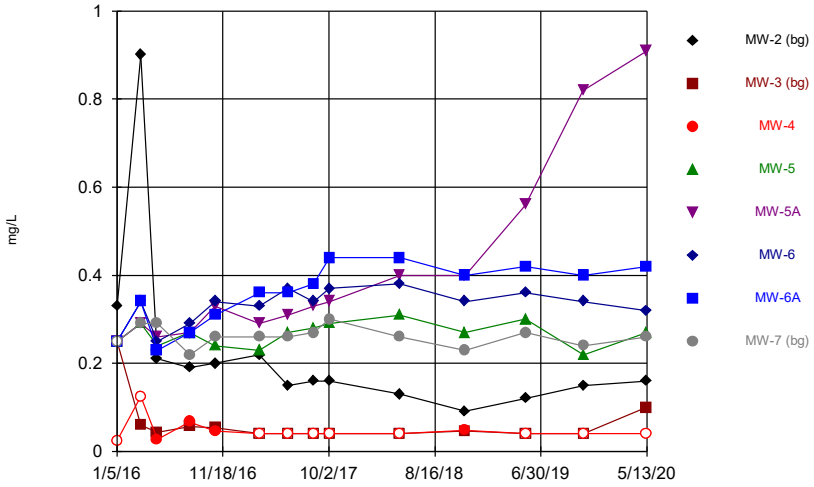
Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Total Dissolved Solids (mg/L)	MW-4	453.7	2	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5	-11.05	-3	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5A	148.6	5	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6	0	1	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6A	-31.04	-2	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-7 (bg)	-62.07	-1	-8	No	4	0	n/a	n/a	0.02	NP

Sanitas™ Output – Sampling Event

Time Series Analysis

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

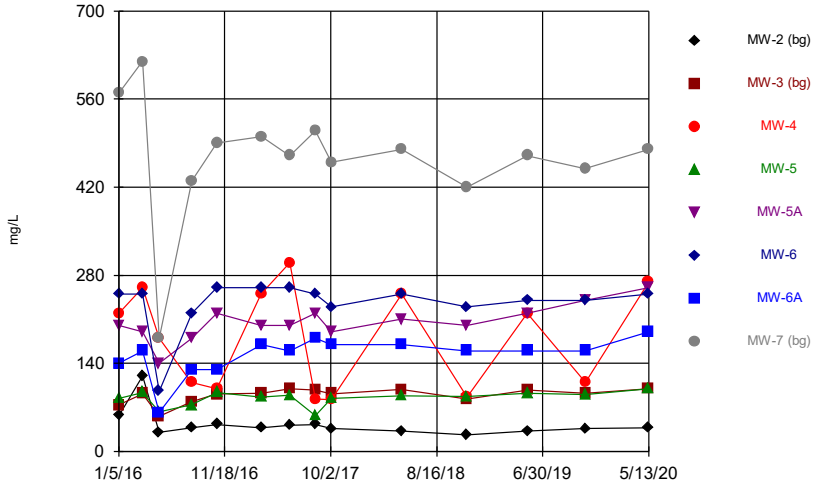


Time Series Analysis Run 6/3/2020 2:31 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

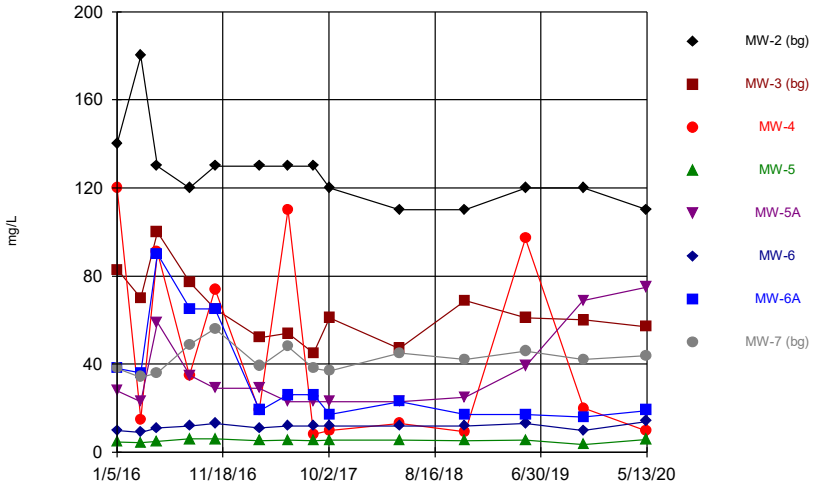


Time Series Analysis Run 6/3/2020 2:31 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

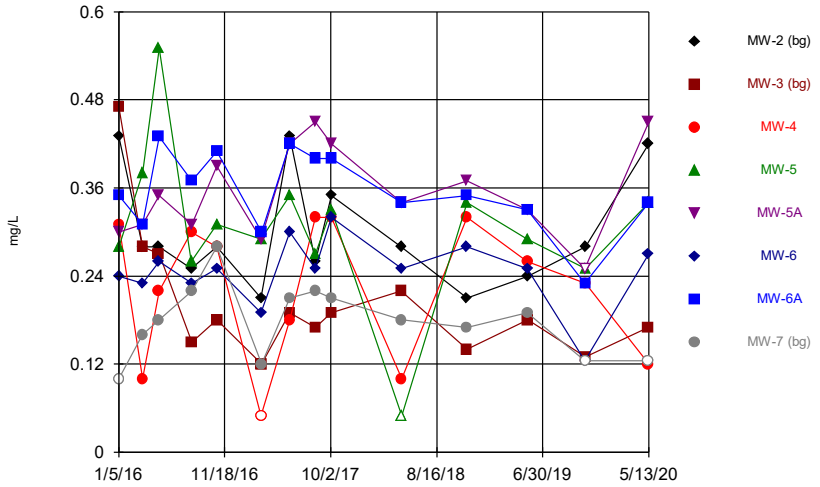


Time Series Analysis Run 6/3/2020 2:31 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

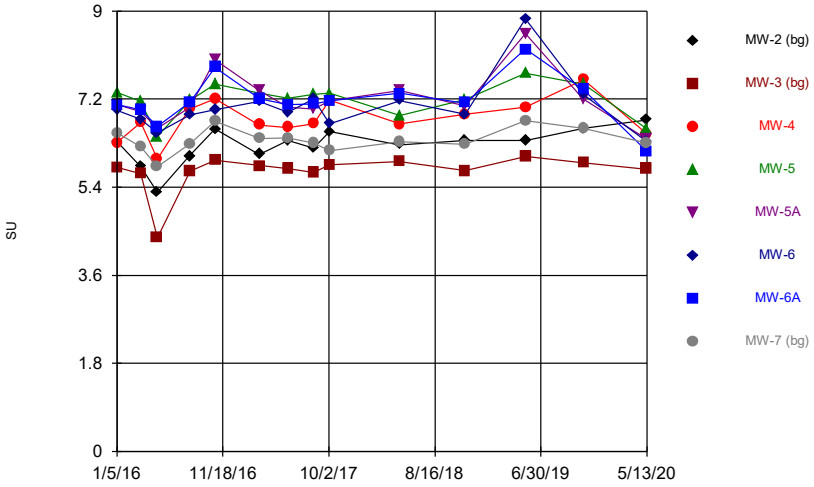
Fluoride



Time Series Analysis Run 6/3/2020 2:31 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

pH

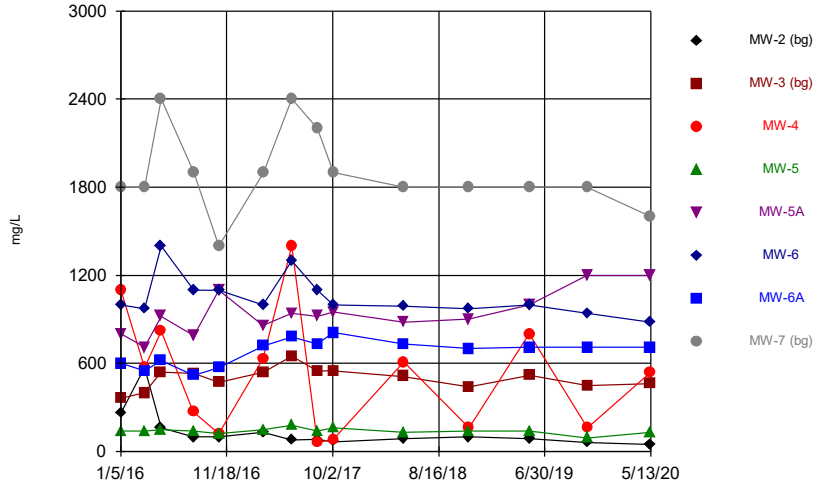


Time Series Analysis Run 6/3/2020 2:32 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

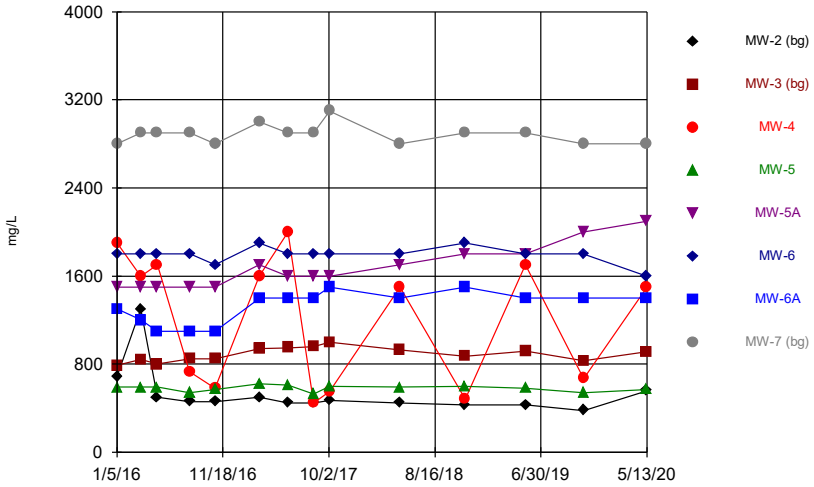


Time Series Analysis Run 6/3/2020 2:32 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids



Time Series Analysis Run 6/3/2020 2:32 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ Output – Sampling Event

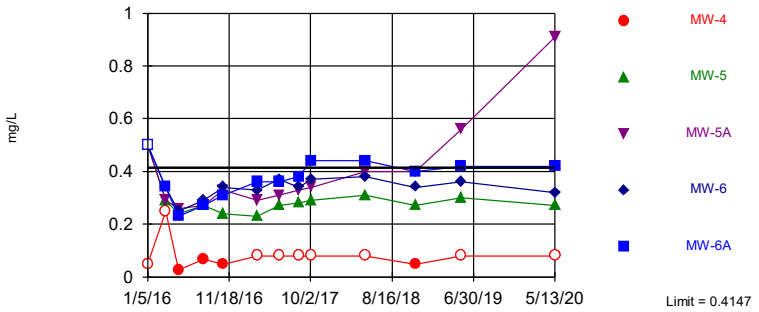
Prediction Limits

Hollow symbols indicate censored values.

Exceeds Limit: MW-5A, MW-6A

Boron

Interwell Parametric



Background Data Summary (based on square root transformation) (after Kaplan-Meier Adjustment): Mean=0.3572, Std. Dev.=0.1513, n=39, 20.51% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.917, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

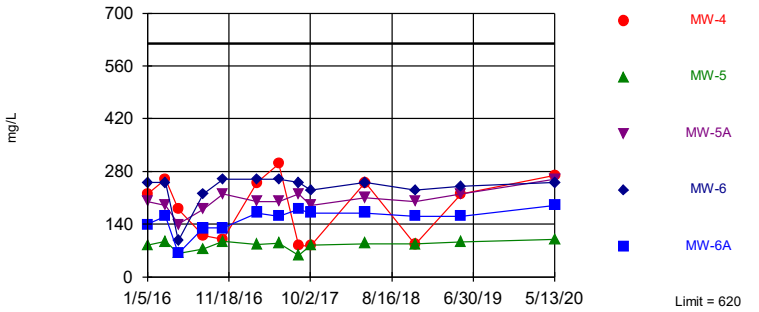
Prediction Limit Analysis Run 6/3/2020 2:38 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Within Limit

Calcium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

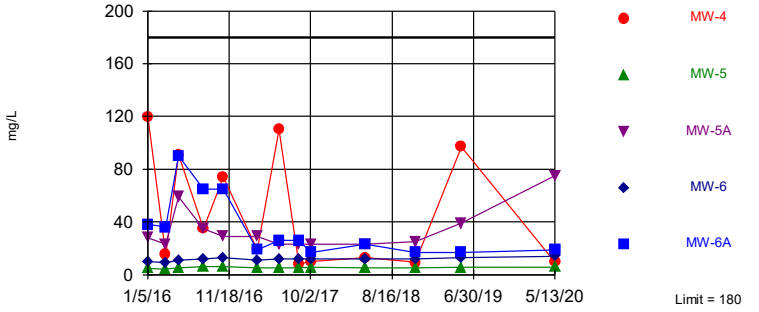
Prediction Limit Analysis Run 6/3/2020 2:38 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Within Limit

Chloride

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 6/3/2020 2:38 PM

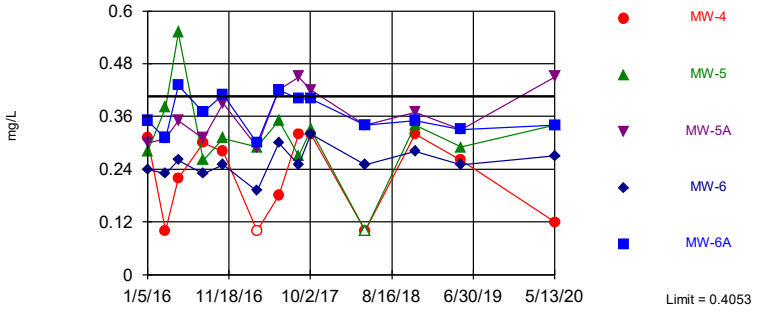
The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Exceeds Limit: MW-5A

Fluoride

Interwell Parametric



Background Data Summary (based on square root transformation): Mean=0.4799, Std. Dev.=0.08269, n=39, 5.128% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9223, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

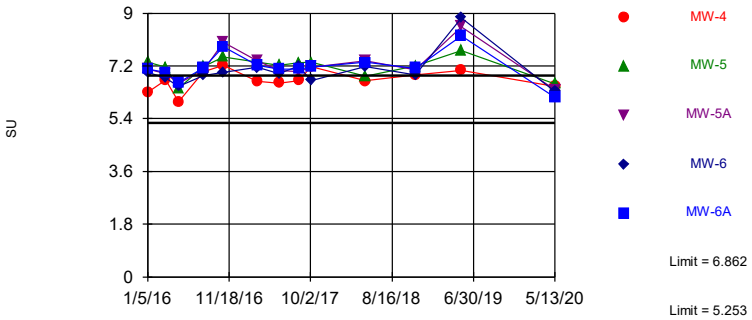
Prediction Limit Analysis Run 6/3/2020 2:38 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Within Limits

pH

Interwell Parametric



Background Data Summary (based on square transformation): Mean=37.34, Std. Dev.=5.141, n=39. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9271, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.000752. Comparing 5 points to limit.

Prediction Limit Analysis Run 6/3/2020 2:38 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

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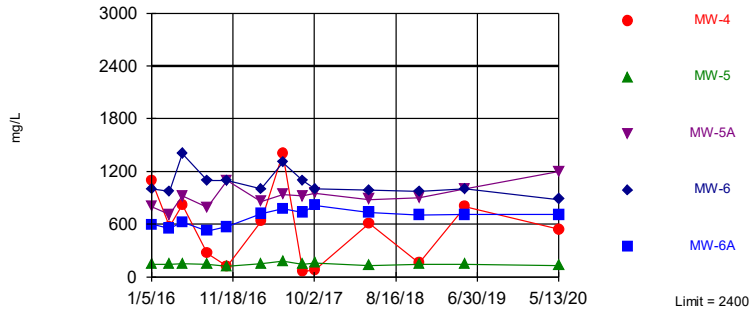
Within Limit

Sulfate

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 6/3/2020 2:39 PM

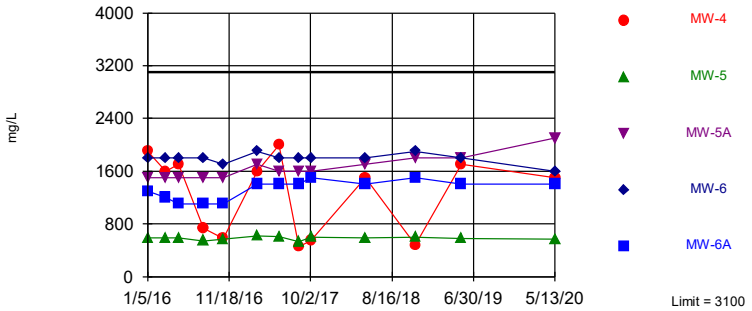
The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Within Limit

Total Dissolved Solids

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 6/3/2020 2:39 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

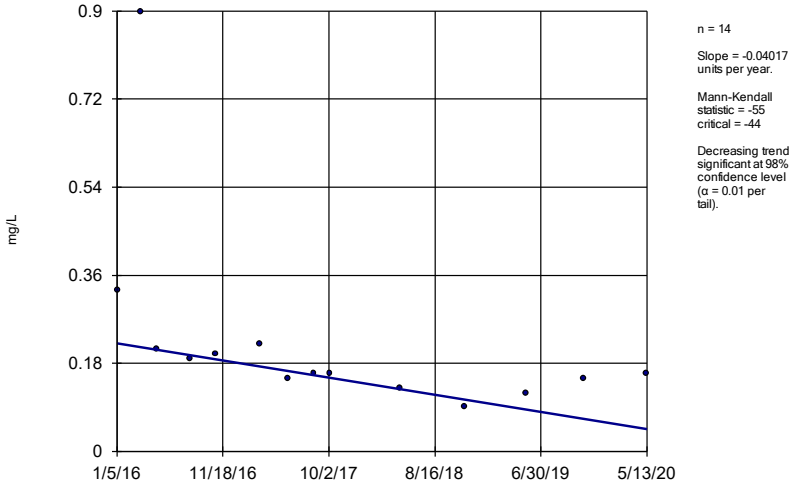
Prediction Limit

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background Printed 6/3/2020, 2:39 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	MW-4	0.4147	n/a	5/13/2020	0.08ND	No	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-5	0.4147	n/a	5/13/2020	0.27	No	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Boron (mg/L)	**MW-5A**	**0.4147**	**n/a**	**5/13/2020**	**0.91**	**Yes**	**39**	**20.51**	**sqrt(x)**	**0.001504**	**Param Inter 1 of 2**
Boron (mg/L)	MW-6	0.4147	n/a	5/13/2020	0.32	No	39	20.51	sqrt(x)	0.001504	Param Inter 1 of 2
Boron (mg/L)	**MW-6A**	**0.4147**	**n/a**	**5/13/2020**	**0.42**	**Yes**	**39**	**20.51**	**sqrt(x)**	**0.001504**	**Param Inter 1 of 2**
Calcium (mg/L)	MW-4	620	n/a	5/13/2020	270	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-5	620	n/a	5/13/2020	100	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-5A	620	n/a	5/13/2020	260	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-6	620	n/a	5/13/2020	250	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-6A	620	n/a	5/13/2020	190	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-4	180	n/a	5/13/2020	9.7	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-5	180	n/a	5/13/2020	5.8	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-5A	180	n/a	5/13/2020	75	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-6	180	n/a	5/13/2020	14	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-6A	180	n/a	5/13/2020	19	No	39	0	n/a	0.0012	NP Inter (normality) ...
Fluoride (mg/L)	MW-4	0.4053	n/a	5/13/2020	0.12	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-5	0.4053	n/a	5/13/2020	0.34	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	**MW-5A**	**0.4053**	**n/a**	**5/13/2020**	**0.45**	**Yes**	**39**	**5.128**	**sqrt(x)**	**0.001504**	**Param Inter 1 of 2**
Fluoride (mg/L)	MW-6	0.4053	n/a	5/13/2020	0.27	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-6A	0.4053	n/a	5/13/2020	0.34	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
pH (SU)	MW-4	6.862	5.253	5/13/2020	6.49	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-5	6.862	5.253	5/13/2020	6.59	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-5A	6.862	5.253	5/13/2020	6.38	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-6	6.862	5.253	5/13/2020	6.33	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	MW-6A	6.862	5.253	5/13/2020	6.13	No	39	0	x^2	0.000752	Param Inter 1 of 2
Sulfate (mg/L)	MW-4	2400	n/a	5/13/2020	540	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-5	2400	n/a	5/13/2020	130	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-5A	2400	n/a	5/13/2020	1200	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-6	2400	n/a	5/13/2020	880	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-6A	2400	n/a	5/13/2020	710	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-4	3100	n/a	5/13/2020	1500	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-5	3100	n/a	5/13/2020	570	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-5A	3100	n/a	5/13/2020	2100	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-6	3100	n/a	5/13/2020	1600	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-6A	3100	n/a	5/13/2020	1400	No	39	0	n/a	0.0012	NP Inter (normality) ...

Boron

MW-2 (bg)



n = 14

Slope = -0.04017 units per year.

Mann-Kendall statistic = -55 critical = -44

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

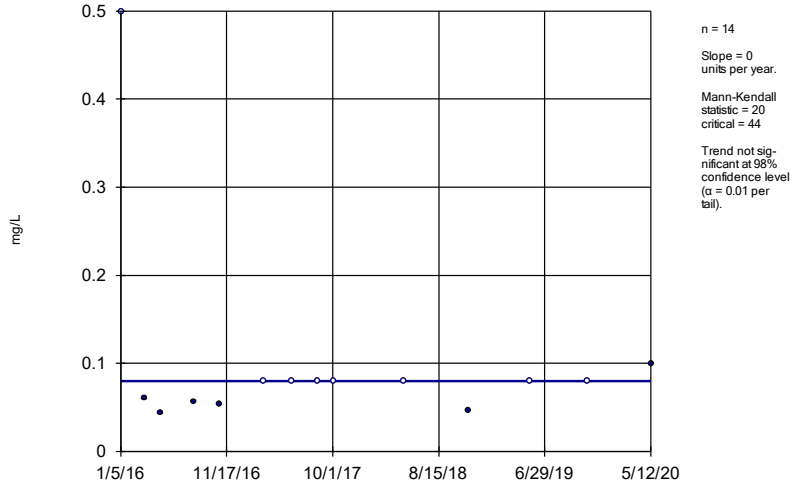
Sen's Slope Estimator Analysis Run 6/3/2020 2:59 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Boron

MW-3 (bg)



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = 20 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

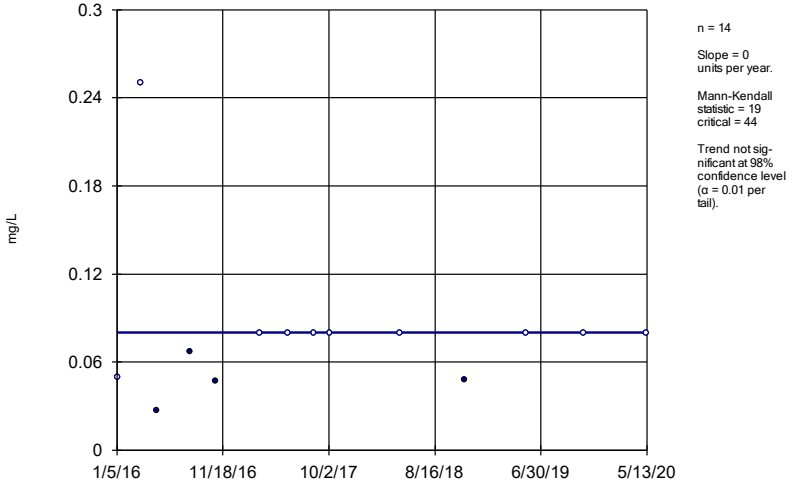
Sen's Slope Estimator Analysis Run 6/3/2020 2:59 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Boron

MW-4



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = 19 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

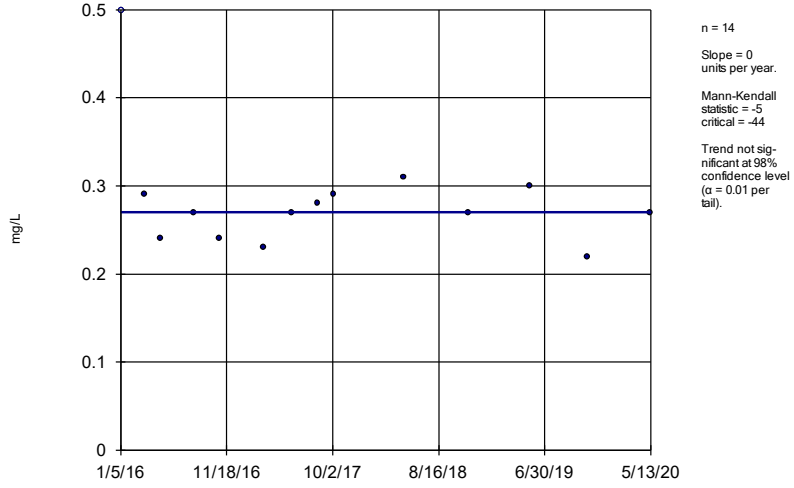
Sen's Slope Estimator Analysis Run 6/3/2020 2:59 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Boron

MW-5



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = -5 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

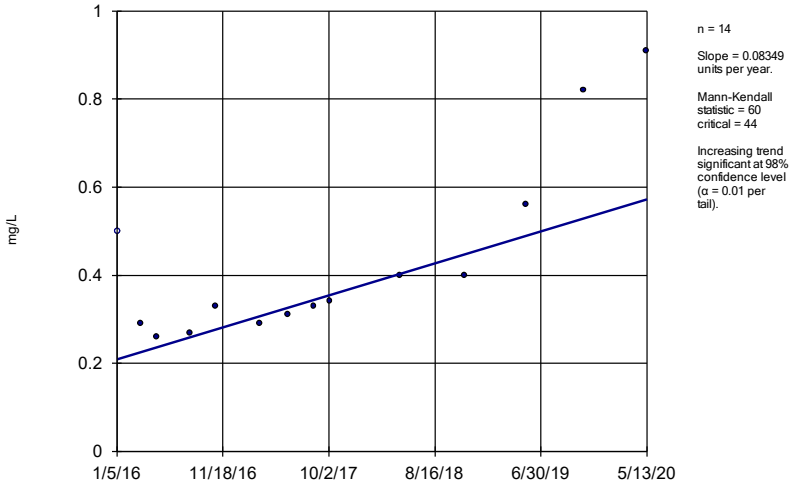
Sen's Slope Estimator Analysis Run 6/3/2020 2:59 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-5A



n = 14

Slope = 0.08349 units per year.

Mann-Kendall statistic = 60
critical = 44

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

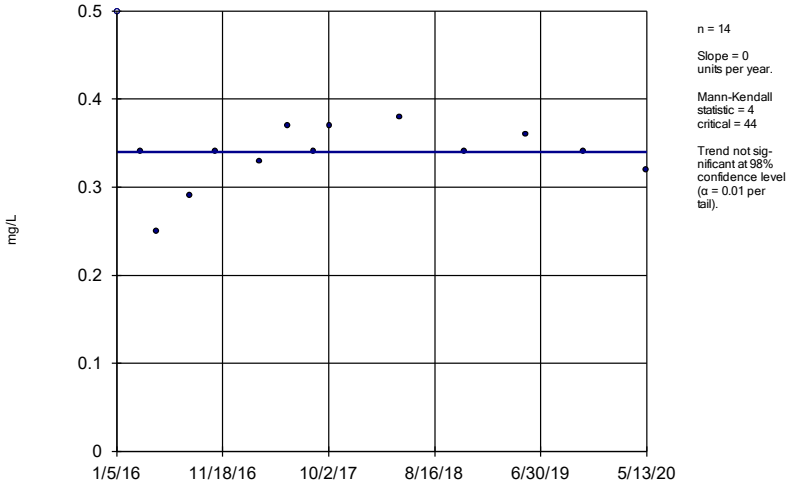
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-6



n = 14

Slope = 0
units per year.

Mann-Kendall statistic = 4
critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

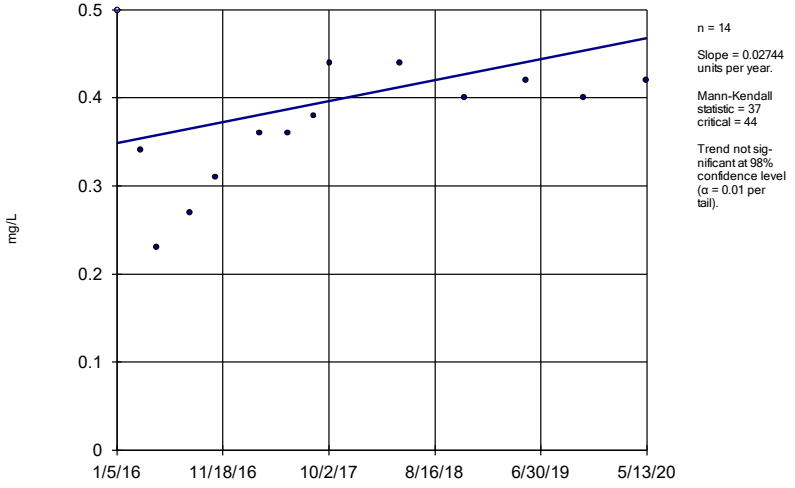
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-6A



n = 14

Slope = 0.02744 units per year.

Mann-Kendall statistic = 37
critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

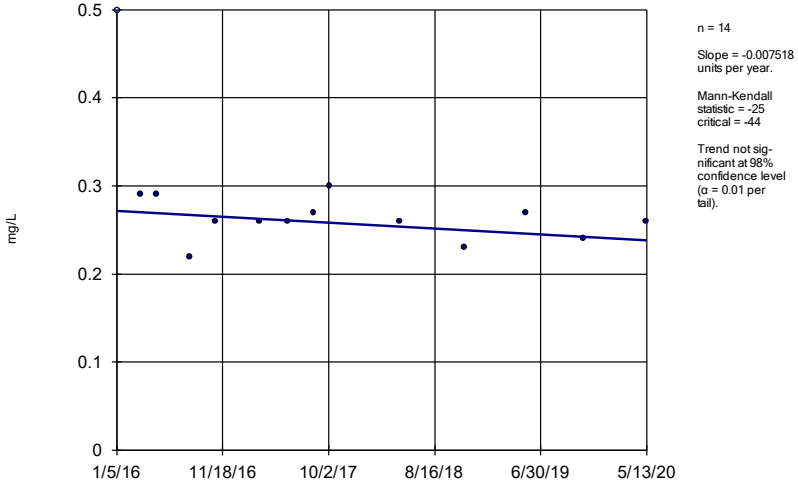
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-7 (bg)



n = 14

Slope = -0.007518 units per year.

Mann-Kendall statistic = -25
critical = -44

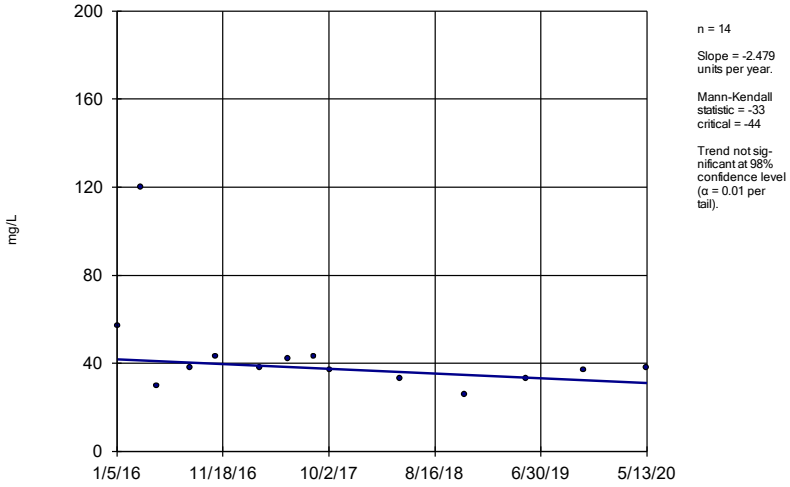
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Calcium

MW-2 (bg)



n = 14

Slope = -2.479 units per year.

Mann-Kendall statistic = -33
critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

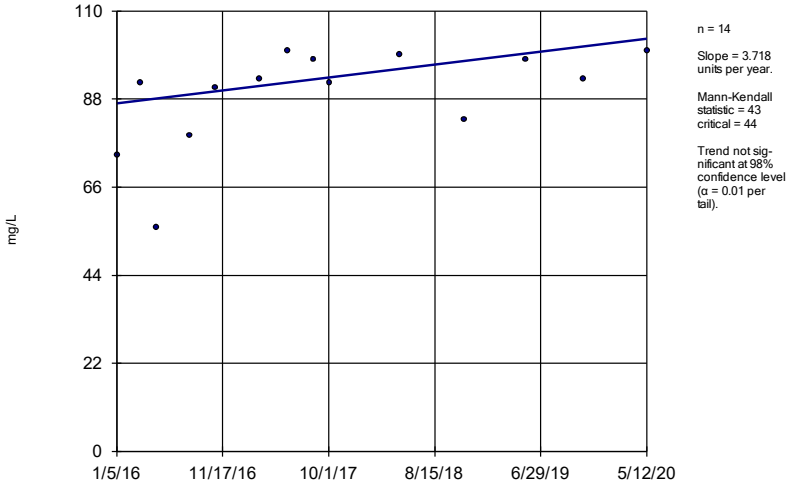
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-3 (bg)



n = 14

Slope = 3.718 units per year.

Mann-Kendall statistic = 43
critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

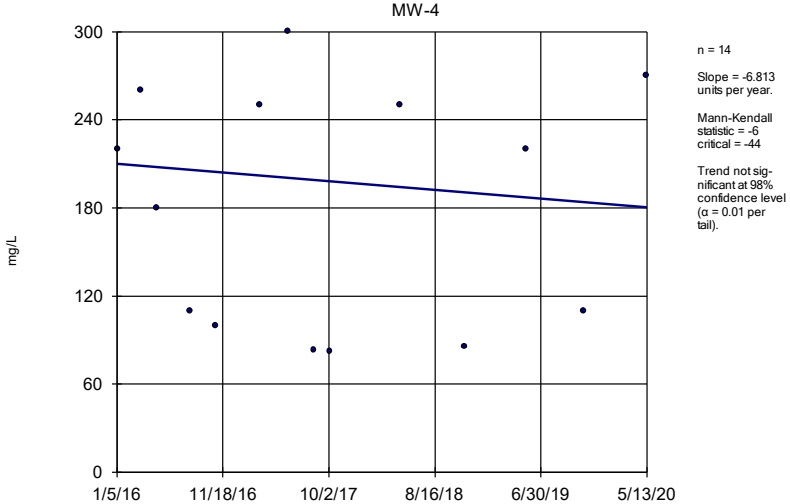
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-4



n = 14

Slope = -6.813 units per year.

Mann-Kendall statistic = -6
critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

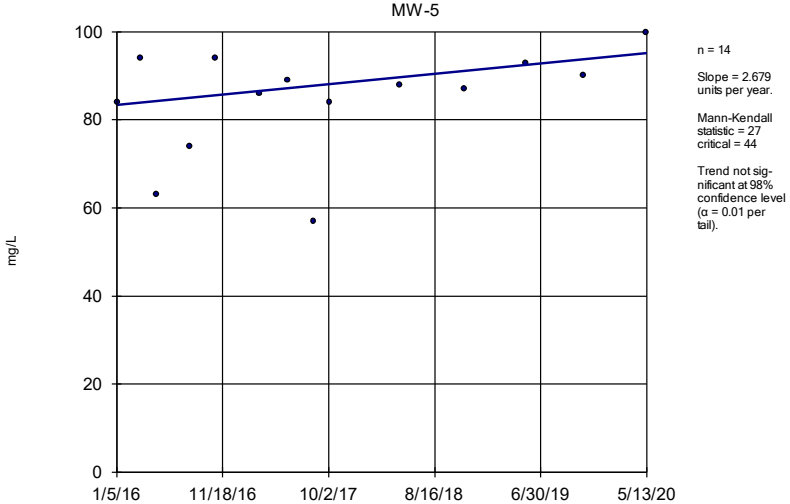
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-5



n = 14

Slope = 2.679 units per year.

Mann-Kendall statistic = 27
critical = 44

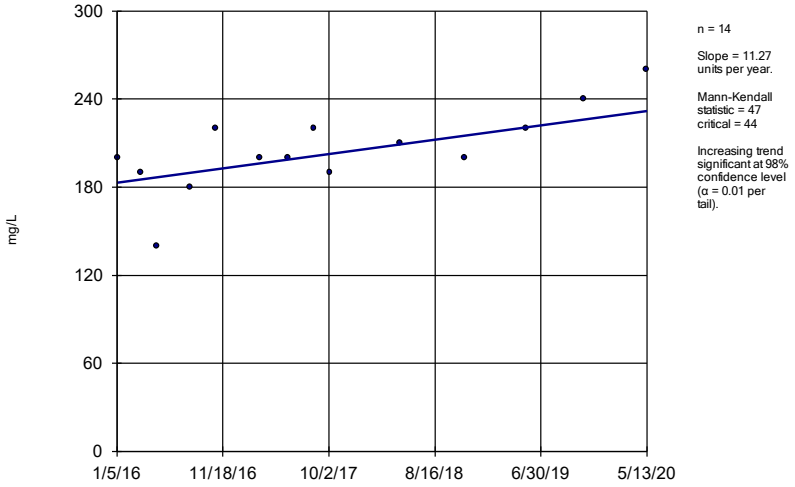
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Calcium

MW-5A



n = 14

Slope = 11.27 units per year.

Mann-Kendall statistic = 47 critical = 44

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

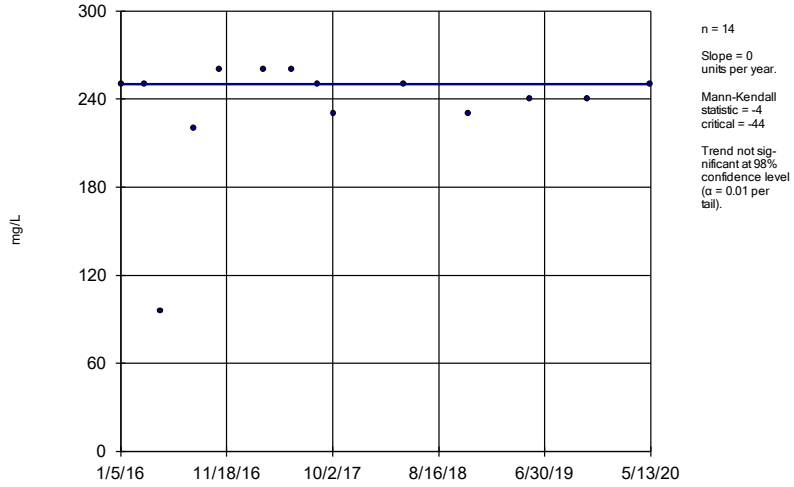
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-6



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = -4 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

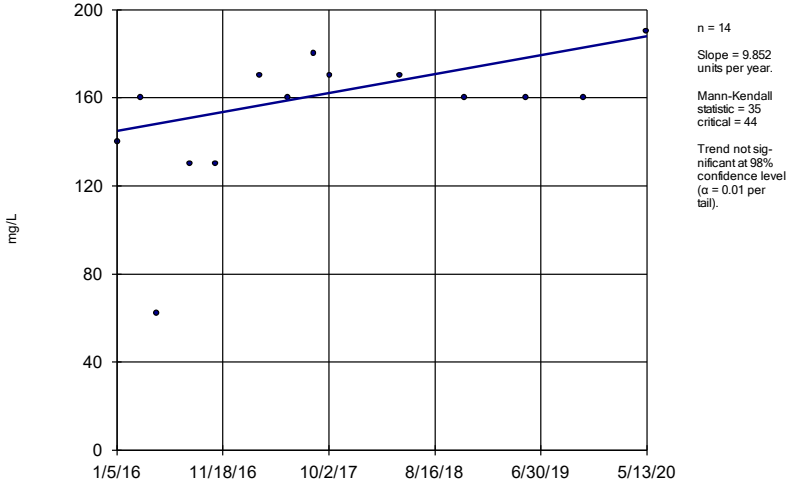
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-6A



n = 14

Slope = 9.852 units per year.

Mann-Kendall statistic = 35 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

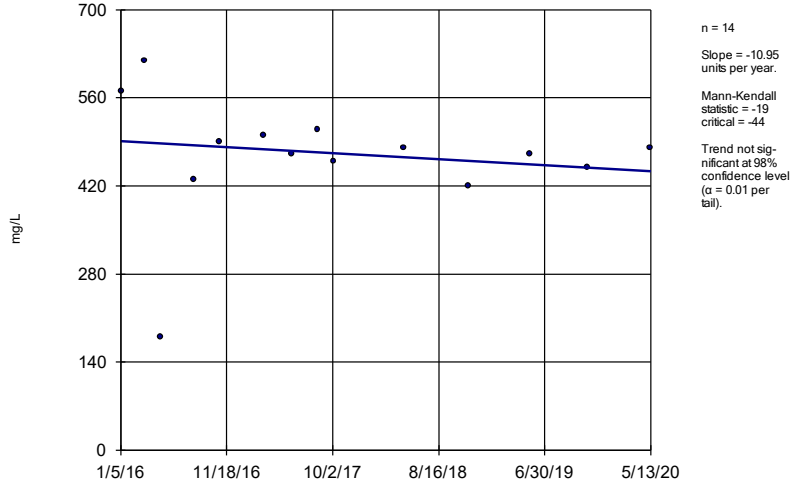
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-7 (bg)



n = 14

Slope = -10.95 units per year.

Mann-Kendall statistic = -19 critical = -44

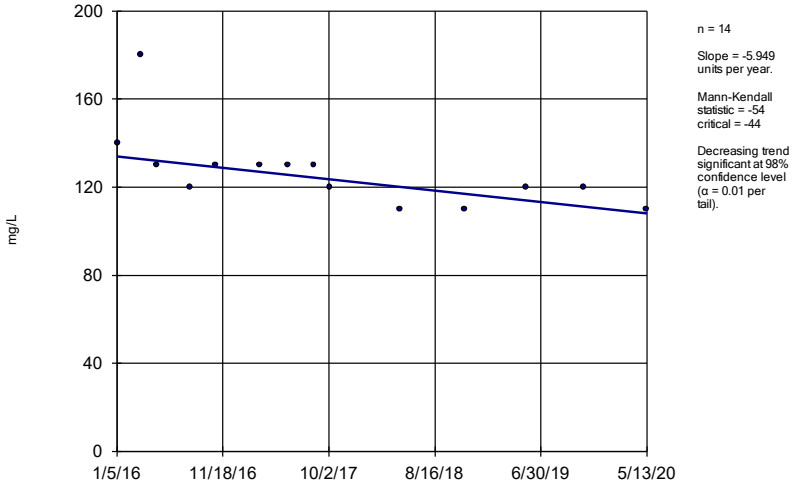
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Chloride

MW-2 (bg)



n = 14

Slope = -5.949 units per year.

Mann-Kendall statistic = -54
critical = -44

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

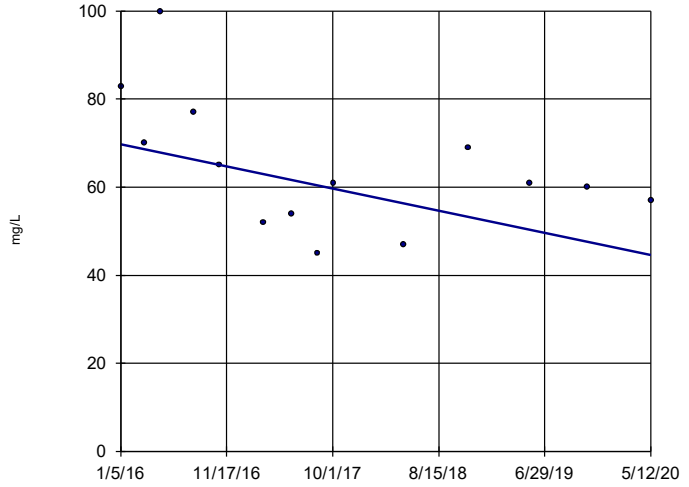
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-3 (bg)



n = 14

Slope = -5.794 units per year.

Mann-Kendall statistic = -38
critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

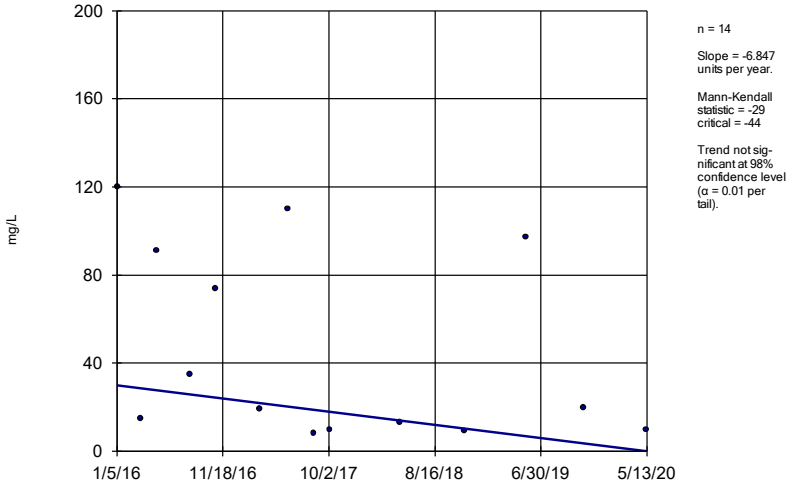
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-4



n = 14

Slope = -6.847 units per year.

Mann-Kendall statistic = -29
critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

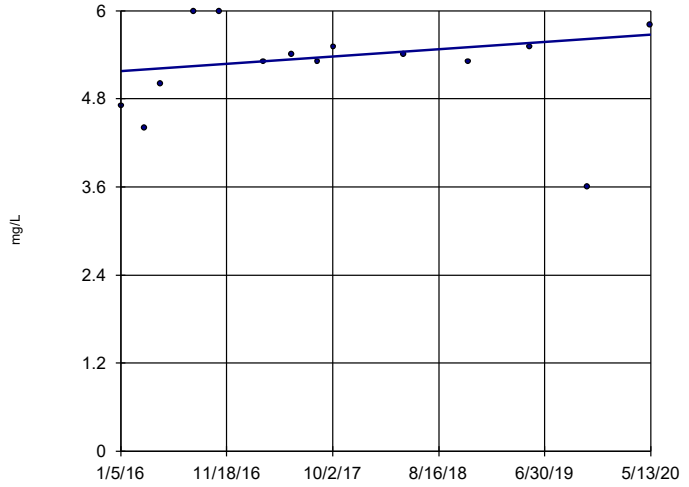
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-5



n = 14

Slope = 0.115 units per year.

Mann-Kendall statistic = 17
critical = 44

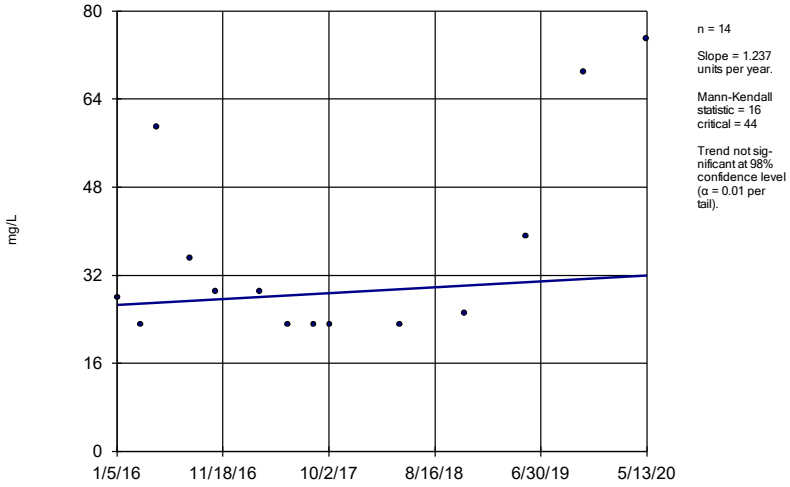
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Chloride

MW-5A



n = 14

Slope = 1.237 units per year.

Mann-Kendall statistic = 16 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

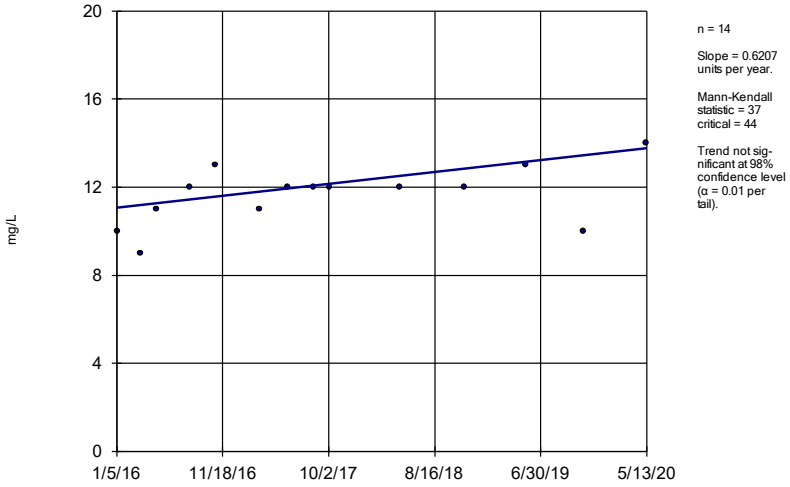
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6



n = 14

Slope = 0.6207 units per year.

Mann-Kendall statistic = 37 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

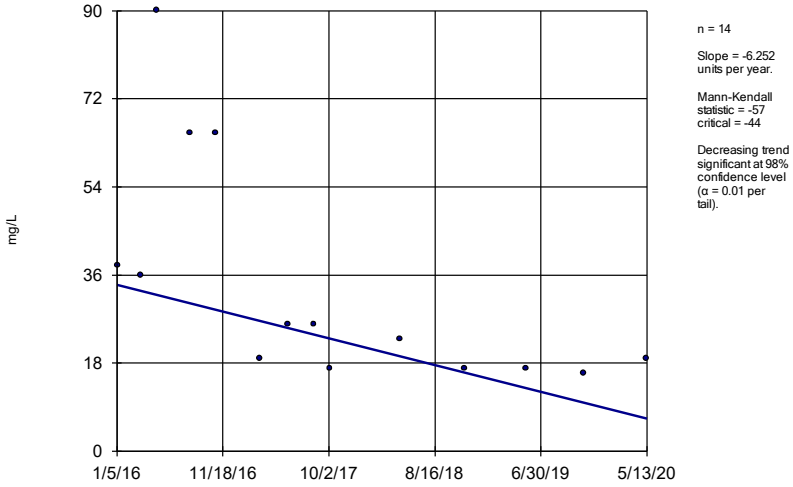
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6A



n = 14

Slope = -6.252 units per year.

Mann-Kendall statistic = -57 critical = -44

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

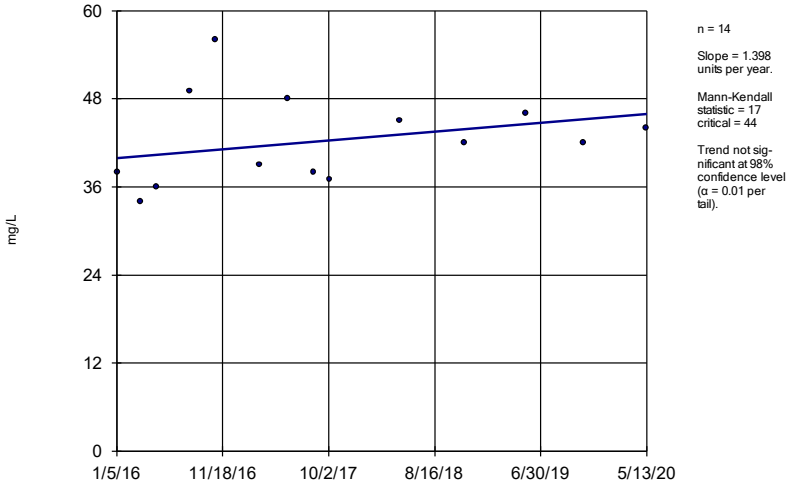
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-7 (bg)



n = 14

Slope = 1.398 units per year.

Mann-Kendall statistic = 17 critical = 44

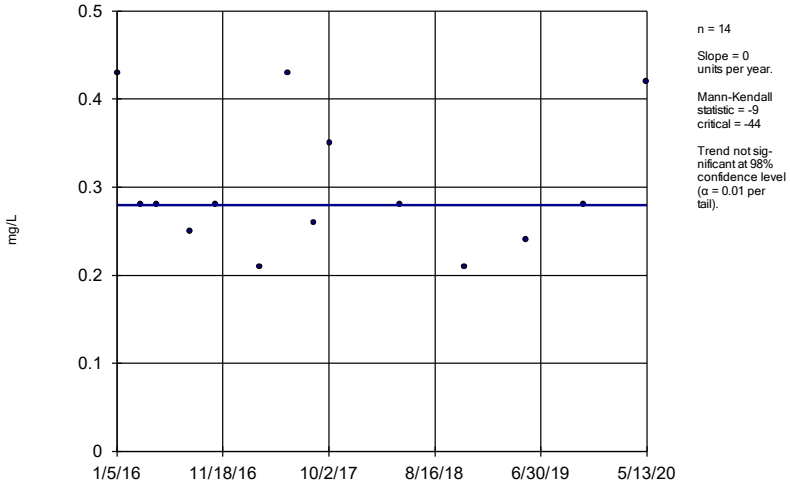
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Fluoride

MW-2 (bg)



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = -9 critical = -44

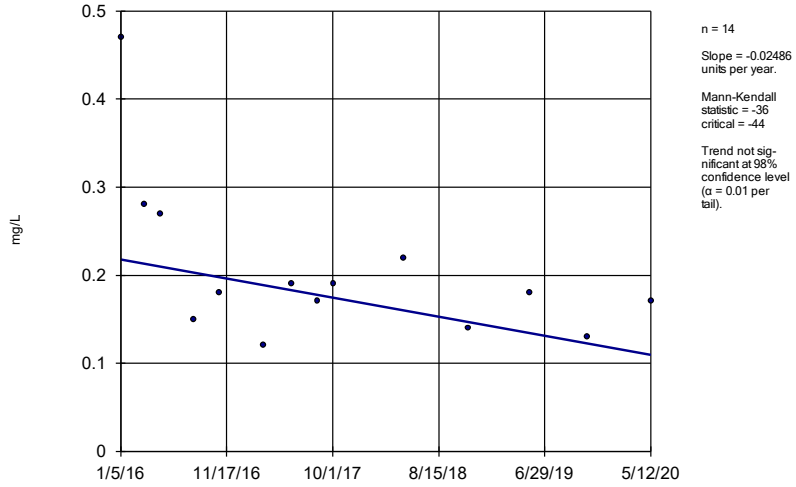
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Fluoride

MW-3 (bg)



n = 14

Slope = -0.02486 units per year.

Mann-Kendall statistic = -36 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

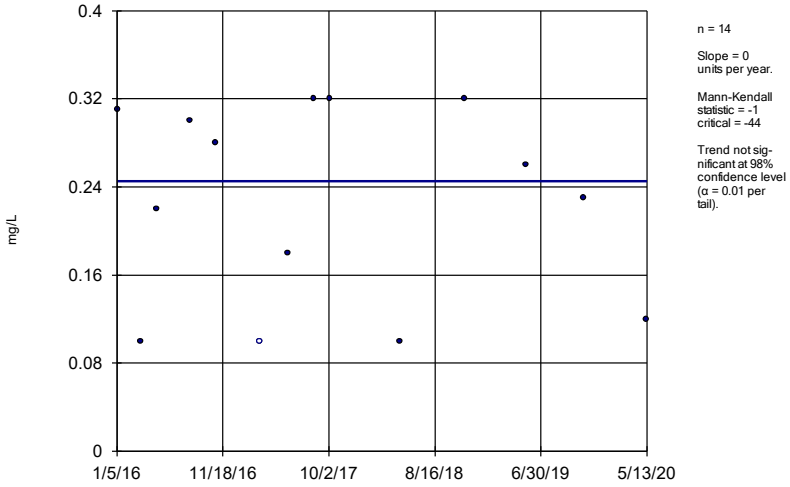
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Fluoride

MW-4



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = -1 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

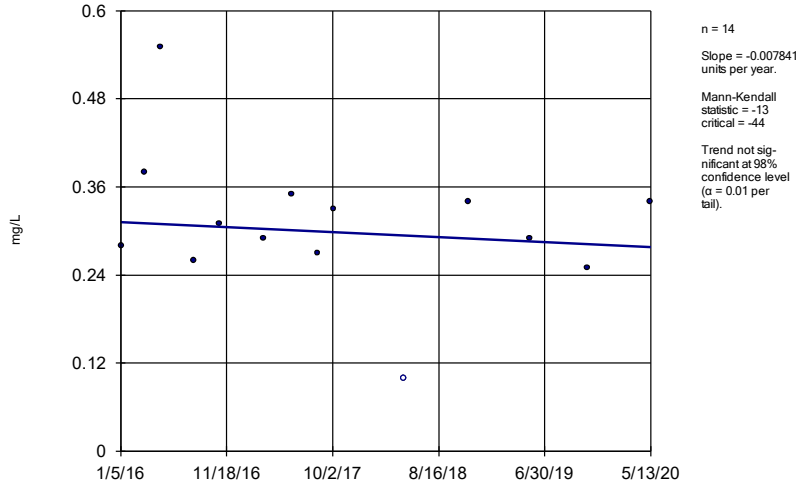
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Fluoride

MW-5



n = 14

Slope = -0.007841 units per year.

Mann-Kendall statistic = -13 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

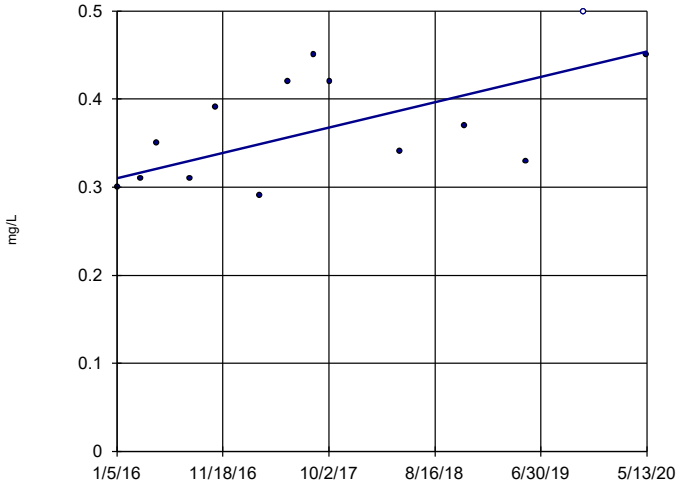
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Fluoride

MW-5A



n = 14

Slope = 0.03299 units per year.

Mann-Kendall statistic = 40
critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

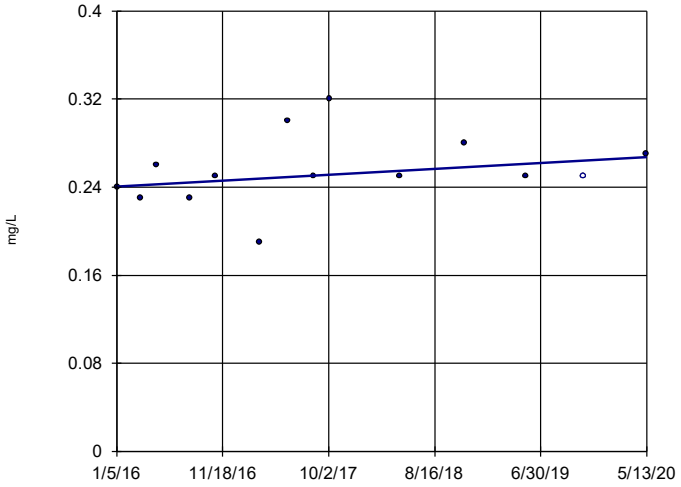
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Fluoride

MW-6



n = 14

Slope = 0.006186 units per year.

Mann-Kendall statistic = 26
critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

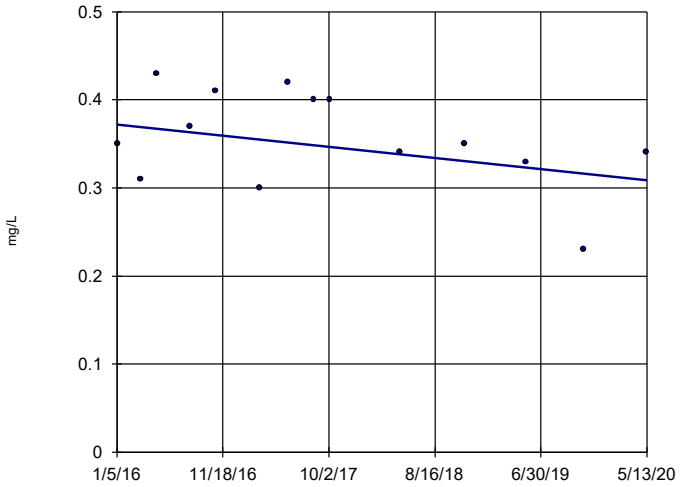
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Fluoride

MW-6A



n = 14

Slope = -0.0145 units per year.

Mann-Kendall statistic = -26
critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

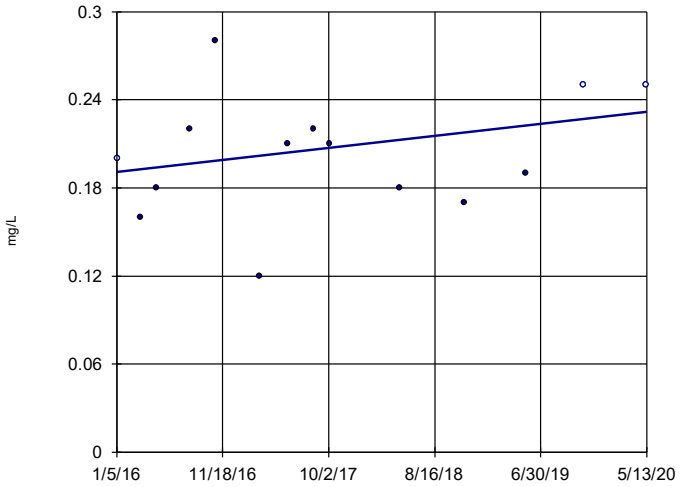
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Fluoride

MW-7 (bg)



n = 14

Slope = 0.009383 units per year.

Mann-Kendall statistic = 17
critical = 44

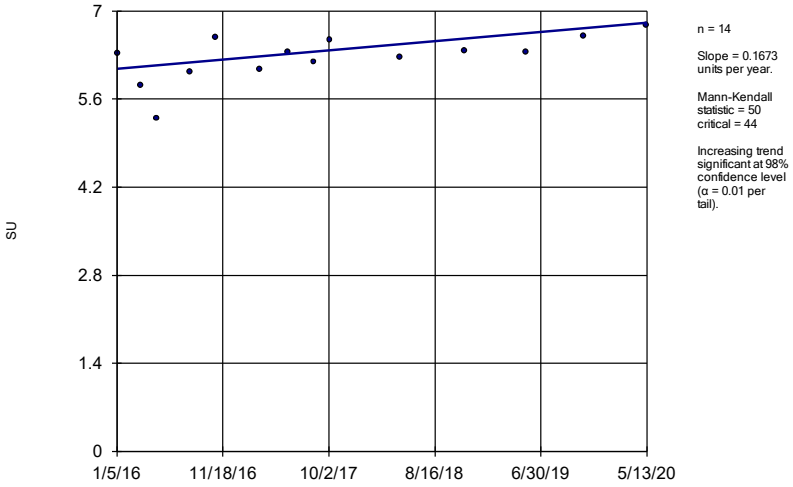
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

pH

MW-2 (bg)



n = 14

Slope = 0.1673 units per year.

Mann-Kendall statistic = 50 critical = 44

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

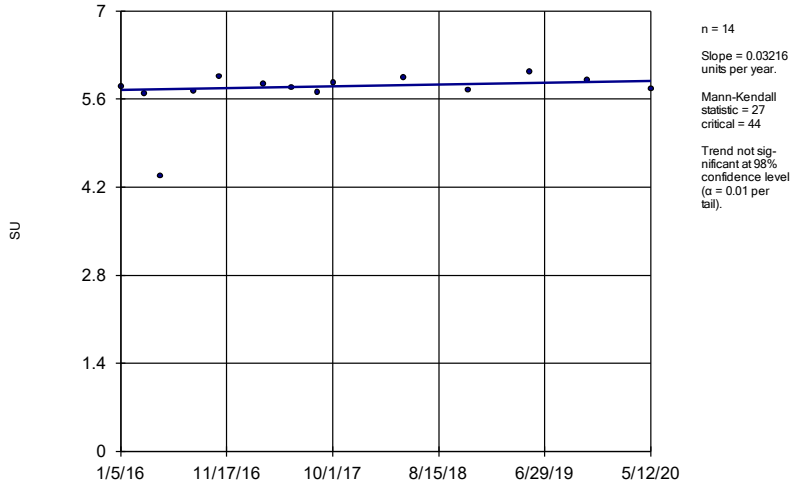
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-3 (bg)



n = 14

Slope = 0.03216 units per year.

Mann-Kendall statistic = 27 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

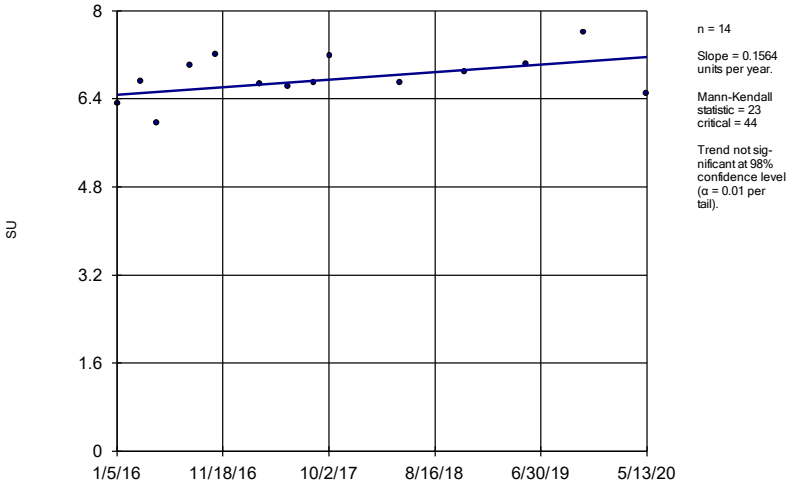
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-4



n = 14

Slope = 0.1564 units per year.

Mann-Kendall statistic = 23 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

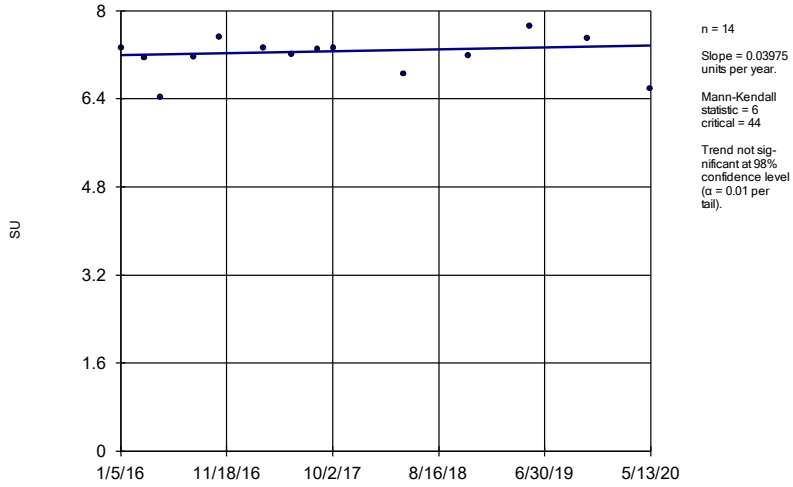
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-5



n = 14

Slope = 0.03975 units per year.

Mann-Kendall statistic = 6 critical = 44

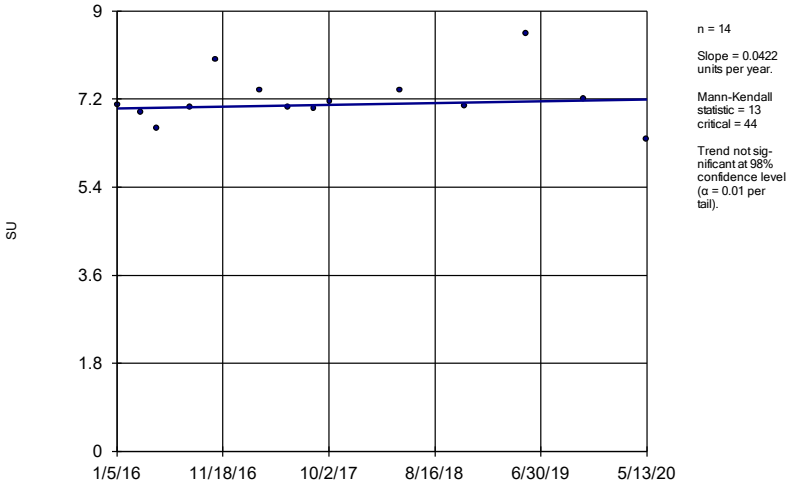
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

pH

MW-5A



n = 14

Slope = 0.0422 units per year.

Mann-Kendall statistic = 13 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

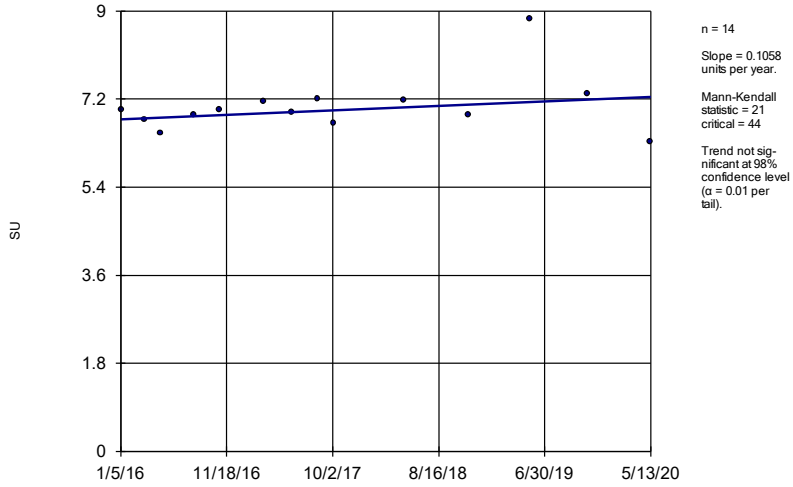
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-6



n = 14

Slope = 0.1058 units per year.

Mann-Kendall statistic = 21 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

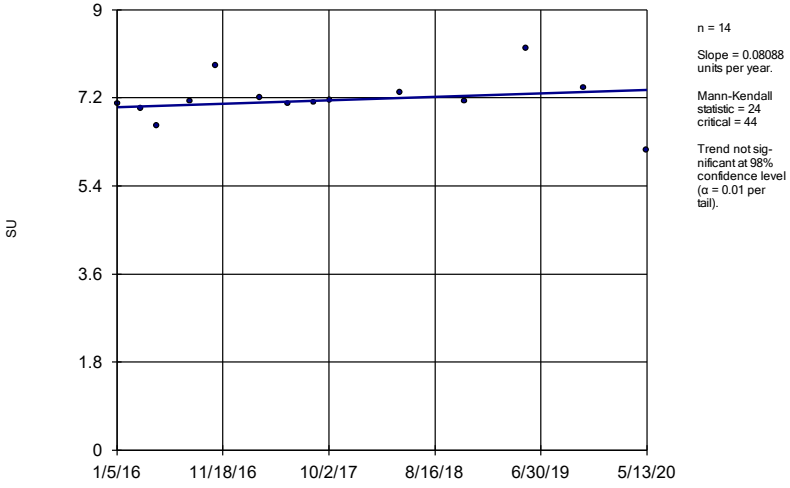
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-6A



n = 14

Slope = 0.08088 units per year.

Mann-Kendall statistic = 24 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

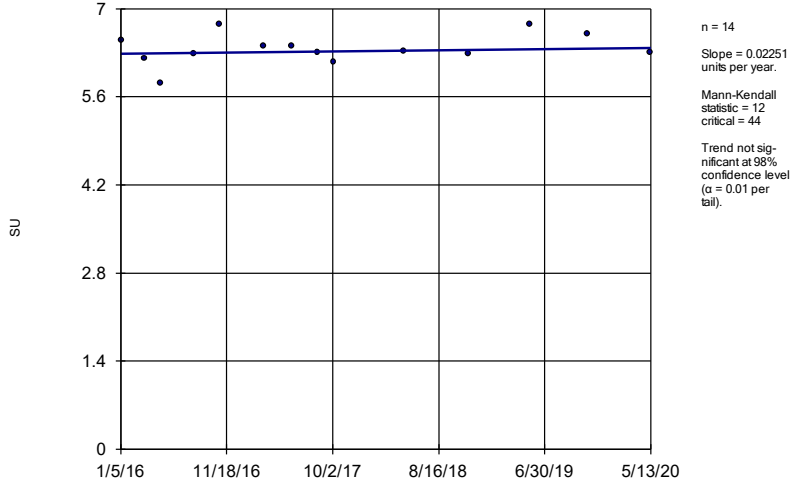
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-7 (bg)



n = 14

Slope = 0.02251 units per year.

Mann-Kendall statistic = 12 critical = 44

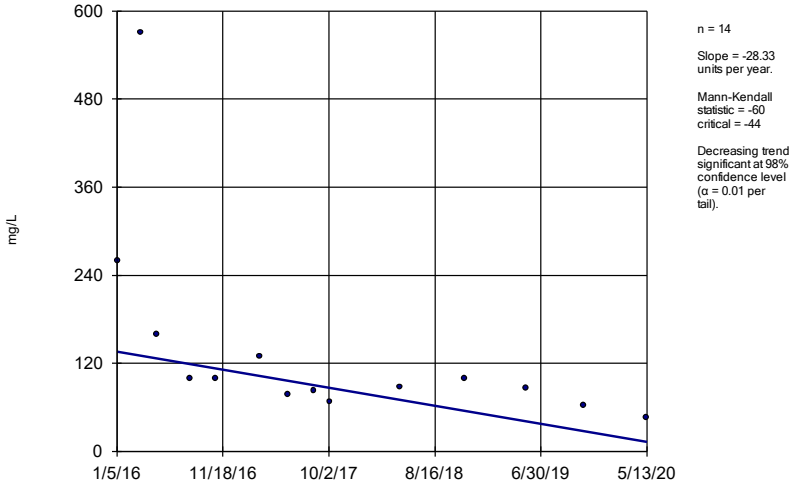
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sulfate

MW-2 (bg)



n = 14

Slope = -28.33 units per year.

Mann-Kendall statistic = -60 critical = -44

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

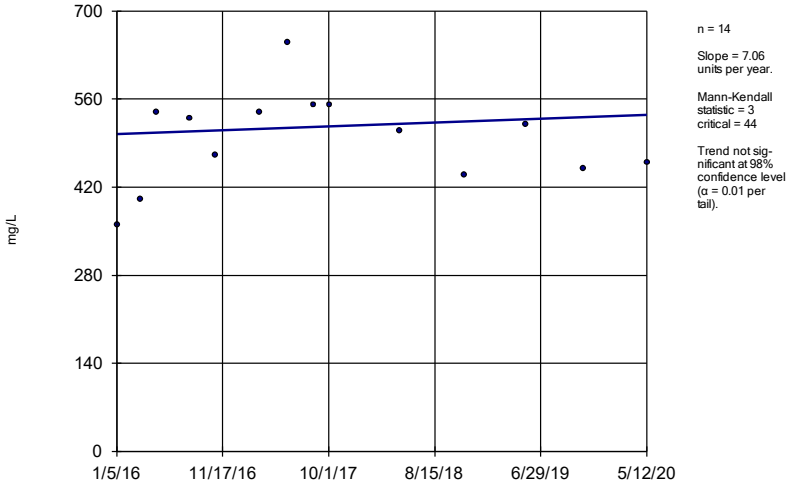
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-3 (bg)



n = 14

Slope = 7.06 units per year.

Mann-Kendall statistic = 3 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

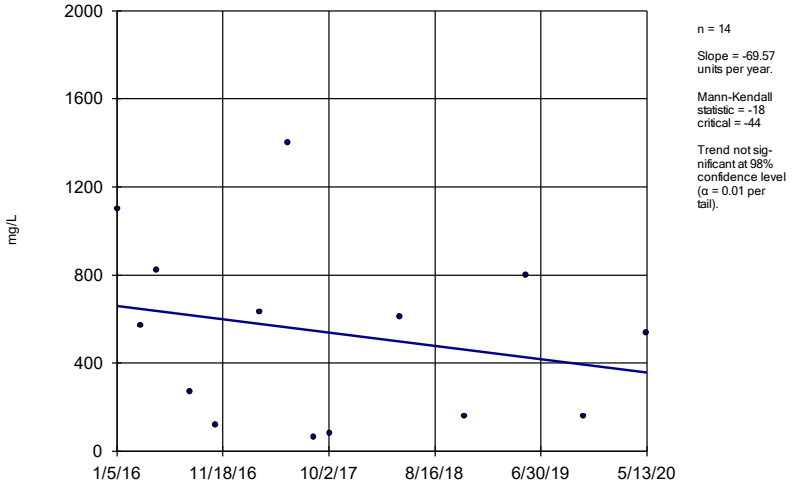
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-4



n = 14

Slope = -69.57 units per year.

Mann-Kendall statistic = -18 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

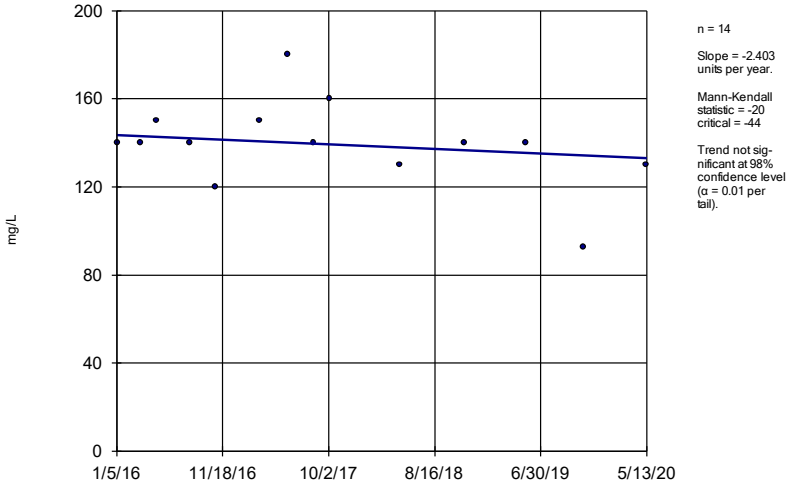
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-5



n = 14

Slope = -2.403 units per year.

Mann-Kendall statistic = -20 critical = -44

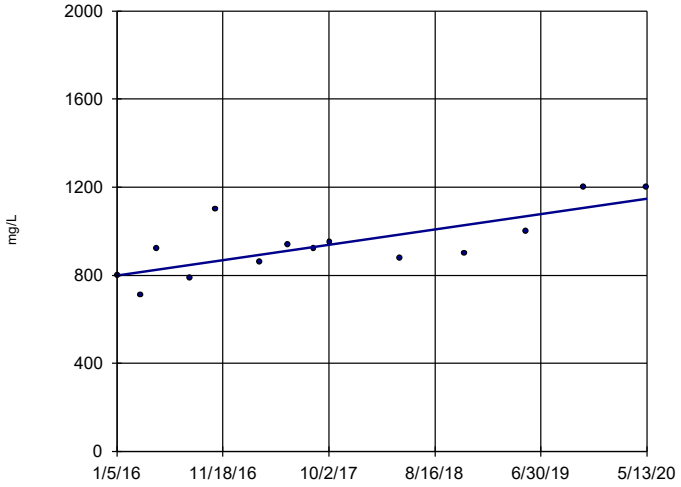
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sulfate

MW-5A



n = 14

Slope = 79.76 units per year.

Mann-Kendall statistic = 49
critical = 44

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

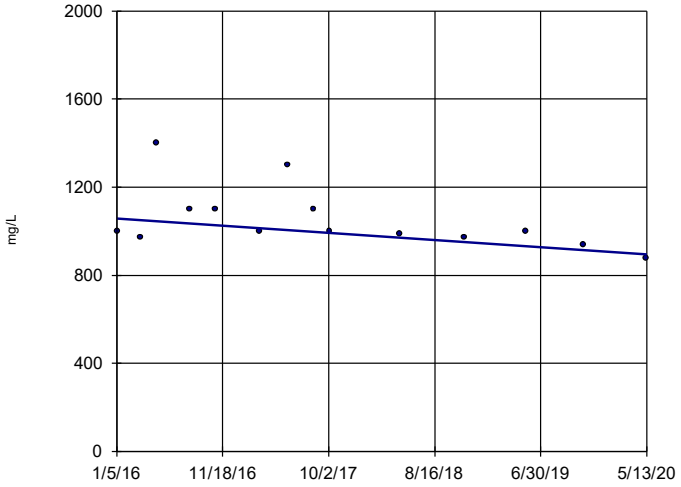
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6



n = 14

Slope = -37.24 units per year.

Mann-Kendall statistic = -41
critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

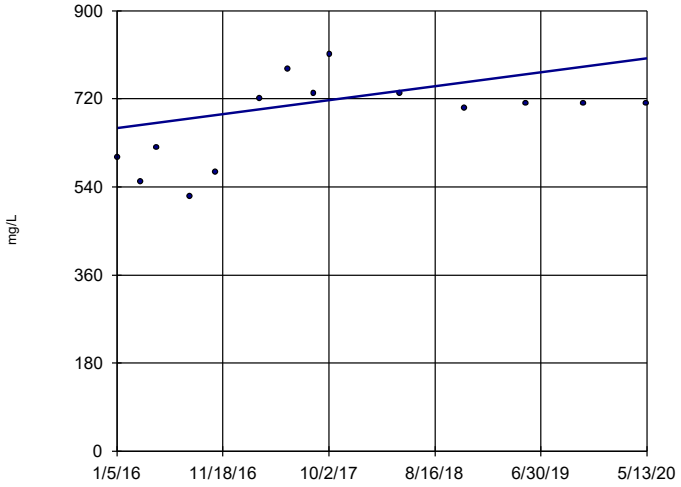
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6A



n = 14

Slope = 32.75 units per year.

Mann-Kendall statistic = 29
critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

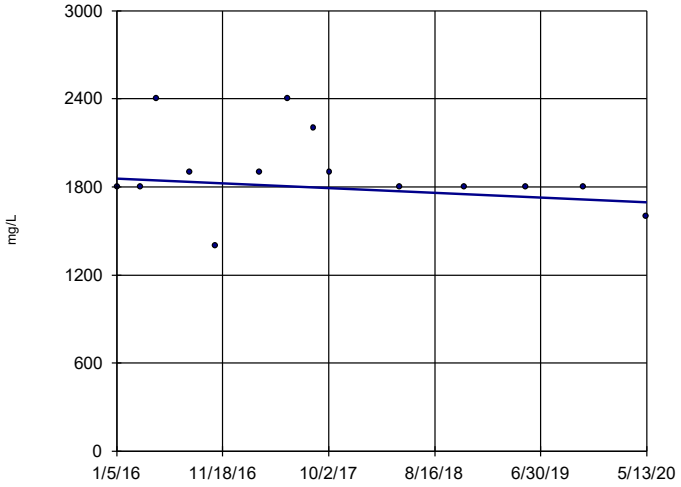
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-7 (bg)



n = 14

Slope = -36.25 units per year.

Mann-Kendall statistic = -22
critical = -44

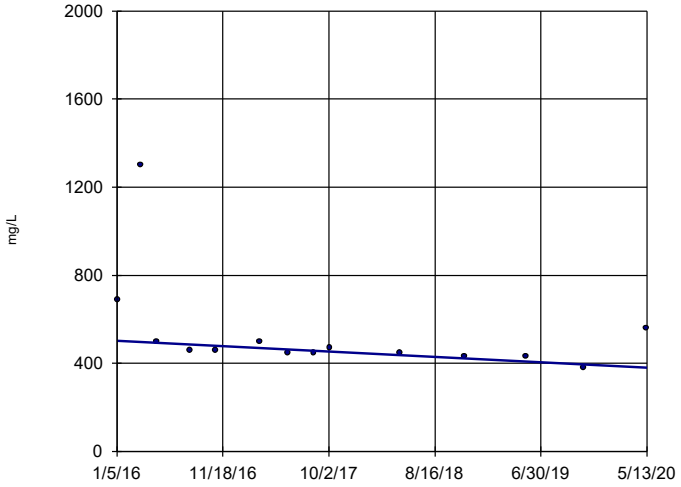
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Total Dissolved Solids

MW-2 (bg)



n = 14

Slope = -27.65 units per year.

Mann-Kendall statistic = -49 critical = -44

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

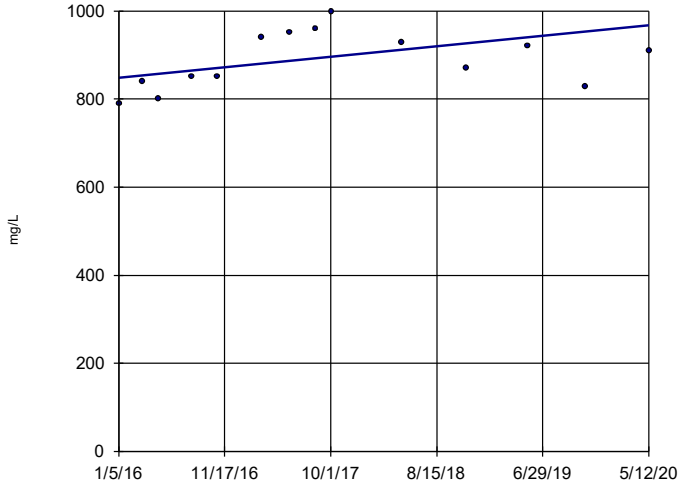
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-3 (bg)



n = 14

Slope = 27.35 units per year.

Mann-Kendall statistic = 28 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

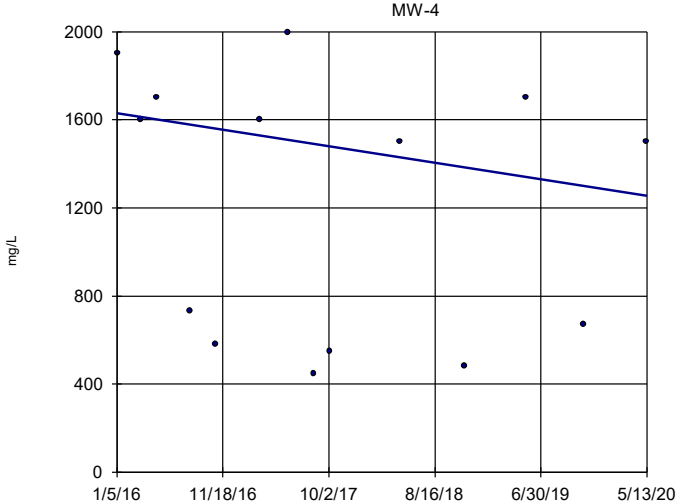
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-4



n = 14

Slope = -86.49 units per year.

Mann-Kendall statistic = -22 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

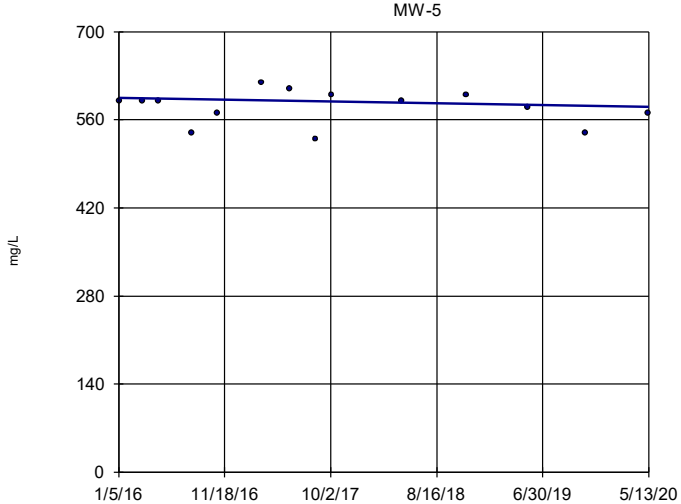
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-5



n = 14

Slope = -3.303 units per year.

Mann-Kendall statistic = -14 critical = -44

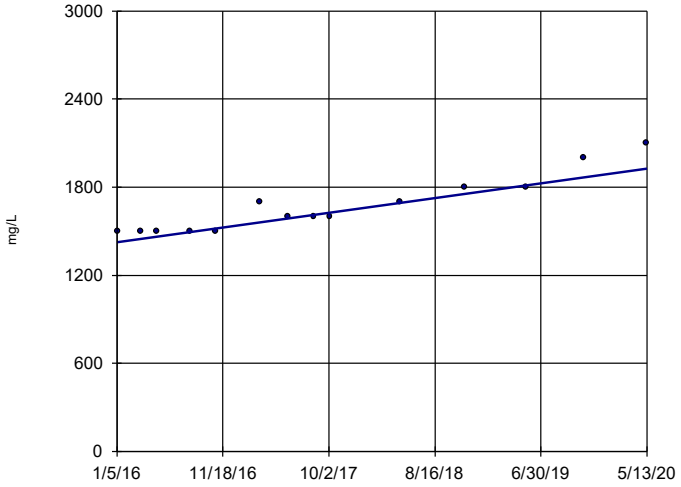
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Total Dissolved Solids

MW-5A



n = 14

Slope = 114.8 units per year.

Mann-Kendall statistic = 70 critical = 44

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

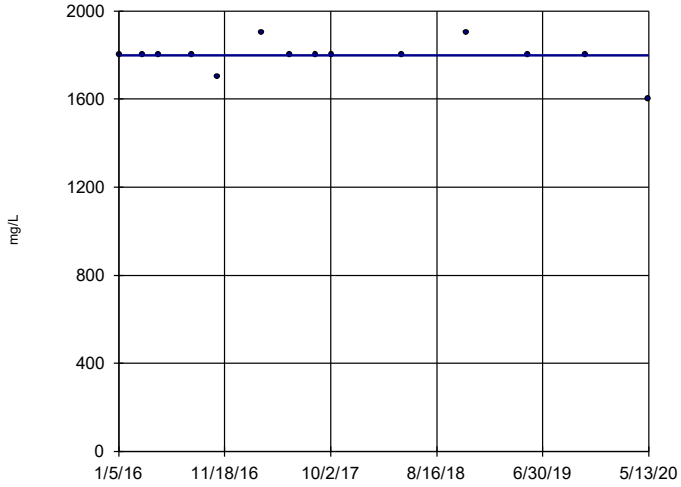
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-6



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = -5 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

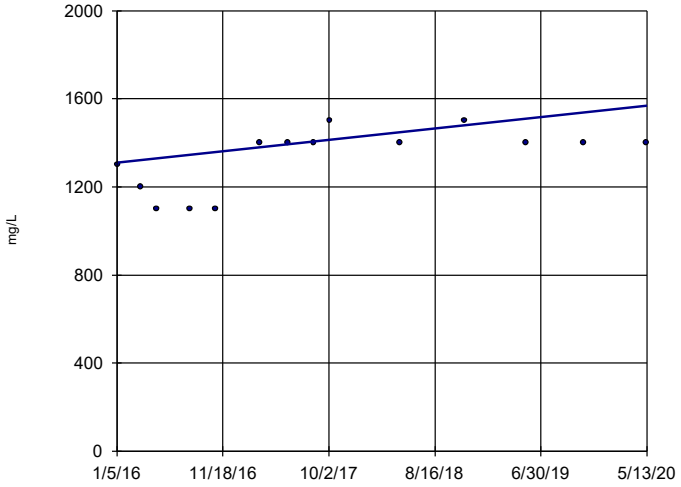
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-6A



n = 14

Slope = 59.16 units per year.

Mann-Kendall statistic = 38 critical = 44

Trend not significant at 98% confidence level (α = 0.01 per tail).

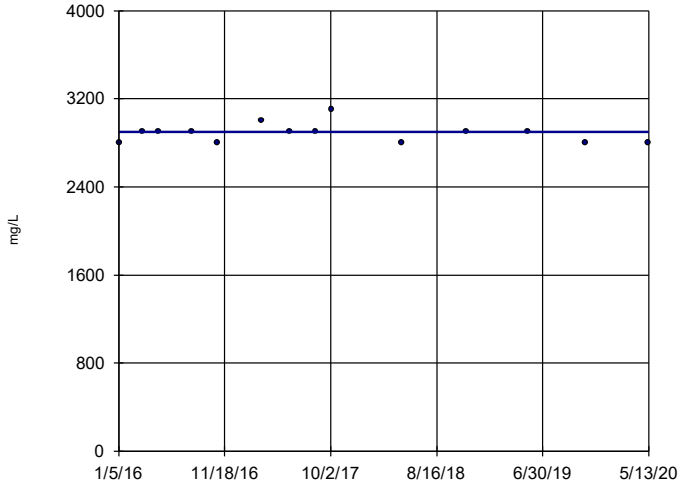
Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.25 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-7 (bg)



n = 14

Slope = 0 units per year.

Mann-Kendall statistic = -8 critical = -44

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 6/3/2020 3:00 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background Printed 6/3/2020, 3:10 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	**MW-2 (bg)**	**-0.04017**	**-55**	**-44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	MW-3 (bg)	0	20	44	No	14	57.14	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4	0	19	44	No	14	71.43	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5	0	-5	-44	No	14	7.143	n/a	n/a	0.02	NP
Boron (mg/L)	**MW-5A**	**0.08349**	**60**	**44**	**Yes**	**14**	**7.143**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	MW-6	0	4	44	No	14	7.143	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6A	0.02744	37	44	No	14	7.143	n/a	n/a	0.02	NP
Boron (mg/L)	MW-7 (bg)	-0.00...	-25	-44	No	14	7.143	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2 (bg)	-2.479	-33	-44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3 (bg)	3.718	43	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4	-6.813	-6	-44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5	2.679	27	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	**MW-5A**	**11.27**	**47**	**44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Calcium (mg/L)	MW-6	0	-4	-44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6A	9.852	35	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-7 (bg)	-10.95	-19	-44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	**MW-2 (bg)**	**-5.949**	**-54**	**-44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Chloride (mg/L)	MW-3 (bg)	-5.794	-38	-44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4	-6.847	-29	-44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5	0.115	17	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5A	1.237	16	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6	0.6207	37	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	**MW-6A**	**-6.252**	**-57**	**-44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Chloride (mg/L)	MW-7 (bg)	1.398	17	44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2 (bg)	0	-9	-44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3 (bg)	-0.02486	-36	-44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4	0	-1	-44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5	-0.00...	-13	-44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5A	0.03299	40	44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6	0.006186	26	44	No	14	7.143	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6A	-0.0145	-26	-44	No	14	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-7 (bg)	0.009383	17	44	No	14	21.43	n/a	n/a	0.02	NP
pH (SU)	**MW-2 (bg)**	**0.1673**	**50**	**44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
pH (SU)	MW-3 (bg)	0.03216	27	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-4	0.1564	23	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-5	0.03975	6	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-5A	0.0422	13	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-6	0.1058	21	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-6A	0.08088	24	44	No	14	0	n/a	n/a	0.02	NP
pH (SU)	MW-7 (bg)	0.02251	12	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	**MW-2 (bg)**	**-28.33**	**-60**	**-44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Sulfate (mg/L)	MW-3 (bg)	7.06	3	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4	-69.57	-18	-44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5	-2.403	-20	-44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	**MW-5A**	**79.76**	**49**	**44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Sulfate (mg/L)	MW-6	-37.24	-41	-44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6A	32.75	29	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-7 (bg)	-36.25	-22	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	**MW-2 (bg)**	**-27.65**	**-49**	**-44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids (mg/L)	MW-3 (bg)	27.35	28	44	No	14	0	n/a	n/a	0.02	NP

Trend Test

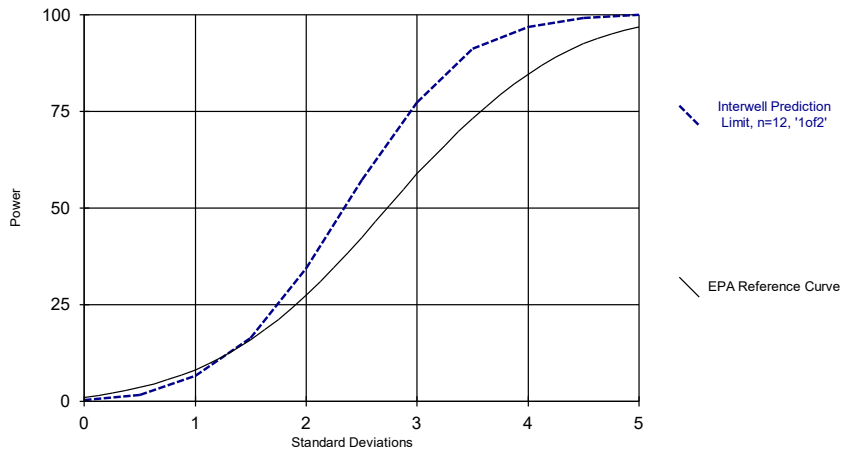
The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background Printed 6/3/2020, 3:10 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Total Dissolved Solids (mg/L)	MW-4	-86.49	-22	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5	-3.303	-14	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	**MW-5A**	**114.8**	**70**	**44**	**Yes**	**14**	**0**	**n/a**	**n/a**	**0.02**	**NP**
Total Dissolved Solids (mg/L)	MW-6	0	-5	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6A	59.16	38	44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-7 (bg)	0	-8	-44	No	14	0	n/a	n/a	0.02	NP

Sanitas™ Output – Sampling Event

Power Curve

Power Curve



Kappa = 2.292, based on 5 compliance wells and 7 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 6/3/2020 3:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 5-20 App 3 Asbury ponds with background

APPENDIX B

November 2020 Sampling Event

2020 Groundwater Monitoring, Sampling & Statistics Per EPA CCR Rule (CFR § 257.90-.98)

November Sampling Event

Asbury Generating Station CCR Impoundment
Jasper County, MO

January 2021

Prepared For:
The Empire District Electric Company
602 S. Joplin Avenue
Joplin, Missouri 64801

Midwest Environmental CONSULTANTS

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1.0 INTRODUCTION

The EPA Coal Combustion Residual Regulations (40 CFR Part 257) (CCR Rule) require groundwater monitoring of CCR impoundment. This Asbury Generating Station CCR impoundment groundwater monitoring sampling report is in accordance with the EPA CCR Rule.

In accordance with the EPA CCR Rule (§ 257.90-.98) the status of the Groundwater Monitoring was placed on-line October 17, 2017, as required by the EPA CCR rule. On November 2, 2017 the facility received approval from Missouri Department of Natural Resources (MDNR) of their groundwater system (included in **Appendix 1**). Empire notified the MDNR "State Director" via e-mail when this document was posted on-line, as required in the CCR rule.

The EPA CCR Rule requires the annual groundwater report be prepared by January 31st of the following year. The first report was due January 31, 2018. This report was prepared in general accordance with the EPA CCR Rule for groundwater requirements. These regulations outline groundwater monitoring requirements and data evaluation methods. The annual groundwater report for the 2020 sampling events will be posted on-line within 30 days of placement in the operating record.

The purpose of the groundwater monitoring plan is to monitor the ground water quality surrounding the facility and to evaluate potential impacts and/or releases from facility operations. Background groundwater data was collected from January 2016 to August 2017. After the background data plus the first semi-annual sampling events, a reduced sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will generally be completed during the months of May and November. Statistical analysis for EPA Appendix III began after the first semi-annual sampling event was collected on October 4, 2017 to determine if a statistically significant increase (SSI) has occurred. If an SSI is verified, additional evaluation is required to determine if the SSI was caused by the CCR impoundment.

On November 10, 2020, a semi-annual sampling event was conducted per the EPA CCR Rule (§ 257.90-.98). Eight (8) groundwater-monitoring wells were sampled and analyzed for the EPA Appendix III. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. For quality assurance and quality control measures, a duplicate sample at MW-5 was taken. These samples were preserved and submitted directly to the laboratory.

This report is a summary of the November 2020 sampling event and the findings of the statistical analysis of the results of the groundwater monitoring program at the Asbury Generating Station CCR Impoundment. Specific information of each sampling event can be obtained from the individual report which is part of the Asbury Operating Record.

2.0 SITE LOCATION

The site occupies the north half of Section 17, Township 30 North, and Range 33 West on the Asbury 7.5-Minute Quadrangle Map as seen in **Figure 1**. The site is located approximately 5.5 miles north-northeast of Asbury, Missouri, about 14 miles north-northwest of Joplin, Missouri. A map showing the locations of the monitoring wells is on **Figure 2**.

2.1 History

In March 1996, five (5) groundwater monitoring wells, MW-1 through MW-5, were installed around the perimeter of the Asbury Generating Station CCR impoundment. Monitoring wells MW-1, MW-2 and MW-3 were installed to a total depth of between 27.0 to 28.5 feet below ground surface (bgs). Monitoring wells MW-4 and MW-5 were installed to a total depth of 48 feet bgs. Each of the five monitoring wells was equipped with 10.0-foot well screens. The five wells were then developed, purged, and sampled in 1996.

In 2003, two (2) additional groundwater monitoring wells were installed and identified as MW-6 and MW-7. Both wells had 2-inch diameter PVC well casings installed to an approximate total depth of 44 feet below ground surface. Both wells were installed with an above ground steel protective cover. No other construction details such as well screen lengths were available for these two (2) wells. In December 2015, two (2) additional groundwater monitoring wells were installed and identified as MW-5A and MW-6A.

All wells are registered with MDNR – Missouri Geological Survey Program.

2.2 Site Geology

Drilling and subsurface investigation activities at the Site and as part of the MDNR approved CCR landfill Detailed Site Investigation (DSI) for the adjacent landfill area identified three (3) primary geologic units at the Site. These geologic units include the surficial soil layer, Warner Sandstone (uppermost aquifer), and Riverton Shale (confining unit). The information presented herein includes the primary elements of a site characterization work plan consistent with the MDNR guidance.

Surficial Soil. Soils at the site consist of a surficial unit of cohesive soils (e.g., CL, SC, ML, and CH) underlain by Pennsylvanian-age bedrock. Soil thickness at the Site ranges from approximately 15-25 feet.

Warner Sandstone. The Warner Sandstone (Sandstone) is the uppermost bedrock unit in south portion of the Site. In the north area of the Site, the Sandstone is overlain by the Riverton Shale (Shale). Based on the DSI information, the Sandstone and Shale can occur as alternating layers. The Sandstone and Shale are gradational in places and transition from shaley sandstone to sandy shale. According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Warner Sandstone formation is described as follows: “Generally, the lower part is interbedded, very fine grained sandstone and claystone. The upper part is largely medium-bedded to massive channel fill sandstone. In places, the Warner consists primarily of shale and claystone, with only minor amounts of sandstone” and “ranges in thickness from 0 to 15m (49.2 ft.).”

The Sandstone is more than 25-30 feet thick in places and is generally medium hard and thin to medium bedded with occasional shale partings. The degree of induration of the Sandstone varies and generally increases with depth. Slug tests performed at selected DSI piezometers screened in

the Sandstone exhibited hydraulic conductivities ranging from approximately 1.3x10-4 cm/sec to 5.9x10-6 cm/sec. The slug test results are consistent with values for sandstone and shaley sandstone. The groundwater gradient is towards the east and Blackberry Creek.

Riverton Shale. Layers of the Riverton Shale (Shale) exhibited thicknesses ranging from approximately one foot to more than 10 feet. The Shale is generally dark gray to light gray. The Shale is mainly thin bedded with hardness ranging from soft to hard. Six packer tests were performed during the DSI to assess the hydraulic conductivity of the Shale. The packer test results ranged from approximately $3.2x10^{-6}$ cm/sec to $4.9x10^{-8}$ cm/sec. The packer test data indicates that the Shale is an effective confining unit.

According to the MDNR publication on the Pennsylvanian Subsystem in Missouri, the Riverton Shale formation is described as "dark gray to black, fine-grained, relatively brittle shale and contains as many as three coal beds, each of which is underlain by underclay" and "varies in thickness from a featheredge to more than 90 feet".

Unnamed Coal. The Shale includes coal seams in places that range in thickness from a few inches to approximately 1.5 feet. The coal is generally black to dark gray.

2.3 Groundwater Monitoring Network Design

The groundwater monitoring system for the CCR impoundment consists of nine (9) groundwater monitoring wells. Two (2) wells are considered upgradient. Two (2) wells are considered sidegradient; one is only monitored for groundwater elevation. The remaining five (5) wells are considered downgradient.

The groundwater monitoring wells (MWs) at the Asbury Generating Station are equipped with individual dedicated poly tubing to be connected to a peristaltic pump/controller at the surface. Low-flow, micro-purge and sampling techniques and technology are utilized to collect groundwater samples from the subject wells. The groundwater sampling procedures are discussed in further detail below.

2.4 Groundwater Monitoring Network

The locations of the monitoring wells are shown on **Figure 2**. The groundwater monitoring system for the site consists of the following monitoring wells:

- MW-1 Sidegradient (water level only)
- MW-2 Upgradient
- MW-3 Upgradient
- MW-4 Downgradient
- MW-5 Downgradient
- MW-5A Downgradient
- MW-6 Downgradient
- MW-6A Downgradient
- MW-7 Sidegradient

2.5 Seasonal Variation

Historical groundwater elevation data has been limited. However, adequate lengths of well screen have been utilized during the construction of the wells to accommodate typical seasonal groundwater elevation variations seen in southwest Missouri.

2.6 Groundwater Flow Direction

Historically, the seasonally high potentiometric surface indicated the groundwater flow direction to the east. **Figure 3** is a potentiometric map for this May 2018 sampling event.

Originally MW-7 was thought to be a downgradient well but review of the potentiometric mapping from the eight background sampling events revealed that the well is actually a sidegradient well. Therefore, the designation for MW-7 has been changed from a downgradient to a sidegradient well for compliance monitoring.

3.0 BASELINE GROUNDWATER DATA

3.1 Baseline Data Collection

Per EPA CCR Rule § 257.94(b), the site initiated the detection monitoring program in January 2016 to include obtaining a minimum of eight (8) independent samples for each background and downgradient well. The eight (8) independent groundwater samples were obtained and analyzed as required by the CCR Rule under per the baseline groundwater monitoring plan. Background groundwater data was collected from January 2016 to August 2017.

Groundwater Monitoring Reports were completed for each sampling event and have been placed in the Operating Record. Summary tables of the results from each event are included in **Appendix 2**. A listing of each event is below:

- January 2016
- March 2016
- May 2016
- August 2016
- October 2016
- March 2017
- June 2017
- August 2017

Initial baseline monitoring was required at all monitoring wells. The sampling frequency was quarterly or more frequently for the first two (2) years. After the background data plus the first semi-annual sampling events, a reduced lower sampling frequency replaced the quarterly events to semi-annual events. This lessened sampling frequency will be completed during the months of May and October.

The initial two (2) years of baseline and the first semi-annual detection monitoring included parameters listed in Appendix III and Appendix IV of the EPA CCR Rule. The constituents listed in Appendix IV were eliminated from the overall semi-annual detection monitoring plan after review of the first semi-annual groundwater sampling event analytical results in January 2018, according to the EPA CCR Rule. **Appendix 2** contains the list of constituents.

3.2 Background Data Analysis

Sanitas™ for Ground Water Version 9.2.13 was used to run the statistical analyses with settings used as recommended by the Sanitas™ training course and user manual. The background data consisted of eight sampling events between January 2016 and August 2017 for both the Appendix III and IV constituents. Eight background events are needed for statistical analysis. An analysis of the Appendix III background data was conducted and is included in **Appendix 5**. Trending was found in Boron (MW-3) and Total Dissolved Solids (MW-3). MW-3 is an up-gradient well. Trending was not removed at that time; otherwise the site would be below the minimum of eight background samples needed to run statistics.

Four more sets of background data were available to add to the background data set for the November 2019 sampling event. The analysis of the additional data for the background data set was conducted and is included in **Appendix 5**. No trending was found in the additional four sets of data so they were added to the baseline data set to increase the statistical power of the background data.

4.0 GROUNDWATER SAMPLING EVENT

On November 10, 2020, eight (8) groundwater monitoring wells were sampled by Midwest Environmental Consultants (MEC) for the EPA CCR Rule Appendix III parameters. For quality assurance and quality control measures, a duplicate sample was taken at MW-5. The sampling protocol and methodology was to be conducted in accordance to the facility's Sampling and Analysis Plan. **Table 1** provides a list of the analytical methods employed by the subcontracted laboratory.

Table 1 – Analytical Methods	
Method	**Description**
9056A	Anions, Ion Chromatography
6020A	Metals (ICP/MS)
SM 2540C	Solids, Total Dissolved (TDS)
Field Sampling	Field Sampling

Appendix 3 includes Monitoring Well Field Inspection sheets and field notes. The physical integrity of the wells was good. During sample collection each of the wells was monitored for pump discharge and formation recharge. Initially, a static water level for each well was recorded (**Table 2**). To ensure sufficient recharge while sampling, static water levels were collected during pumping. Prior to sample collection, field parameters for each well were measured with a flow-through meter. When the field parameters stabilized, samples for analytical testing were collected and placed on ice for hand delivery to the laboratory. At the conclusion of sample collection from each well, a final static water level measurement was obtained. The samples were collected in the appropriately pre-preserved sample containers and placed on ice for delivery.

Table 2 - Groundwater Sampling Field Parameters Summary During November 2020 Sampling Event				
WELL ID	**STATIC WATER LEVEL (ft-BTOC)**		**PURGE RATE (mL/min)**	**STABILIZED pH**
	Initial	**Final**		
MW-1*	NT	NA	NA	NA
MW-2	1.62	3.95	200	6.51
MW-3	1.72	1.76	200	5.68
MW-4	6.01	11.46	200	6.80
MW-5	0.00	5.53	200	7.60
MW-5A	9.42	15.02	200	6.72
MW-6	9.20	14.07	200	6.96
MW-6A	8.41	13.48	200	7.09
MW-7	5.03	5.20	200	6.81

* Water Level Only NA – Not Applicable NT – Not Tested (inaccessible)

Appendix 4 includes the initial analytical results for the sampling event. Included with this analytical report are sample information; chain of custody; wet chemistry data; and volatile data.

5.0 DATA VALIDATION PROCEDURES FOR GROUNDWATER MONITORING DATA

Midwest Environmental Consultants receives Data Packages from the analytical laboratory (Test America). The internal quality control/quality assurance case narratives and reported data are then reviewed. Generally the data validation procedures established by the U.S. Environmental Protection Agency *Contract Laboratory Program Functional Guidelines for Organic Data Review* and *Functional Guidelines for Inorganic Data Review* is followed. These guidelines are used to assign data qualifiers to the data. A formal data validation report for the site is not prepared; however, any significant issues are noted in the groundwater monitoring report.

MEC evaluates the data set for precision, accuracy, representativeness, comparability, and completeness (PARCC).

5.1 Precision

Laboratory Precision. Laboratory quality control procedures to measure precision consist of laboratory control sample (LCS) analysis and analysis of matrix spike/matrix spike duplicates (MS/MSD). These analyses are used to define analytical variability.

Field Precision. Analyses of duplicate samples are used to define the total variability (replicability) of the sampling/analytical system as a whole. Field replicates are collected at a rate of one per sampling event.

5.2 Accuracy

Accuracy is determined by calculating the percent recoveries for analyses of surrogate compounds, LCSs, continuing calibration check standards, and matrix spike samples. Acceptable percent recoveries are established for SW-846 and EPA methods. Field and laboratory blank analysis are also used to address measurement bias.

Field Blanks. Field blanks consisted of a trip blank and a field blank. One trip blank per cooler accompanies samples for volatile organic analyses.

Laboratory Blanks. Method blanks, artificial, matrix-less samples, are analyzed to monitor the laboratory analysis system for interferences and contamination from glassware, reagents, etc. Method blanks are taken through the entire sample preparation process. They are included with each batch of extractions or digestions prepared, or with each 20 samples, whichever is more frequent.

5.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely reflect site condition. Representativeness of the data is determined by comparing actual sampling procedures to those delineated in the field sampling plan, comparing results from field replicate samples and reviewing the results of field blanks. Field notes are reviewed as part of our data validation process.

5.4 Comparability

Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. Comparability is ensured by using established and approved sample collection techniques and analytical methods, consistent basis of analysis, consistent reporting units, and analyzing standard reference materials.

5.5 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected under controlled laboratory conditions. Completeness is defined as the valid data percentage of the total tests requested. Valid data are defined as those where the sample arrived at the laboratory intact, properly preserved, in sufficient quantity to perform the requested analyses, and accompanied by a completed chain-of-custody form. Furthermore, the sample must have been analyzed within the specified holding time and in such a manner that analytical QC acceptance criteria were met.

6.0 STATISTICAL ANALYSIS

6.1 Sampling Results

The constituents with results above the laboratory reporting limits are included in **Table 3**. The Test America laboratory analytical results are included in **Appendix 4**.

Table 3 – Constituents Identified Above Laboratory Reporting Limits During November 2020 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.25	1.9	0.32	0.38	0.22
Calcium	mg/L	NA	37	92	230	71	380	240	170	460
Chloride	mg/L	NA	120	62	4.4	6.4	170	13	25	39
Fluoride	mg/L	4.0	0.39	0.14	<0.1J	0.27	<0.1J	0.22	0.3	<0.1J
pH	SU	NA	6.51	5.68	6.8	7.6	6.72	6.96	7.09	6.81
Sulfate	mg/L	NA	56	530	550	160	2300	1200	850	2200
Total Dissolved Solids	mg/L	NA	430	860	1800	510	3200	1700	1500	2800

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

No constituents were detected above the Federal Safe Drinking Water maximum contaminant level (MCL) during the sampling event.

6.2 Statistical Analysis

The November 2019 sampling event report indicated confirmed intrawell prediction limits exceedances. Intrawell prediction limits were utilized per the facility's 2018 Groundwater Statistical Analysis Plan. The Annual Report recommending the site move into assessment monitoring was stamped on January 23, 2020 and submitted to the facility. However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from background wells, which include upgradient and sidegradient wells per EPA Unified Guidance definitions, and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. In order to appropriately characterize the groundwater beneath the site, the statistical methods utilized at the facility consider the following facts as they relate to site:

- Potential differences in geochemical characteristics of the groundwater caused by the differing lithologies in contact with the screened interval from well to well.
- Potential impacts of surface infiltration into the groundwater environment.

Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. Municipal and demolition waste landfills in Missouri typically utilize intrawell prediction limits per MDNR. However, it was noted that the power curve for these

analyses was not considered strong yet. The data set consisted of only 13 sampling events from January 2016 to November 2019. EPA Unified Guidance recommends 20 or more sampling events for background data for intrawell prediction limits. A small data set triggers an SSI when there is even a slight increase in concentration. Sanitas also note to each exceedance "*Insufficient data to test for seasonality: data were not deseasonalized.*" Minor increases in concentration noted in the May and November 2019 sampling events did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

The EPA Unified Guidance Chapter 5.2.3 states "*In groundwater data collection and testing, background conditions may not be static over time. Caution should be observed in removing observations which may signal a change in natural groundwater quality. Even when conditions have not changed, an apparently extreme measurement may represent nothing more than a portion of the background distribution that has yet to be observed. This is particularly true if the background data set contains fewer than 20 samples.*" Chapter 5.2.4 states "*With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples*". Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated.

MDNR made several requests per EPA in the correspondence located in **Appendix 1** which included the EPA review of the groundwater reports as seen in **Table 4**.

Table 4 – EPA Review of Groundwater Reports	
Facility	Asbury Power Plant
Location	Asbury, MO
Owner	Empire District Electric Company
Units	Upper Pond-unlined, South Pond-unlined, Lower Pond-unlined
Geology	Surficial unit of clay, clayey sand, and silt approximately 15 to 25 feet thick underlain by Warner Sandstone approximately 25-30 feet thick in the southern portion of the site and the Riverton Shale in the northern area of the site
Problematic Use of Intra Well Comparisons	Analytical results indicate consistent differences in contaminant concentrations between upgradient and downgradient wells. Consequently, interwell comparisons are feasible and would be preferable in the absence of compelling reasons to use intra well analysis
Problematic Alternate Source Determination	
Conclusions	While there are no boring logs in the documents to confirm that the wells are screened in the same geologic unit, consistency in the field parameters and the description of the geology suggest that the wells are screened in the sandstone. The analytical results indicate consistent differences in contaminant concentrations between upgradient and downgradient wells, consequently, interwell comparisons are feasible and would be preferable in the absence of compelling reasons to use intra wells analyses

Sanitas™ for Ground Water Version 9.6.25 was used to run the statistical analyses with settings used as recommended by the Sanitas™ training course and user manual. Interwell prediction intervals were run per EPA's request. The Sanitas™ output is included in **Appendix 5**.

Statistical analysis was performed on the Appendix III constituents from the November 2020 sampling event compared to the updated background dataset. Prediction interval analyses compare one or more observations to a limit set by background data. Interwell analyses compare observations from upgradient background wells and their relation to the observations for the downgradient wells. Intrawell analyses compare background observations to current observations of the same well. Due to varying geology in the state of Missouri, intrawell analyses had initially been deemed a more appropriate method. However, EPA has requested the site utilize interwell prediction limits.

Statistical analysis results are presented below for those constituents determined to have an exceeded a prediction limit. However, EPA's "*Unified Guidance Document: Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*," March 2009, EPA 530/R-09-007 is referenced multiple times in the preamble of the EPA CCR regulations for groundwater sampling and analysis requirements. According to the EPA Unified Guidance, a prediction limit exceedance is not considered a statistically significant increase (SSI) until it is confirmed through retesting. SSIs generated by non-detectable results or with less than eight background events are considered statistically invalid.

Table 5 lists the parameters with exceedances of prediction limits during the November 2020 sampling event, the associated monitoring wells, if the exceedance is initial versus confirmed, the predicted limit, the measured concentration, and the MCL set forth in the National Drinking Water Regulations. The MCL is the highest level of a contaminant that is allowed in drinking water.

Table 5 – Interwell Prediction Limit Exceedances Observed During November 2020 Sampling Event

Constituent	Monitoring Well	Initial vs. Confirmed	Predicted Limit	Measured Concentration	Drinking Water MCLs
Boron (mg/L)	MW-5A	Confirmed	0.4147	1.9	NA/4.0 GWPS*
pH (SU)	MW-5	Initial	6.88	7.6	NA
pH (SU)	MW-6	Initial	6.88	6.96	NA
pH (SU)	MW-6A	Initial	6.88	7.09	NA
Total Dissolved Solids (mg/L)	MW-5A	Initial	3100	3200	NA

NA = Not Applicable *EPA proposed groundwater protection standard

6.3 Results Interpretation

The results of the EPA requested interwell prediction limit statistical analysis of the November 2020 sampling event indicate a confirmed exceedance for Boron (MW-5A). Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but the results were below that limit. The facility will conduct an alternative source demonstration in the next 90 days per the EPA CCR Rule (§ 257.94).

The results for pH (MW-5, MW-6 and MW-6A) and total dissolved solids (MW-5A) indicated initial interwell prediction limit exceedances for the listed monitoring well during November 2020 sampling event. There are no current primary (health based) MCLs for pH or total dissolved solids. The facility plans to resample as part of the May 2021 sampling event.

During the May 2020 sampling event, Initial interwell prediction exceedances in boron (MW-5A and MW-6A) and fluoride (MW-5A) were noted. However, the initial prediction limit exceedances of boron (MW-6A) and fluoride (MW-5A) were not confirmed during the November 2020 sampling event.

Below is a discussion of the previous results for comparison.

May 2020

The results of the EPA requested interwell prediction limit statistical analysis of the May 2020 sampling event indicate that the site is in compliance. The results for boron (MW-5A and MW-6A) and fluoride (MW-5A) indicated an initial interwell prediction limit exceedance for the listed monitoring well during May 2020 sampling event. There is a current primary (health based) MCL for fluoride of 4.0 mg/L but the result is below the limit. Boron does not have a MCL but does have an EPA proposed groundwater protection standard of 4.0 mg/L but all results were below that limit. Trending was found to be significant for boron (MW-5A) but not significant in boron (MW-6A) and fluoride (MW-5A). Boron is also trending upward in MW-2 which is an up-gradient well. The facility plans to resample as part of the November 2020 sampling event.
During the November 2019 sampling event, Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted. However, these initial prediction limit exceedances were not confirmed during the May 2020 sampling event.

November 2019

The result for Chloride (MW-5A), pH (MW-4) and Sulfate (MW-5A) indicated an initial intrawell prediction limit exceedance for the listed monitoring well during the November 2019 sampling event. There is no current primary (health based) MCL for chloride, pH or sulfate.

During the May 2019, the result for Boron (MW-5A) indicated an initial intrawell prediction limit exceedance and Total Dissolved Solids (MW-5A) indicated a confirmed intrawell prediction limit exceedance. There is no current primary (health based) MCL for boron and total dissolved solids. These prediction limit exceedances were confirmed during the November 2019 sampling event. A resample of MW-5A was conducted on December 11, 2019. The results of the resample confirmed the exceedances and the site planned to move into assessment monitoring.

Table 6 – December 2019
Resample Result Comparison

Constituent	Units	MCL	MW-5A	MW-5A Resample
Appendix III				
Boron	mg/L	NA	0.82	1.0
Calcium	mg/L	NA	240	270
Chloride	mg/L	NA	69	82
Fluoride	mg/L	4.0	<0.5J	0.26
pH	SU	NA	7.2	7

Sulfate	mg/L	NA	1200	1300
Total Dissolved Solids	mg/L	NA	2000	2200

However, in February MEC received an email from the facility. MDNR had forwarded EPA correspondence requesting that the site change their statistical evaluation method to interwell prediction limits. EPA CCR Rule 40 CFR § 257.94(e)(2) allows at alternative source demonstration to be completed if the statistically significant increases are result of the statistical evaluation rather than from a release from the facility. **Appendix 1** contains the MDNR/EPA correspondence.

The results of the EPA requested interwell prediction limit statistical analysis of the November 2019 sampling event indicate that the site is in compliance. Initial interwell prediction exceedances in pH (MW-4, MW-5, MW-5A, MW-6 and MW-6A) were noted but have not been confirmed. There is no current primary (health based) Maximum Contamination Level (MCL) for pH. Trending was not found to be significant for pH in any well during the analysis of the background data set.

May 2019

The result for Boron (MW-5A) and pH (MW-3(u), MW-5A, MW-6 and MW-6A) indicated an initial intrawell prediction limit exceedance for the listed monitoring well during the May 2019 sampling event. There is no current primary (health based) MCL boron or pH. The facility plans to resample as part of the November 2019 sampling event.

During the November 2018, the result for Total Dissolved Solids (MW-5A) indicated an initial intrawell prediction limit exceedance. There is no current primary (health based) MCL for total dissolved solids. This initial prediction limit exceedances was confirmed during the May 2019 sampling event. However, it should be noted that the power curve for these analyses is not considered strong. A small data set triggers an SSI when there is even a slight increase in concentration. The EPA Unified Guidance Chapter 5.2.4 states "With such a small background sample, it can be difficult to develop an adequately powerful intrawell prediction level or control chart, even when retesting is employed (Chapter 19). Thus, additional background data will be needed to augment compliance well samples".

Minor increases in concentrations did not result in any primary MCLs to be exceeded by any of the prediction limit exceedances during the sampling event, demonstrating that the groundwater has not been contaminated. It was also noted that higher levels of total dissolved solids were seen in the side-gradient well MW-7 demonstrating that a there was likely not a release from the facility. Therefore, the site will continue with detection monitoring on a semi-annual basis at this time.

November 2018

The result for Total Dissolved Solids (MW-5A) indicated an initial intrawell prediction limit exceedance for the listed monitoring well during the November 2018 sampling event. There is no current primary (health based) MCL for total dissolved solids. The facility plans to resample MW-5A for Total Dissolved Solids as part of the May 2019 sampling event.

During the May 2018, no intrawell prediction limits were exceeded. Therefore, there were no initial prediction limit exceedances to confirm during the November 2018 sampling event.

May 2018

No intrawell prediction limits were exceeded during the May 2018 sampling event.

The October 2017 results for Total Dissolved Solids (MW-7) indicated an exceedance of the predicted limit for the listed monitoring wells. However, this initial prediction limit exceedance was not confirmed during the May 2018 sampling event.

October 2017
The result for Total Dissolved Solids (MW-7) indicated an initial intrawell prediction limit exceedance for the listed monitoring wells during the October 2017 sampling event. However, the result was below the tolerance limit. There is no current primary (health based) MCL for total dissolved solids.

Review of the Total Dissolved Solids in the duplicate sample taken from the same well (MW-7) shows a result of 3,000 mg/L, which would not be an exceedance of the intrawell prediction limit of 3,069 mg/L. Due to the variances between the sample and the duplicate, the site will re-evaluate MW-7 for Total Dissolved Solids during the next sampling event.

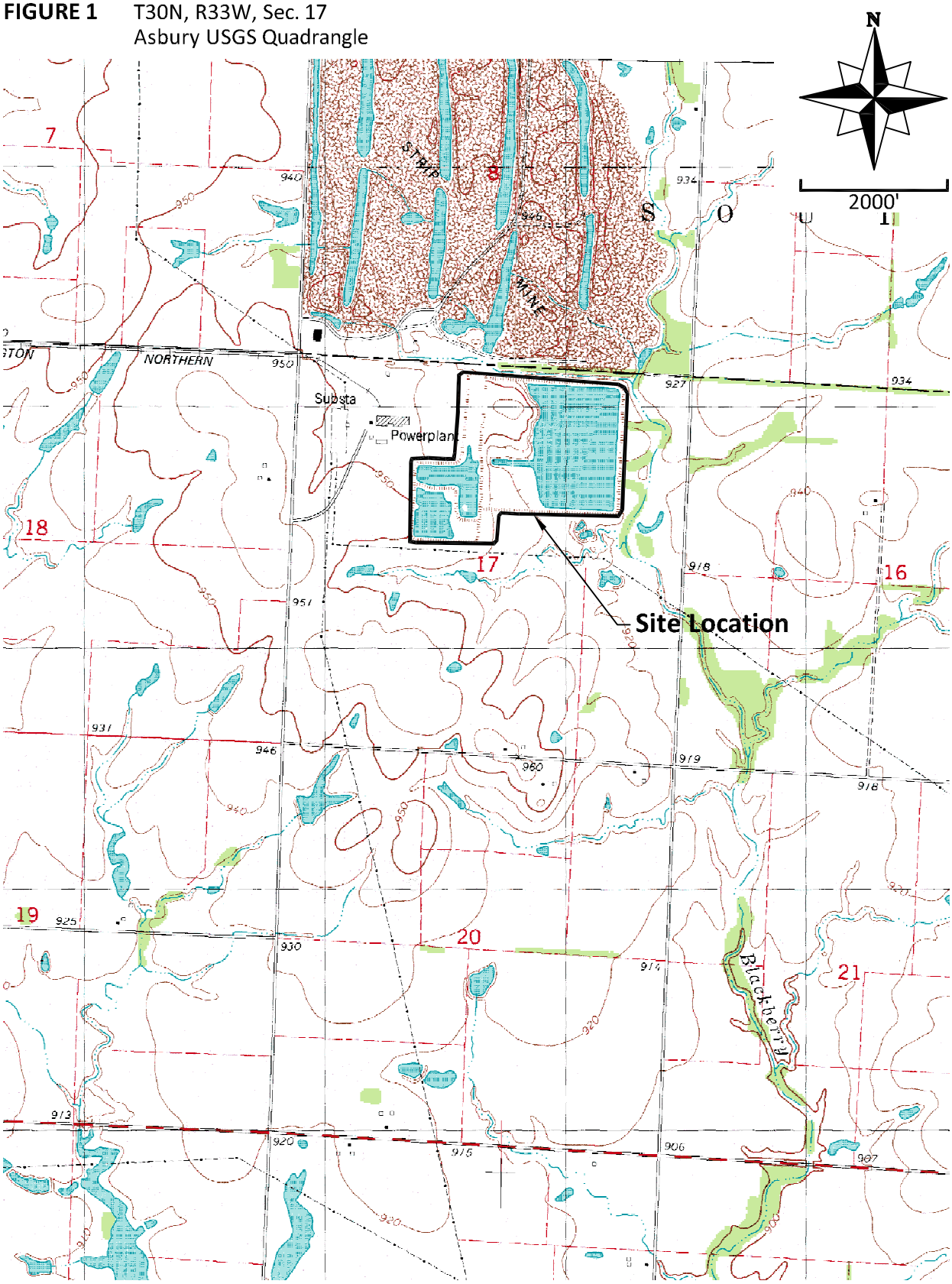
MW-7 is considered a sidegradient well, therefore no further action is needed for exceedances in sidegradient or upgradient wells.

6.4 Proposed Actions
Statistical analysis will continue to be completed with interwell prediction limits per EPA's request. The results of the alternative source demonstration will determine if the site continues with the detection monitoring program on a semi-annual basis or moves into assessment monitoring per the EPA CCR Rule (§ 257.94).

FIGURES

Asbury Generating Station CCR Impoundment
Groundwater Sampling Event - November 2020
Site Location Map

FIGURE 1 T30N, R33W, Sec. 17
Asbury USGS Quadrangle



January 2021

Asbury Generating Station CCR Impoundment
Groundwater Sampling Event - November 2020
Groundwater Monitoring System

FIGURE 2

Well ID	Northing	Easting
MW-1	435791.18 *	2765165.35 *
MW-2	434428.46	2762861.37
MW-3	432842.77	2762720.80
MW-4	433709.99	2764938.99
MW-5	433659.27	2765966.23
MW-5A	434150.04	2765969.78
MW-6	434600.46	2765987.98
MW-6A	435071.44	2766010.46
MW-7	435505.42	2765993.13

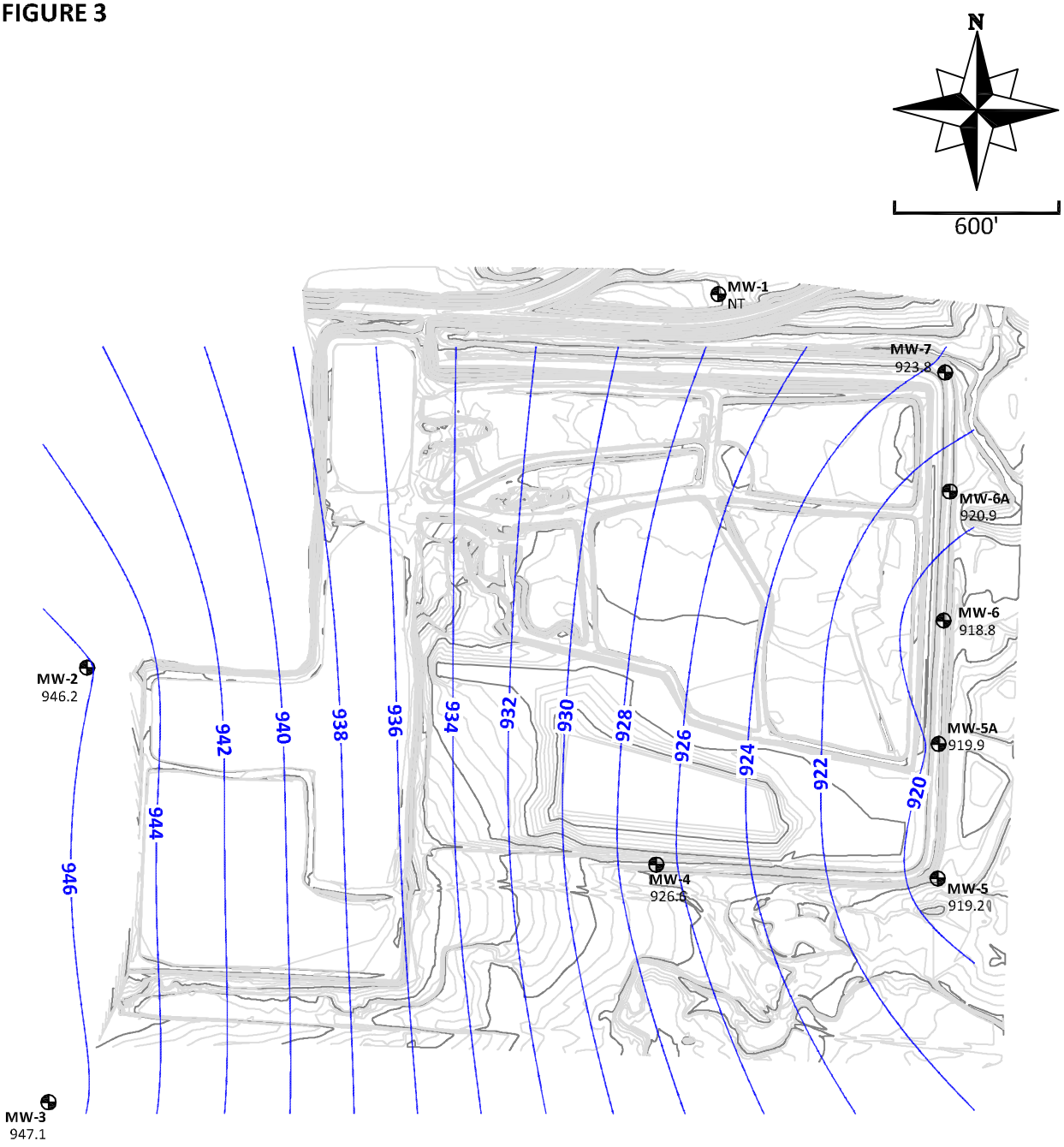
* Coordinate location is approximate

Legend

Monitoring Well

Asbury Generating Station CCR Impoundment
Groundwater Sampling Event - November 2020
Groundwater Piezometric Surface Map

FIGURE 3



Well ID	Northing	Easting	Top Of Casing	Static Water Level (BTOC)	Static Water Level
MW-1	435791.18	2765165.35	933.4	NT	NT
MW-2	434428.46	2762861.37	947.8	1.6	946.2
MW-3	432842.77	2762720.80	948.8	1.7	947.1
MW-4	433709.99	2764938.99	932.6	6.0	926.6
MW-5	433659.27	2765966.23	919.2	0.0	919.2
MW-5A	434150.04	2765969.78	929.3	9.4	919.9
MW-6	434600.46	2765987.98	928.0	9.2	918.8
MW-6A	435071.44	2766010.46	929.3	8.4	920.9
MW-7	435505.42	2765993.13	928.8	5.0	923.8

Legend

Monitoring Well

APPENDIX 1

EPA/MDNR Correspondence

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

NOV 02 2017

Mr. Kavan Stull, Senior Environmental Coordinator
Empire District
602 South Joplin Avenue
Joplin, MO 64802

RE: Site Characterization Workplan

Dear Mr. Stull:

The Missouri Department of Natural Resources has reviewed the document "Site Characterization Workplan" dated May 16, 2017. The site has undergone extensive characterization regarding construction of a coal combustion residual (CCR) landfill near the CCR impoundments. The department's Water Protection Program has determined, through consulting with the Missouri Geological Survey, this characterization is sufficient and may be used in whole to complete the required monitoring of the sub-surface conditions at the site. Additional submittal of site characterization is not necessary, as the previous submittal meets the requirement for special condition 19(b) of the Missouri State Operating Permit MO-0095362. The facility may proceed with the next step laid out in the permit; special condition 19(c). Enclosed is the Missouri Geological Survey concurrence.

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to 10 CSR 20 1.020 and Section 621.250, RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC is by mail at Administrative Hearing Commission, United States Post Office Building, Third Floor, 131 West High Street, P.O. Box 1557, Jefferson City, MO 65102, by phone at 573-751-2422, by fax at 573-751-5018, and by website at www.oa.mo.gov/ahc.

If you have any questions, please do not hesitate to contact Ms. Pam Hackler by mail at Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102-0176, by phone at 573-526-3386; or by email at pam.hackler@dnr.mo.gov. Thank you.

Sincerely,

WATER PROTECTION PROGRAM

Michael J. Abbott, Chief
Operating Permits Section

MJA/php

Enclosure

c: Mr. Randall Willoughby, Southwest Regional Office

Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Eric R. Greitens, Governor
Carol S. Comer, Director

MEMORANDUM

SWR18011
Jasper County

DATE: October 18, 2017

TO: Pam Hackler- WPP- Industrial Wastewater Unit

FROM: Fletcher N. Bone, Geologist, Environmental Geology Section, Geological Survey Program, MGS

Fletcher N. Bone

STATE OF MISSOURI
REGISTERED GEOLOGIST
2014000148
October 18, 2017

SUBJECT: Site characterization for existing CCR impoundments
Asbury Power Plant Site Characterization Work Plan- CCR
37 21 22.66 Latitude, -94 35 4.79 Longitude,
Jasper County, Missouri

The Missouri Geological Survey (MGS) has reviewed the documents titled, 'NPDES Permit MO-0095362 Asbury Power Plant, Jasper County, Missouri, Site Characterization Work Plan', prepared by Empire District Electric Company, dated September 8, 2017 and 'Site Characterization Work Plan, Coal Combustion Residuals Impoundments, Empire Electric Facility - Permit MO-0095362, Jasper County, Missouri, Geotechnology Project No. J021738.03', prepared by Geotechnology Inc., dated May 16, 2017. The MGS offers the following comment.

General Comment:

The MGS agrees that the existing Coal Combustion Residuals (CCR) impoundments (site 1) do not need further site characterization, at this time. The site characterization performed, as described in the Detailed Site Investigation Report (DSI), dated January 21, 2015, at the proposed CCR impoundment (site 2) that is approximately 1,000 feet south of the existing CCR impoundments (site 1), coupled with the geologic and hydrologic data provided that pertains to the existing CCR impoundments (site 1) (1996 to present data), provides adequate characterization of the geology and hydrology of the site 1. The geologic and hydrologic settings of both sites are similar, with geologic boring logs and potentiometric data of both sites being compared. The hydraulic conductivity testing conducted at the proposed CCR site (site 2) has demonstrated that there is a low potential for groundwater contamination for this area.

If you are in need of further assistance from our office or have questions regarding this evaluation please feel free to contact me at (573) 368-2161.

APPENDIX 2

Baseline Sampling Information

EPA CCR Rule

Appendix III to Part 257—Constituents for Detection Monitoring

Boron
Calcium
Chloride
Fluoride
pH
Sulfate
Total Dissolved Solids (TDS)

Appendix IV to Part 257—Constituents for Assessment Monitoring

Antimony
Arsenic
Barium
Beryllium
Cadmium
Chromium
Cobalt
Lead
Lithium
Mercury
Molybdenum
Selenium
Thallium
Radium 226 and 228 combined

1st Baseline Event –
January 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.33	<0.5 J	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J
Calcium	mg/L	NA	57	74	220	84	200	250	140	570
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38
Fluoride	mg/L	4	0.43	0.47	0.31	0.28	0.30	0.24	0.35	<0.2 J
pH	SU	NA	6.33	5.81	6.31	7.33	7.09	6.97	7.09	6.51
Sulfate	mg/L	NA	260	360	1100	140	800	1000	600	1800
Total Dissolved Solids	mg/L	NA	690	790	1900	590	1500	1800	1300	2800
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Arsenic	mg/L	0.01	<0.002 J	0.01	<0.01 J	<0.02 J	<0.01	<0.01	<0.01	<0.01
Barium	mg/L	2	0.044	0.0099	0.065	0.086	0.036	0.02	0.042	0.011
Beryllium	mg/L	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002 J	<0.002 J	<0.01 J	<0.01 J	<0.01 J	<0.01 J	<0.01	<0.01
Cobalt	mg/L	NA	<0.01 J	<0.01 J	0.046	<0.002 J	0.018	0.0022	0.02	0.014
Lead	mg/L	0.015	<0.002 J	<0.002	<0.01 J	<0.002 J	<0.002	<0.002	<0.002	<0.002 J
Lithium	mg/L	NA	0.057	0.15	<0.05 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J	<0.5 J
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002 J	<0.002 J	<0.01 J	<0.002	<0.01 J	<0.002
Selenium	mg/L	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Combined Radium	pCi/L	5	<0.477 J	<0.427 J	<2.08	<0.563 J	<0.392 J	<0.446 J	<0.306 J	<0.279 J

NA = Not Applicable

<x = Less than reporting limit (nondetectable)

J = Trace value seen above minimum detection limit but below reporting limit (trace)

2nd Baseline Event –
March 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.90	0.060	<0.25	0.29	0.29	0.34	0.34	0.29
Calcium	mg/L	NA	120	92	260	94	190	250	160	620
Chloride	mg/L	NA	180	70	15	4.4	23	9.0	36	34
Fluoride	mg/L	4	0.28	0.28	0.10	0.38	0.31	0.23	0.31	0.16
pH	SU	NA	5.82	5.68	6.72	7.15	6.94	6.79	6.98	6.22
Sulfate	mg/L	NA	570	400	570	140	710	970	550	1800
Total Dissolved Solids	mg/L	NA	1300	840	1600	590	1500	1800	1200	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002 J	<0.002	<0.002 J	<0.002
Arsenic	mg/L	0.01	<0.002 J	0.024	0.0038	<0.002 J	0.0038	0.0026	0.0025	0.004
Barium	mg/L	2	0.060	0.012	0.034	0.047	0.042	0.026	0.051	0.0089
Beryllium	mg/L	0.004	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cadmium	mg/L	0.005	0.0028	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002 J	0.0034	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.017	0.0095	0.021	<0.002 J	0.02	0.0061	0.0063	0.016
Lead	mg/L	0.015	<0.002 J	<0.002 J	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002
Lithium	mg/L	NA	0.20	0.15	0.074	0.074	0.14	0.22	0.14	0.30
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.002	<0.002 J	<0.002	<0.002 J	0.0041	<0.002 J	0.0038	<0.002
Selenium	mg/L	0.05	<0.002	<0.002	<0.002	0.0021	0.0028	0.0031	0.0031	<0.002
Thallium	mg/L	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Combined Radium	pCi/L	5	<0.337 J	<0.389 J	<0.84 J	<0.315 J	<0.336 J	<0.319 J	<0.348 J	<0.329 J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

3rd Baseline Event –
May 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.21	0.044	0.027	0.24	0.26	0.25	0.23	0.29
Calcium	mg/L	NA	130	100	91	5	59	11	90	36
Chloride	mg/L	NA	140	83	120	4.7	28	10	38	38
Fluoride	mg/L	4	0.28	0.27	0.22	0.55	0.35	0.26	0.43	0.18
pH	SU	NA	5.30	4.37	5.97	6.43	6.60	6.51	6.64	5.82
Sulfate	mg/L	NA	160	540	820	150	920	1400	620	2400
Total Dissolved Solids	mg/L	NA	500	800	1700	590	1500	1800	1100	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Arsenic	mg/L	0.01	0.0013	0.027	0.01	0.0043	0.01	0.007	0.0037	0.0082
Barium	mg/L	2	0.021	0.01	0.025	0.045	0.037	0.041	0.04	0.021
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002 J	<0.002 J	0.0025	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Cobalt	mg/L	NA	0.0072	0.0073	0.0071	<0.0005J	0.00081	0.0035	<0.0005J	0.0037
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001 J
Lithium	mg/L	NA	<0.05 J	0.15	<0.05 J	0.074	0.16	0.31	0.12	0.22
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0052	<0.005	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005 J	<0.005	<0.005
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	<0.001
Combined Radium	pCi/L	5	<0.355	<0.427 J	<0.386 J	<0.402 J	<0.377 J	<0.357 J	<0.334 J	<0.333 J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

4th Baseline Event –
August 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.19	0.057	0.067	0.27	0.27	0.29	0.27	0.22
Calcium	mg/L	NA	38	79	110	74	180	220	130	430
Chloride	mg/L	NA	120	77	35	6	35	12	65	49
Fluoride	mg/L	4	0.25	0.15	0.3	0.26	0.31	0.23	0.37	0.22
pH	SU	NA	6.04	5.73	7	7.17	7.04	6.88	7.14	6.29
Sulfate	mg/L	NA	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005	<0.005 J	<0.005 J
Total Dissolved Solids	mg/L	NA	460	850	730	540	1500	1800	1100	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Arsenic	mg/L	0.01	<0.001 J	0.013	<0.001 J	<0.001 J	0.001	<0.001 J	<0.001 J	<0.001 J
Barium	mg/L	2	0.023	<0.01 J	0.012	0.035	0.031	0.014	0.037	<0.01 J
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0052	0.0088	0.0038	<0.0005J	0.00075	<0.0005J	<0.0005J	0.015
Lead	mg/L	0.015	<0.001 J	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001	<0.001 J	<0.001
Lithium	mg/L	NA	<0.05 J	0.16	<0.05 J	0.078	0.16	0.22	0.11	0.34
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	<0.005	0.0067	<0.005
Selenium	mg/L	0.05	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005 J	<0.005	<0.005 J	<0.005 J
Thallium	mg/L	0.002	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.424 J	<0.465 J	<0.833	<0.441 J	<0.435 J	<0.45 J	<0.484 J	<0.418 J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

5th Baseline Event –
October 2016 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.2	0.053	0.047	0.24	0.33	0.34	0.31	0.26
Calcium	mg/L	NA	43	91	100	94	220	260	130	490
Chloride	mg/L	NA	130	65	74	6	29	13	65	56
Fluoride	mg/L	4	0.28	0.18	0.28	0.31	0.39	0.25	0.41	0.28
pH	SU	NA	6.59	5.95	7.21	7.51	8.00	6.98	7.85	6.75
Sulfate	mg/L	NA	99	470	120	120	1100	1100	570	1400
Total Dissolved Solids	mg/L	NA	460	850	580	570	1500	1700	1100	2800
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002 J	<0.002
Arsenic	mg/L	0.01	<0.001	0.014	<0.001 J	<0.001 J	<0.001 J	<0.001	<0.001 J	<0.001 J
Barium	mg/L	2	0.028	<0.01 J	0.02	0.03	0.033	0.013	0.037	<0.01 J
Beryllium	mg/L	0.004	<0.001	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002	<0.002 J	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0051	0.0095	0.0013	0.00073	0.0072	<0.0005J	<0.0005J	0.014
Lead	mg/L	0.015	<0.001 J	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05 J	0.17	<0.05	0.078	0.17	0.24	0.12	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005	<0.005	<0.005	<0.005 J	0.0066	<0.005	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005J	<0.005
Thallium	mg/L	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.436J	<0.478J	<0.535J	<0.503J	<0.498J	<0.464J	<0.453J	<0.424J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

6th Baseline Event –
March 2017 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.22	0.052	0.057	0.23	0.29	0.33	0.36	0.26
Calcium	mg/L	NA	38	93	250	86	200	260	170	500
Chloride	mg/L	NA	130	52	19	5.3	29	11	19	39
Fluoride	mg/L	4	0.21	0.12	<0.1 J	0.29	0.29	0.19	0.3	0.12
pH	SU	NA	6.07	5.84	6.67	7.32	7.38	7.15	7.21	6.40
Sulfate	mg/L	NA	130	540	630	150	1100	1000	720	1900
Total Dissolved Solids	mg/L	NA	500	940	1600	620	1700	1900	1400	3000
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	mg/L	0.01	<0.001	0.037	0.0022	0.0013	0.0014	<0.001 J	0.0043	<0.001 J
Barium	mg/L	2	0.021	0.011	0.021	0.033	0.026	0.015	0.027	<0.01 J
Beryllium	mg/L	0.004	<0.001 J	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001 J
Cadmium	mg/L	0.005	0.0012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J	<0.002 J
Cobalt	mg/L	NA	0.0071	0.0097	0.0096	<0.0005J	0.0022	0.0024	0.0017	0.014
Lead	mg/L	0.015	<0.001	<0.001	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05 J	0.17	0.072	0.076	0.16	0.23	0.14	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005 J	<0.005 J	<0.005	<0.005	<0.005 J	<0.005	<0.005 J	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	mg/L	0.002	<0.001 J	<0.001 J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	0.575	1.63	0.287	1.50	0.803	2.68	1.73	1.62

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

7th Baseline Event –
June 2017 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	<0.08J	<0.08J	0.034	0.27	0.31	0.37	0.36	0.26
Calcium	mg/L	NA	42	100	300	89	200	260	160	470
Chloride	mg/L	NA	130	54	110	5.4	23	12	26	48
Fluoride	mg/L	4	0.43	0.19	0.18	0.35	0.42	0.3	0.42	0.21
pH	SU	NA	6.35	5.78	6.62	7.22	7.04	6.93	7.09	6.41
Sulfate	mg/L	NA	78	650	1400	180	940	1300	780	2400
Total Dissolved Solids	mg/L	NA	450	950	2000	610	1600	1800	1400	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic	mg/L	0.01	<0.001J	0.1	0.0032	<0.001J	0.0037	<0.001	0.0018	<0.001
Barium	mg/L	2	0.03	0.016	0.048	0.04	0.026	0.017	0.025	<0.01J
Beryllium	mg/L	0.004	<0.001	0.0031	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002	<0.002	<0.002J	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.004	0.0088	0.0042	<0.0005J	0.0045	0.00087	0.0059	0.0015
Lead	mg/L	0.015	0.0033	0.001	0.0074	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05J	0.18	0.053	0.085	0.18	0.25	0.15	0.34
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005	<0.005J	<0.005	<0.005J	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	mg/L	0.002	<0.001	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.397J	<0.337J	<0.403	<0.291J	<0.343J	<0.414J	<0.33J	<0.314J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

8th Baseline Event –
August 2017 Sampling Event

Constituent	Units	MCL	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6	MW-6A	MW-7
Appendix III										
Boron	mg/L	NA	0.16	<0.08J	<0.08J	0.28	0.33	0.34	0.38	0.27
Calcium	mg/L	NA	43	98	83	57	220	250	180	510
Chloride	mg/L	NA	130	45	8.1	5.3	23	12	26	38
Fluoride	mg/L	4	0.26	0.17	0.32	0.27	0.45	0.25	0.4	0.22
pH	SU	NA	6.2	5.7	6.7	7.3	7.0	7.2	7.1	6.3
Sulfate	mg/L	NA	82	550	63	140	920	1100	730	2200
Total Dissolved Solids	mg/L	NA	450	960	450	530	1600	1800	1400	2900
Appendix IV										
Antimony	mg/L	0.006	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002J	<0.002
Arsenic	mg/L	0.01	<0.001J	0.013	<0.001J	0.002	<0.001J	<0.001J	<0.001J	<0.001J
Barium	mg/L	2	0.024	0.01	0.018	0.027	0.023	0.018	0.021	<0.01J
Beryllium	mg/L	0.004	<0.001	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001J
Cadmium	mg/L	0.005	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chromium	mg/L	0.1	<0.002J	<0.002	0.0026	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L	NA	0.0036	0.01	0.00067	<0.0005J	0.0023	<0.0005J	0.0051	0.014
Lead	mg/L	0.015	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Lithium	mg/L	NA	<0.05J	0.17	<0.05J	0.073	0.18	0.22	0.15	0.32
Mercury	mg/L	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	NA	<0.005	<0.005J	<0.005	<0.005J	<0.005J	<0.005J	<0.005J	<0.005
Selenium	mg/L	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thallium	mg/L	0.002	<0.001J	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Radium	pCi/L	5	<0.42J	<0.417J	<0.473	<0.476J	<0.383J	<0.389J	<0.291J	<0.346J

NA = Not Applicable
<x = Less than reporting limit (nondetectable)
J = Trace value seen above minimum detection limit but below reporting limit (trace)

APPENDIX 3

Monitoring Well Field Inspection Sheets and Field Notes

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 2

Sample X Blind Duplicate ☐ Field Blank ☐.

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2200 mL post pump calibration.

Date / Time Initiated: 11 – 10 -20 @ 4:30 Date / Time Completed: 11 – 10 -20 @

Well Purged To Dryness?: Y / N 0 Petroleum or Gas Detected? Y / N 0

Purge Data: 50 ml/min

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
4:34	200	800	15.92	7.06	685	3.14	33.6		C
:36		1200	16.75	6.76	675	2.19	39.5		
:38		1600	16.09	6.59	676	1.71	43.5		
:40		2200	17.22	6.51	680	1.56	46.0		

Time sampled 4:40

Weather Conditions P. Cloudy 40s Windy

Water Level Start 1.62'

Water Level Finish 3.95'

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

X

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW-3

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 1800 mL post pump calibration.

Date / Time Initiated: 11 – 11 -20 @ 2:13 Date / Time Completed: 11 – 11 -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data:

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
2:16	200	600	16.09	5.97	1034	5.17	76.5		Cloudy
:18		1000	16.05	5.80	1038	3.40	72.0		
:20		1400	16.00	5.71	1039	2.66	69.2		
:22		1800	15.95	5.68	1038	2.28	64.0		

Time sampled 2:25

Weather Conditions Clear 40's

Water Level Start 1.72'

Water Level Finish 1.76'

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW-4

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 1600+ mL post pump calibration.

Date / Time Initiated: 11 – 10 -20 @ 3:53 Date / Time Completed: 11 – 10 -20 @ 4:00

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data: 50 ml/min * sucked up mud/sed.

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
3:58	200	600	15.05	6.91	1218	2.67	30.16		Cloudy
4:00		1000	15.10	6.80	1463	1.84	22.1		
:02		1400	15.07	6.80	1506	1.84	14.5		
:04		1600	15.02	6.80	1526	1.73	8.02		

4:03 :05 :07 :09

Time sampled 4:10

Weather Conditions Windy, 40s Cloudy

Water Level Start 6.01'

Water Level Finish 11.46'

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW-5

Sample [X] Blind Duplicate [X] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing** 3:35

Actual Purge Volume Removed: 2000 mL post pump calibration.

Date / Time Initiated: 11 – 10 -20 @ 3:18 Date / Time Completed: 11 – 10 -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data: 50 ml/min

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
3824	200	1200	16.03	7.67	770	5.65	22.0		C
:26		1400	15.83	7.63	761	5.40	22.7		
:28		1600	15.85	7.61	748	5.16	23.1		
:30		2000	15.82	7.60	738	4.99	23.7		

Time sampled 3:30

Weather Conditions Cloudy 40s Windy

Water Level Start 0.00'

Water Level Finish 5.53'

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

X

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW-5A

Sample [X] Blind Duplicate [ ] Field Blank [ ].

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2200 mL post pump calibration.

Date / Time Initiated: 11 – -20 @ 2:46 Date / Time Completed: 11 – -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data: 50 ml/min

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
2:51	200	1000	15.36	6.75	3308	2.66	59.1		C
:53		1400	15.43	6.73	3372	2.30	43.0		
:55		1800	15.42	6.72	3373	1.98	31.6		
:57		2200	15.41	6.72	3399	1.82	22.4		

Time sampled 17:00

Weather Conditions Windy 40s Cloudy

Water Level Start 9.42'

Water Level Finish 15.02'

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

Field Sampling Log

Facility: Asbury CCR (Permit #) Monitoring Well ID: MW- 6

Sample [X] Blind Duplicate [ ] Field Blank [X] 2:40

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 1800 mL post pump calibration.

Date / Time Initiated: 11 – 10 -20 @ 2:24 Date / Time Completed: 11 – 10 -20 @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data: 50ml/min ✓

Time	Purge Rate (mL/min)	Cumulative Volume (mL)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
2:27	200 ✓	600	15.56	7.25	1714	4.29	51.0		C
:29		1000	15.53	7.14	1744	3.18	56.4		↓
:31		1400	15.47	7.01	1751	2.65	56.7		
:33		1800	15.49	6.96	1759	2.36	52.0		✓

Time sampled 2:35

Weather Conditions Cloudy 40's windy

Water Level Start 9.20'

Water Level Finish 14.07'

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature R Elgin

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events

Constituent	Units	MW- 1	MW-2	MW-3	MW-4	MW-5	MW-5A	MW-6
pH	S.U.	NO TEST	5.83	5.08	6.30	6.83	6.82	6.72
Specific Conductance	umhos/cm	GW	0.786	1.132	2.083	0.841	1.769	1.900
Total Well Depth	ft	Level						
Average GW Depth	ft	Only	1.24	0.4	5.39	1.32	6.92	7.86
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	DON'T SAMPLE	800	800	800	800	800	800

4

Field Sampling Log

Facility: Asbury CCR (**Permit #**)

Monitoring Well ID: **MW-** 6A

Sample X **Blind Duplicate** ☐ **Field Blank** ☐

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: 2000 mL post pump calibration.

Date / Time Initiated: 5 – 10 -20 @ 1:52

Date / Time Completed: 5 – 10 -20- @

Well Purged To Dryness?: Y / N

Petroleum or Gas Detected? Y / N

Purge Data: 50 mL/min

Time	Purge Rate (mL/min)	Cumulative Volume (ml)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
1:56	200	800	16.29	7.17	1646	5.15	42.9		C
:58		1200	16.36	7.14	1641	5.03	43.2		
2:00		1600	16.24	7.12	1639	4.85	44.1		
:02		2000	16.14	7.09	1637	4.72	45.3		

Time sampled 2:05

Weather Conditions Windy 45° Cloudy

Water Level Start 8.41'

Water Level Finish 13.48'

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events for: 5/16 + 6/17

Constituent	Units	MW- 6A	MW-7					
pH	S.U.	6.87	6.12					
Specific Conductance	umhos/cm	1.601	2.699					
Total Well Depth	ft							
Average GW Depth	ft	7.28	3.04					
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	800	800					

Field Sampling Log

Facility: Asbury CCR (**Permit #**) Monitoring Well ID: **MW-** 7

Sample X **Blind Duplicate** ☐ **Field Blank** ☐.

Purge Information:

Method of Well Purge: **Peristaltic Pump with 3/8 - inch Diameter Tubing**

Actual Purge Volume Removed: mL post pump calibration.

Date / Time Initiated: 5 – 10 -20 @ 1:28 Date / Time Completed: 5 – 10 -20- @

Well Purged To Dryness?: Y / N Petroleum or Gas Detected? Y / N

Purge Data: 50 mp/min

Time	Purge Rate (mL/min)	Cumulative Volume (ml)	Temp. (°C)	pH (SU)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (MV)		Other (Color, Clarity, Odor)
1:31	200		16.82	7.01	2557	8.07	32.6		C
:33			16.76	6.90	2549	7.38	28.7		↓
:35			16.73	6.85	2546	6.98	29.1		
:37			16.73	6.81	2555	5.35	32.5		↓

Time sampled 1:40 (A, B.)

Weather Conditions Windy, 45° Cloudy

Water Level Start 5.03

Water Level Finish 5.20

Name (MEC Field Sampler): Ross S and Rick Elgin

Sampler Signature

Field Inspection	Good	Fair	Poor
Access	G	F	P
Pad Condition	G	F	P
Casing Condition	G	F	P
Locking Cap & Lock	G	F	P
Riser Condition	G	F	P

Field Inspection	Yes	No	N/A
Well ID Visible	Y	N	N/A
Standing Water	Y	N	N/A
Clear of Weeds	Y	N	N/A
Measuring Point	Y	N	N/A
Split sample with MDNR	Y	N	N/A
Maintenance Performed	Y	N	N/A
Decontamination Normal	Y	N	N/A
Equipment Calibration Normal	Y	N	N/A
Redevelopment Needed	Y	N	N/A
Any deviations from SAP	Y	N	N/A
Sediment Thickness Checked	Y	N	N/A

Historical Data: Average of sampling events for: 5/16 + 6/17

Constituent	Units	MW- 6A	MW-7					
pH	S.U.	6.87	6.12					
Specific Conductance	umhos/cm	1.601	2.699					
Total Well Depth	ft							
Average GW Depth	ft	7.28	3.04					
Average GW Drop	ft							
2 System Volumes (Min Purged Amount)	mL	800	800					

X

APPENDIX 4

Analytical Results from Lab

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Pittsburgh
301 Alpha Drive
RIDC Park
Pittsburgh, PA 15238
Tel: (412)963-7058

Laboratory Job ID: 180-113553-1
Client Project/Site: Asbury Ash Pond
Sampling Event: Asbury Ash Pond

For:
Midwest Environmental Consultants
2009 East McCarty Street
Suite 2
Jefferson City, Missouri 65101

Attn: Mr. Rick Elgin

Cathy Gartner

Authorized for release by:
11/30/2020 11:20:01 AM

Cathy Gartner, Project Manager II
(615)301-5041
Cathy.Gartner@Eurofinset.com

PA Lab ID: 02-00416

Table of Contents

Case Narrative

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Job ID: 180-113553-1

Laboratory: Eurofins TestAmerica, Pittsburgh

Narrative

Job Narrative
180-113553-1

Comments
No additional comments.

Receipt
The samples were received on 11/12/2020 9:00 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 3.1º C and 3.3º C.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Field Service / Mobile Lab
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Accreditation/Certification Summary

Client: Midwest Environmental Consultants
Job ID: 180-113553-1
Project/Site: Asbury Ash Pond

Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-21
California	State	2891	04-30-21
Connecticut	State	PH-0688	09-30-20 *
Florida	NELAP	E871008	06-30-21
Georgia	State	PA 02-00416	04-30-21
Illinois	NELAP	004375	06-30-21
Kansas	NELAP	E-10350	01-31-21
Kentucky (UST)	State	162013	04-30-21
Kentucky (WW)	State	KY98043	12-31-20
Louisiana	NELAP	04041	06-30-21
Maine	State	PA00164	03-06-22
Minnesota	NELAP	042-999-482	12-31-20
Nevada	State	PA00164	07-31-21
New Hampshire	NELAP	2030	04-05-21
New Jersey	NELAP	PA005	06-30-21
New York	NELAP	11182	04-01-21
North Carolina (WW/SW)	State	434	12-31-21
North Dakota	State	R-227	04-30-21
Oregon	NELAP	PA-2151	02-06-21
Pennsylvania	NELAP	02-00416	04-30-21
Rhode Island	State	LAO00362	12-31-20
South Carolina	State	89014	04-30-21
Texas	NELAP	T104704528	03-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462019-8	05-31-21
Virginia	NELAP	10043	09-14-21
West Virginia DEP	State	142	02-01-21
Wisconsin	State	998027800	08-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Sample Summary

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
180-113553-1	MW-2	Water	11/10/20 16:40	11/12/20 09:00	
180-113553-2	MW-3	Water	11/10/20 14:25	11/12/20 09:00	
180-113553-3	MW-4	Water	11/10/20 16:10	11/12/20 09:00	
180-113553-4	MW-5	Water	11/10/20 15:30	11/12/20 09:00	
180-113553-5	MW-5A	Water	11/10/20 15:00	11/12/20 09:00	
180-113553-6	MW-6	Water	11/10/20 14:35	11/12/20 09:00	
180-113553-7	MW-6A	Water	11/10/20 14:05	11/12/20 09:00	
180-113553-8	MW-7	Water	11/10/20 13:40	11/12/20 09:00	
180-113553-9	Duplicate	Water	11/10/20 15:35	11/12/20 09:00	
180-113553-10	Field Blank	Water	11/10/20 14:40	11/12/20 09:00	

Method Summary

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Method	Method Description	Protocol	Laboratory
EPA 9056A	Anions, Ion Chromatography	SW846	TAL PIT
EPA 6020A	Metals (ICP/MS)	SW846	TAL PIT
EPA 9040C	pH	SW846	TAL PIT
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PIT
Field Sampling	Field Sampling	EPA	TAL PIT
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT

Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-2

Date Collected: 11/10/20 16:40
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 12:16	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 17:43	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 17:40	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-3

Date Collected: 11/10/20 14:25
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 12:49	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		5			338140	11/23/20 13:05	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 17:46	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 15:25	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-4

Date Collected: 11/10/20 16:10
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 13:22	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		10			338140	11/23/20 13:38	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 17:48	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-4

Date Collected: 11/10/20 16:10
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 17:10	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-5

Date Collected: 11/10/20 15:30
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 13:55	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 17:51	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 16:30	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-5A

Date Collected: 11/10/20 15:00
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			338140	11/23/20 14:27	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		25			338140	11/23/20 14:44	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 17:59	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 16:00	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-6

Date Collected: 11/10/20 14:35
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 17:43	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		10	1 mL	1.0 mL	338140	11/23/20 18:00	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 18:01	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 15:35	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-6A

Date Collected: 11/10/20 14:05
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 18:49	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		10			338140	11/23/20 19:05	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 18:04	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337288	11/16/20 12:08	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 15:05	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: MW-7

Date Collected: 11/10/20 13:40
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		2.5			338140	11/23/20 19:21	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total/NA	Analysis	EPA 9056A		25			338140	11/23/20 19:38	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 18:06	RJR	TAL PIT
	Instrument ID: NEMO									

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-7

Lab Sample ID: 180-113553-8
Matrix: Water
Date Collected: 11/10/20 13:40
Date Received: 11/12/20 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	337289	11/16/20 12:15	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 14:40	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: Duplicate

Lab Sample ID: 180-113553-9
Matrix: Water
Date Collected: 11/10/20 15:35
Date Received: 11/12/20 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 19:54	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 18:09	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337289	11/16/20 12:15	GRB	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	Field Sampling		1			337272	11/10/20 16:35	FDS	TAL PIT
	Instrument ID: NOEQUIP									

Client Sample ID: Field Blank

Lab Sample ID: 180-113553-10
Matrix: Water
Date Collected: 11/10/20 14:40
Date Received: 11/12/20 09:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	EPA 9056A		1			338140	11/23/20 22:05	EPS	TAL PIT
	Instrument ID: CHICS2100B									
Total Recoverable	Prep	3005A			50 mL	50 mL	337453	11/17/20 15:33	TJO	TAL PIT
Total Recoverable	Analysis	EPA 6020A		1			337906	11/19/20 18:12	RJR	TAL PIT
	Instrument ID: NEMO									
Total/NA	Analysis	EPA 9040C		1			338342	11/24/20 09:55	AVS	TAL PIT
	Instrument ID: NOEQUIP									
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	337289	11/16/20 12:15	GRB	TAL PIT
	Instrument ID: NOEQUIP									

Laboratory References:

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

Lab Chronicle

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Analyst References:

Lab: TAL PIT

Batch Type: Prep

TJO = Tyler Oliver

Batch Type: Analysis

AVS = Abbey Smith
EPS = Evan Scheuer
FDS = Sampler Field
GRB = Gabriel Berghe
RJR = Ron Rosenbaum

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-2

Date Collected: 11/10/20 16:40
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-1

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		1.0	0.32	mg/L			11/23/20 12:16	1
Fluoride	0.39		0.10	0.044	mg/L			11/23/20 12:16	1
Sulfate	56		1.0	0.38	mg/L			11/23/20 12:16	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	37		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:43	1
Boron	0.16		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	430		10	10	mg/L			11/16/20 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.51				SU			11/10/20 17:40	1

Client Sample Results

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-3

Date Collected: 11/10/20 14:25
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-2

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	62		1.0	0.32	mg/L			11/23/20 12:49	1
Fluoride	0.14		0.10	0.044	mg/L			11/23/20 12:49	1
Sulfate	530		5.0	1.9	mg/L			11/23/20 13:05	5

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	92		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:46	1
Boron	0.056	J	0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	860		10	10	mg/L			11/16/20 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.9	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	5.68				SU			11/10/20 15:25	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-4

Date Collected: 11/10/20 16:10
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-3

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	4.4		1.0	0.32	mg/L			11/23/20 13:22	1
Fluoride	0.093	J	0.10	0.044	mg/L			11/23/20 13:22	1
Sulfate	550		10	3.8	mg/L			11/23/20 13:38	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	230		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:48	1
Boron	0.039	J	0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1800		10	10	mg/L			11/16/20 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.80				SU			11/10/20 17:10	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-5

Date Collected: 11/10/20 15:30
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-4

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.4		1.0	0.32	mg/L			11/23/20 13:55	1
Fluoride	0.27		0.10	0.044	mg/L			11/23/20 13:55	1
Sulfate	160		1.0	0.38	mg/L			11/23/20 13:55	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	71		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:51	1
Boron	0.25		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	510		10	10	mg/L			11/16/20 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.9	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.60				SU			11/10/20 16:30	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-5A

Date Collected: 11/10/20 15:00
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-5

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	170		2.5	0.80	mg/L			11/23/20 14:27	2.5
Fluoride	0.24	J	0.25	0.11	mg/L			11/23/20 14:27	2.5
Sulfate	2300		25	9.5	mg/L			11/23/20 14:44	25

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	380		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:59	1
Boron	1.9		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	3200		40	40	mg/L			11/16/20 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.0	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.72				SU			11/10/20 16:00	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-6

Date Collected: 11/10/20 14:35
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-6

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13		1.0	0.32	mg/L			11/23/20 17:43	1
Fluoride	0.22		0.10	0.044	mg/L			11/23/20 17:43	1
Sulfate	1200		10	3.8	mg/L			11/23/20 18:00	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	240		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:01	1
Boron	0.32		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1700		10	10	mg/L			11/16/20 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.2	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.96				SU			11/10/20 15:35	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-6A

Date Collected: 11/10/20 14:05
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-7

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	25		1.0	0.32	mg/L			11/23/20 18:49	1
Fluoride	0.30		0.10	0.044	mg/L			11/23/20 18:49	1
Sulfate	850		10	3.8	mg/L			11/23/20 19:05	10

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	170		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:04	1
Boron	0.38		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		10	10	mg/L			11/16/20 12:08	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.5	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.09				SU			11/10/20 15:05	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: MW-7

Date Collected: 11/10/20 13:40
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-8

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	39		2.5	0.80	mg/L			11/23/20 19:21	2.5
Fluoride	0.16	J	0.25	0.11	mg/L			11/23/20 19:21	2.5
Sulfate	2200		25	9.5	mg/L			11/23/20 19:38	25

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	460		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:06	1
Boron	0.22		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2800		20	20	mg/L			11/16/20 12:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.7	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.81				SU			11/10/20 14:40	1

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Client Sample ID: Duplicate

Date Collected: 11/10/20 15:35
Date Received: 11/12/20 09:00

Lab Sample ID: 180-113553-9

Matrix: Water

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	6.4		1.0	0.32	mg/L			11/23/20 19:54	1
Fluoride	0.28		0.10	0.044	mg/L			11/23/20 19:54	1
Sulfate	170		1.0	0.38	mg/L			11/23/20 19:54	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	71		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:09	1
Boron	0.24		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	540		10	10	mg/L			11/16/20 12:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.8	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.60				SU			11/10/20 16:35	1

Client: Midwest Environmental Consultants
Job ID: 180-113553-1
Project/Site: Asbury Ash Pond

Client Sample ID: Field Blank
Lab Sample ID: 180-113553-10
Date Collected: 11/10/20 14:40
Matrix: Water
Date Received: 11/12/20 09:00

Method: EPA 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	13		1.0	0.32	mg/L			11/23/20 22:05	1
Fluoride	1.4		0.10	0.044	mg/L			11/23/20 22:05	1
Sulfate	ND		1.0	0.38	mg/L			11/23/20 22:05	1

Method: EPA 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	0.39	J	0.50	0.13	mg/L		11/17/20 15:33	11/19/20 18:12	1
Boron	ND		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 18:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	33		10	10	mg/L			11/16/20 12:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.1	HF	0.1	0.1	SU			11/24/20 09:55	1

Method: EPA 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 180-338140/30
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/23/20 15:49	1
Fluoride	ND		0.10	0.044	mg/L			11/23/20 15:49	1
Sulfate	ND		1.0	0.38	mg/L			11/23/20 15:49	1

Lab Sample ID: MB 180-338140/6
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.0	0.32	mg/L			11/23/20 06:32	1
Fluoride	ND		0.10	0.044	mg/L			11/23/20 06:32	1
Sulfate	ND		1.0	0.38	mg/L			11/23/20 06:32	1

Lab Sample ID: LCS 180-338140/29
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.4		mg/L		99	80 - 120
Fluoride	2.50	2.54		mg/L		102	80 - 120
Sulfate	50.0	47.8		mg/L		96	80 - 120

Lab Sample ID: LCS 180-338140/5
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	50.0	49.9		mg/L		100	80 - 120
Fluoride	2.50	2.59		mg/L		104	80 - 120
Sulfate	50.0	49.0		mg/L		98	80 - 120

Lab Sample ID: 180-113523-C-1 MS
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	ND	F1	50.0	72.9	F1	mg/L		146	80 - 120
Fluoride	0.18		2.50	2.49		mg/L		92	80 - 120
Sulfate	5.8		50.0	47.2		mg/L		83	80 - 120

Lab Sample ID: 180-113523-C-1 MSD
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	ND	F1	50.0	73.4	F1	mg/L		147	80 - 120	1	15
Fluoride	0.18		2.50	2.60		mg/L		97	80 - 120	4	15
Sulfate	5.8		50.0	53.9		mg/L		96	80 - 120	13	15

Method: EPA 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: 180-113523-C-17 MS
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	9.1		50.0	59.9		mg/L		101	80 - 120
Fluoride	ND		2.50	2.60		mg/L		104	80 - 120
Sulfate	0.51	J	50.0	50.7		mg/L		100	80 - 120

Lab Sample ID: 180-113523-C-17 MSD
Matrix: Water
Analysis Batch: 338140

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	9.1		50.0	61.1		mg/L		104	80 - 120	2	15
Fluoride	ND		2.50	2.74		mg/L		110	80 - 120	5	15
Sulfate	0.51	J	50.0	52.7		mg/L		104	80 - 120	4	15

Method: EPA 6020A - Metals (ICP/MS)

Lab Sample ID: MB 180-337453/1-A
Matrix: Water
Analysis Batch: 337906

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 337453

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		0.50	0.13	mg/L		11/17/20 15:33	11/19/20 17:38	1
Boron	ND		0.080	0.039	mg/L		11/17/20 15:33	11/19/20 17:38	1

Lab Sample ID: LCS 180-337453/2-A
Matrix: Water
Analysis Batch: 337906

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 337453

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	25.0	26.0		mg/L		104	80 - 120
Boron	1.25	1.14		mg/L		92	80 - 120

Lab Sample ID: 180-113553-10 MS
Matrix: Water
Analysis Batch: 337906

Client Sample ID: Field Blank
Prep Type: Total Recoverable
Prep Batch: 337453

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	0.39	J	25.0	26.2		mg/L		103	75 - 125
Boron	ND		1.25	1.13		mg/L		91	75 - 125

Lab Sample ID: 180-113553-10 MSD
Matrix: Water
Analysis Batch: 337906

Client Sample ID: Field Blank
Prep Type: Total Recoverable
Prep Batch: 337453

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	0.39	J	25.0	25.8		mg/L		102	75 - 125	1	20
Boron	ND		1.25	1.15		mg/L		92	75 - 125	1	20

Method: EPA 9040C - pH

Lab Sample ID: LCS 180-338342/1
Matrix: Water
Analysis Batch: 338342

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.0		SU		100	99 - 101		

Lab Sample ID: 180-113548-D-2 DU
Matrix: Water
Analysis Batch: 338342

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	5.9			5.9		SU				0.3	2

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 180-337288/2
Matrix: Water
Analysis Batch: 337288

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			11/16/20 12:08	1

Lab Sample ID: LCS 180-337288/1
Matrix: Water
Analysis Batch: 337288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			714	662		mg/L		93	80 - 120		

Lab Sample ID: 180-113548-D-2 DU
Matrix: Water
Analysis Batch: 337288

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	530			545		mg/L				2	10

Lab Sample ID: MB 180-337289/2
Matrix: Water
Analysis Batch: 337289

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		10	10	mg/L			11/16/20 12:15	1

Lab Sample ID: LCS 180-337289/1
Matrix: Water
Analysis Batch: 337289

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			714	654		mg/L		92	80 - 120		

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: 180-113553-9 DU
Matrix: Water
Analysis Batch: 337289

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	540			545		mg/L				1	10

HPLC/IC

Analysis Batch: 338140

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	EPA 9056A	
180-113553-2	MW-3	Total/NA	Water	EPA 9056A	
180-113553-2	MW-3	Total/NA	Water	EPA 9056A	
180-113553-3	MW-4	Total/NA	Water	EPA 9056A	
180-113553-3	MW-4	Total/NA	Water	EPA 9056A	
180-113553-4	MW-5	Total/NA	Water	EPA 9056A	
180-113553-5	MW-5A	Total/NA	Water	EPA 9056A	
180-113553-5	MW-5A	Total/NA	Water	EPA 9056A	
180-113553-6	MW-6	Total/NA	Water	EPA 9056A	
180-113553-6	MW-6	Total/NA	Water	EPA 9056A	
180-113553-7	MW-6A	Total/NA	Water	EPA 9056A	
180-113553-7	MW-6A	Total/NA	Water	EPA 9056A	
180-113553-8	MW-7	Total/NA	Water	EPA 9056A	
180-113553-8	MW-7	Total/NA	Water	EPA 9056A	
180-113553-9	Duplicate	Total/NA	Water	EPA 9056A	
180-113553-10	Field Blank	Total/NA	Water	EPA 9056A	
MB 180-338140/30	Method Blank	Total/NA	Water	EPA 9056A	
MB 180-338140/6	Method Blank	Total/NA	Water	EPA 9056A	
LCS 180-338140/29	Lab Control Sample	Total/NA	Water	EPA 9056A	
LCS 180-338140/5	Lab Control Sample	Total/NA	Water	EPA 9056A	
180-113523-C-1 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-113523-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	
180-113523-C-17 MS	Matrix Spike	Total/NA	Water	EPA 9056A	
180-113523-C-17 MSD	Matrix Spike Duplicate	Total/NA	Water	EPA 9056A	

Metals

Prep Batch: 337453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total Recoverable	Water	3005A	
180-113553-2	MW-3	Total Recoverable	Water	3005A	
180-113553-3	MW-4	Total Recoverable	Water	3005A	
180-113553-4	MW-5	Total Recoverable	Water	3005A	
180-113553-5	MW-5A	Total Recoverable	Water	3005A	
180-113553-6	MW-6	Total Recoverable	Water	3005A	
180-113553-7	MW-6A	Total Recoverable	Water	3005A	
180-113553-8	MW-7	Total Recoverable	Water	3005A	
180-113553-9	Duplicate	Total Recoverable	Water	3005A	
180-113553-10	Field Blank	Total Recoverable	Water	3005A	
MB 180-337453/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-337453/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
180-113553-10 MS	Field Blank	Total Recoverable	Water	3005A	
180-113553-10 MSD	Field Blank	Total Recoverable	Water	3005A	

Analysis Batch: 337906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total Recoverable	Water	EPA 6020A	337453
180-113553-2	MW-3	Total Recoverable	Water	EPA 6020A	337453
180-113553-3	MW-4	Total Recoverable	Water	EPA 6020A	337453
180-113553-4	MW-5	Total Recoverable	Water	EPA 6020A	337453
180-113553-5	MW-5A	Total Recoverable	Water	EPA 6020A	337453

Metals (Continued)

Analysis Batch: 337906 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-6	MW-6	Total Recoverable	Water	EPA 6020A	337453
180-113553-7	MW-6A	Total Recoverable	Water	EPA 6020A	337453
180-113553-8	MW-7	Total Recoverable	Water	EPA 6020A	337453
180-113553-9	Duplicate	Total Recoverable	Water	EPA 6020A	337453
180-113553-10	Field Blank	Total Recoverable	Water	EPA 6020A	337453
MB 180-337453/1-A	Method Blank	Total Recoverable	Water	EPA 6020A	337453
LCS 180-337453/2-A	Lab Control Sample	Total Recoverable	Water	EPA 6020A	337453
180-113553-10 MS	Field Blank	Total Recoverable	Water	EPA 6020A	337453
180-113553-10 MSD	Field Blank	Total Recoverable	Water	EPA 6020A	337453

General Chemistry

Analysis Batch: 337288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	SM 2540C	
180-113553-2	MW-3	Total/NA	Water	SM 2540C	
180-113553-3	MW-4	Total/NA	Water	SM 2540C	
180-113553-4	MW-5	Total/NA	Water	SM 2540C	
180-113553-5	MW-5A	Total/NA	Water	SM 2540C	
180-113553-6	MW-6	Total/NA	Water	SM 2540C	
180-113553-7	MW-6A	Total/NA	Water	SM 2540C	
MB 180-337288/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-337288/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-113548-D-2 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 337289

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-8	MW-7	Total/NA	Water	SM 2540C	
180-113553-9	Duplicate	Total/NA	Water	SM 2540C	
180-113553-10	Field Blank	Total/NA	Water	SM 2540C	
MB 180-337289/2	Method Blank	Total/NA	Water	SM 2540C	
LCS 180-337289/1	Lab Control Sample	Total/NA	Water	SM 2540C	
180-113553-9 DU	Duplicate	Total/NA	Water	SM 2540C	

Analysis Batch: 338342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	EPA 9040C	
180-113553-2	MW-3	Total/NA	Water	EPA 9040C	
180-113553-3	MW-4	Total/NA	Water	EPA 9040C	
180-113553-4	MW-5	Total/NA	Water	EPA 9040C	
180-113553-5	MW-5A	Total/NA	Water	EPA 9040C	
180-113553-6	MW-6	Total/NA	Water	EPA 9040C	
180-113553-7	MW-6A	Total/NA	Water	EPA 9040C	
180-113553-8	MW-7	Total/NA	Water	EPA 9040C	
180-113553-9	Duplicate	Total/NA	Water	EPA 9040C	
180-113553-10	Field Blank	Total/NA	Water	EPA 9040C	
LCS 180-338342/1	Lab Control Sample	Total/NA	Water	EPA 9040C	
180-113548-D-2 DU	Duplicate	Total/NA	Water	EPA 9040C	

QC Association Summary

Client: Midwest Environmental Consultants
Project/Site: Asbury Ash Pond

Job ID: 180-113553-1

Field Service / Mobile Lab

Analysis Batch: 337272

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
180-113553-1	MW-2	Total/NA	Water	Field Sampling	
180-113553-2	MW-3	Total/NA	Water	Field Sampling	
180-113553-3	MW-4	Total/NA	Water	Field Sampling	
180-113553-4	MW-5	Total/NA	Water	Field Sampling	
180-113553-5	MW-5A	Total/NA	Water	Field Sampling	
180-113553-6	MW-6	Total/NA	Water	Field Sampling	
180-113553-7	MW-6A	Total/NA	Water	Field Sampling	
180-113553-8	MW-7	Total/NA	Water	Field Sampling	
180-113553-9	Duplicate	Total/NA	Water	Field Sampling	

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: REERS	Lab PM: Gartner, Cathy	Carrier Tracking No(s):	COC No: 490-52767-15725.1
Client Contact: Mr. Rick Elgin	Phone: 573-636-9454	E-Mail: cathy.gartner@testamericainc.com		Page: Page 1 of 1
Company: Midwest Environmental Consultants				Job #:
Address: 2009 East McCarty Street Suite 2	Due Date Requested: STD			
City: Jefferson City	TAT Requested (days):			
State, Zip: MO, 65101				
Phone: 573-636-9454(Tel)	PO #: Purchase Order not required			
Email: relgin@mecpc.com	WO #:			
Project Name: Asbury Ash Pond	Project #: 49010011			
Site:	SSOW#:			

180-113553 Chain of Custody

Codes:
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9056 Chloride, Fluoride, Sulfate	2540C_Calcd - Total Dissolved Solids	6020 Metals - Ca and Boron	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	D		
MW-2	11-10-20	4:40	G	GW			X	X	X		Field pH: 6.51
MW-3	11-10-20	2:25									Field pH: 5.68
MW-4	11-10-20	4:10									Field pH: 6.80
MW-5		3:30									Field pH: 7.60
MW-5A		3:00									Field pH: 6.72
MW-6		2:35									Field pH: 6.96
MW-6A		2:05									Field pH: 7.09
MW-7		1:40									Field pH: 6.81
Dup (MW-5)		3:35									Field pH: 7.60
Field Blank		[redacted]									Field pH: [redacted]
		2:40									Field pH:

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: 6020A/6010C - Sb,As,Ba,Be,B,Cd,Ca,Cr,Co,Pb,,Mo, Li

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	11-11-20 1:30	MEC	FedEx	11-11-20 1:30	FedEx
2	Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 11/12/20 900	Company Bomlib
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Midwest Environmental Consultants

Job Number: 180-113553-1

Login Number: 113553
List Number: 1
Creator: Say, Thomas C

List Source: Eurofins TestAmerica, Pittsburgh

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

APPENDIX 5

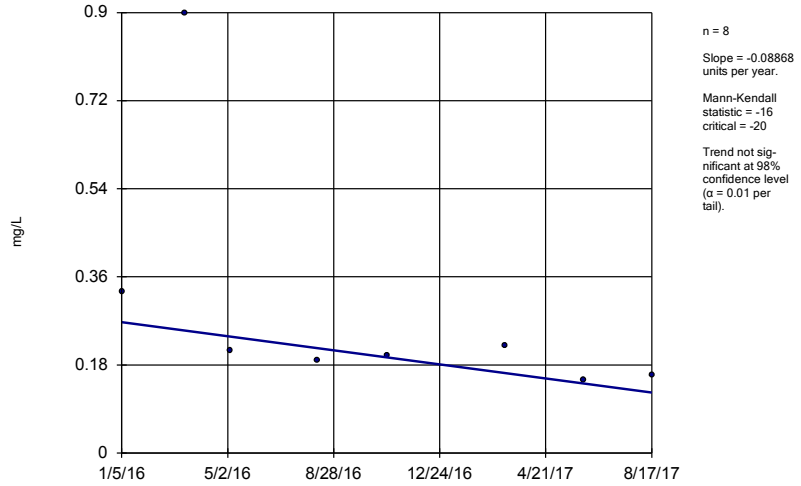
Statistical Analysis

Sanitas™ Output – Background

Trending Analysis

Boron

MW-2 (bg)



n = 8

Slope = -0.08868 units per year.

Mann-Kendall statistic = -16
critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

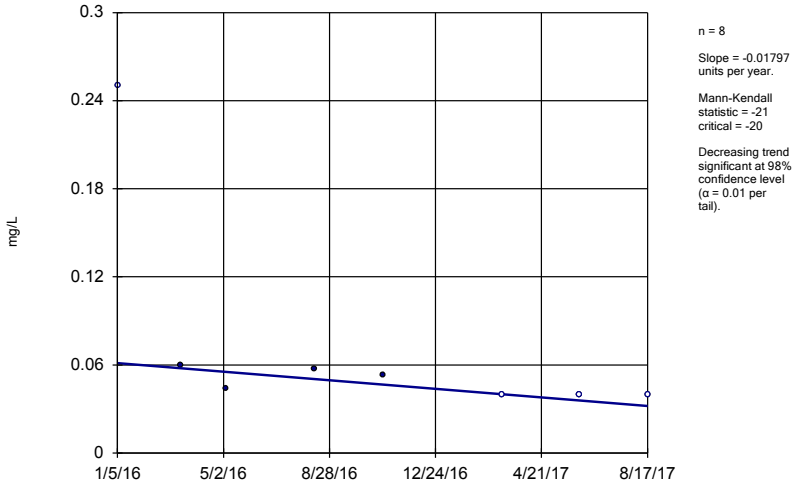
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Boron

MW-3 (bg)



n = 8

Slope = -0.01797 units per year.

Mann-Kendall statistic = -21
critical = -20

Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

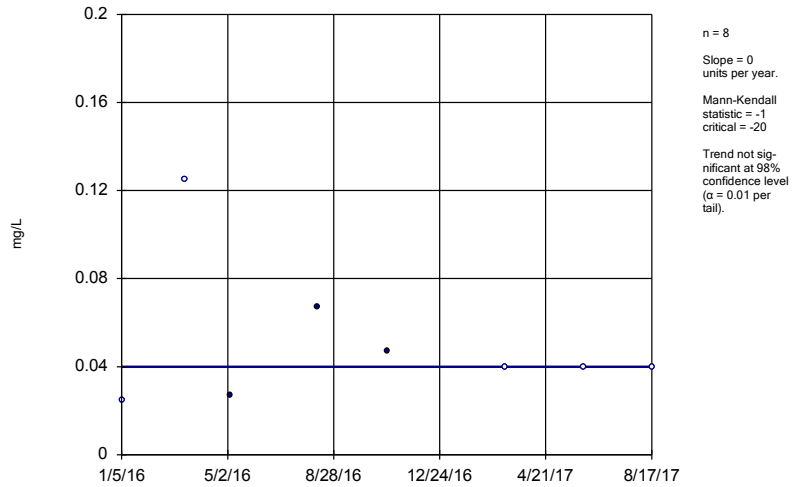
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Boron

MW-4



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -1
critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

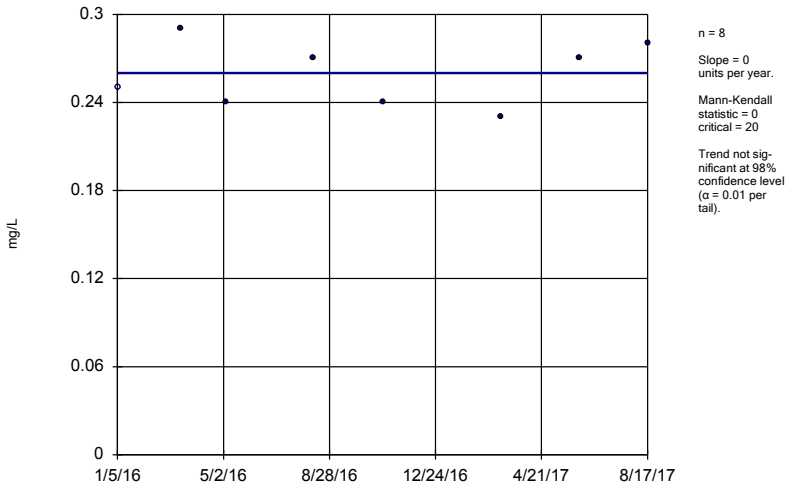
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Boron

MW-5



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 0
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

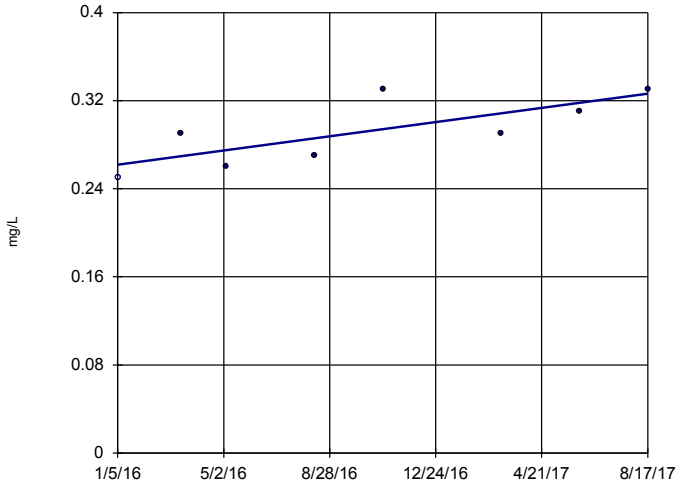
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-5A



n = 8

Slope = 0.03993 units per year.

Mann-Kendall statistic = 18 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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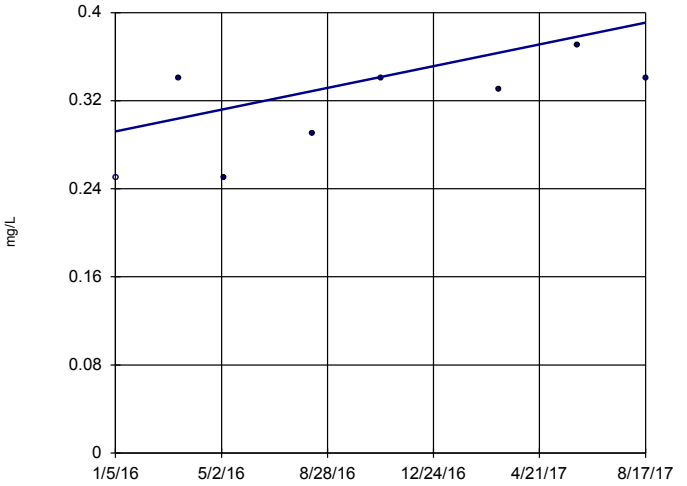
Hollow symbols indicate censored values.

Boron

MW-6



n = 8

Slope = 0.06117 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

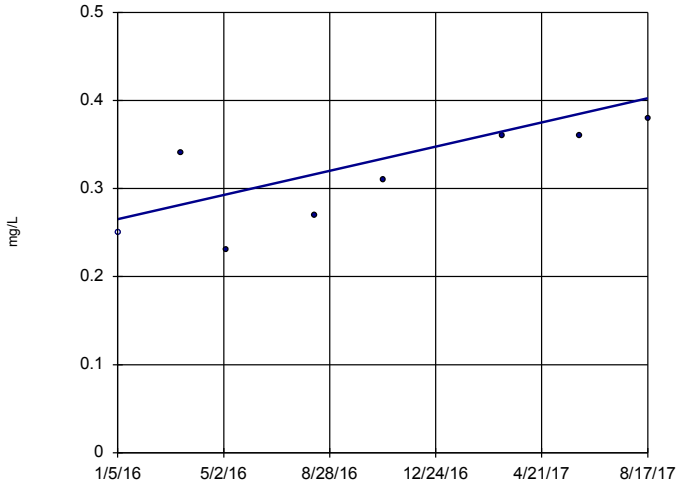
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-6A



n = 8

Slope = 0.08497 units per year.

Mann-Kendall statistic = 19 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

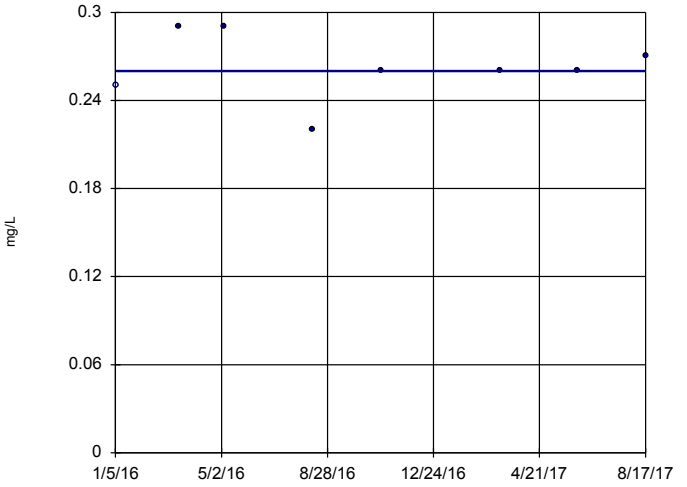
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron

MW-7



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 2 critical = 20

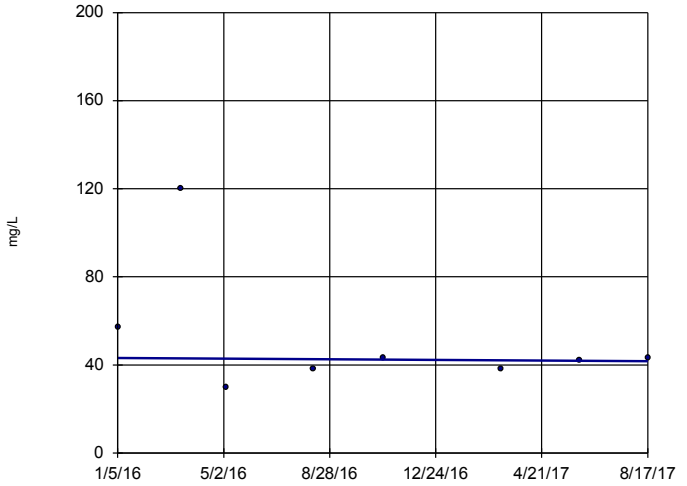
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Calcium

MW-2 (bg)



n = 8

Slope = -0.8333 units per year.

Mann-Kendall statistic = -2 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

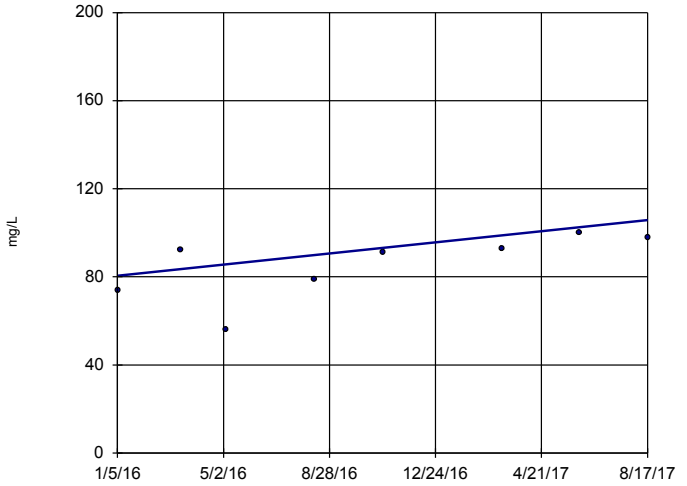
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-3 (bg)



n = 8

Slope = 15.6 units per year.

Mann-Kendall statistic = 18 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

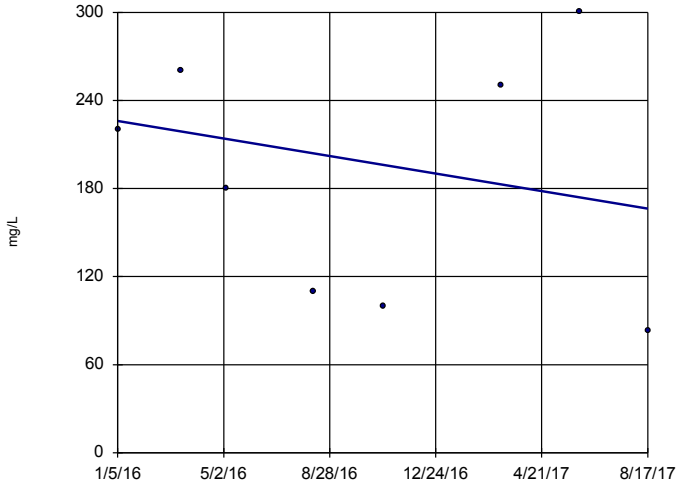
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-4



n = 8

Slope = -36.95 units per year.

Mann-Kendall statistic = -6 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

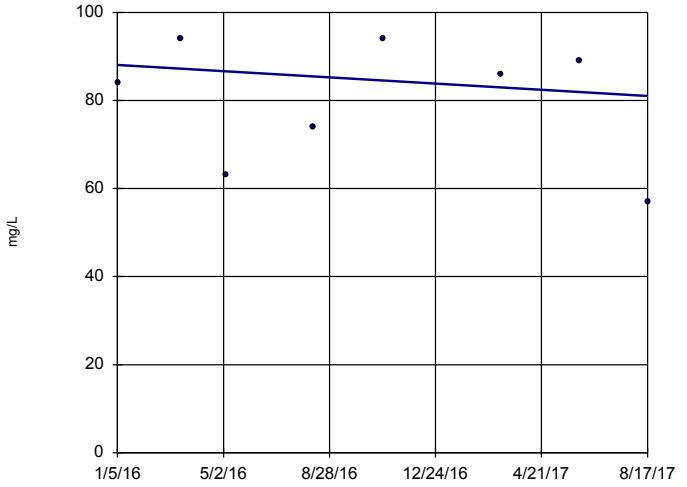
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-5



n = 8

Slope = -4.395 units per year.

Mann-Kendall statistic = -3 critical = -20

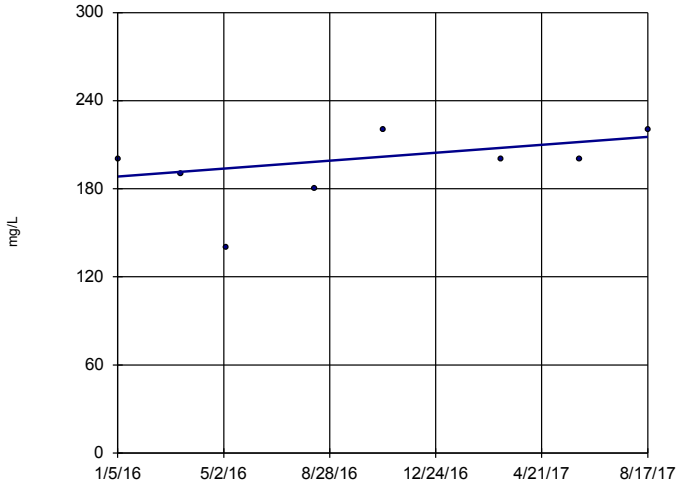
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Calcium

MW-5A



n = 8

Slope = 16.74 units per year.

Mann-Kendall statistic = 10
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

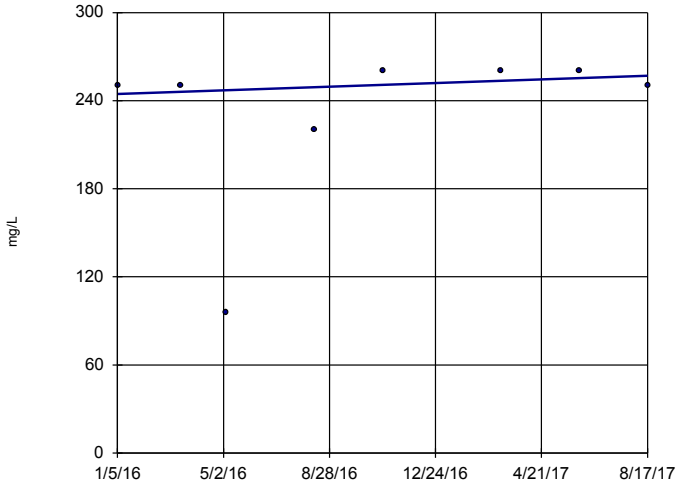
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-6



n = 8

Slope = 7.67 units per year.

Mann-Kendall statistic = 8
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

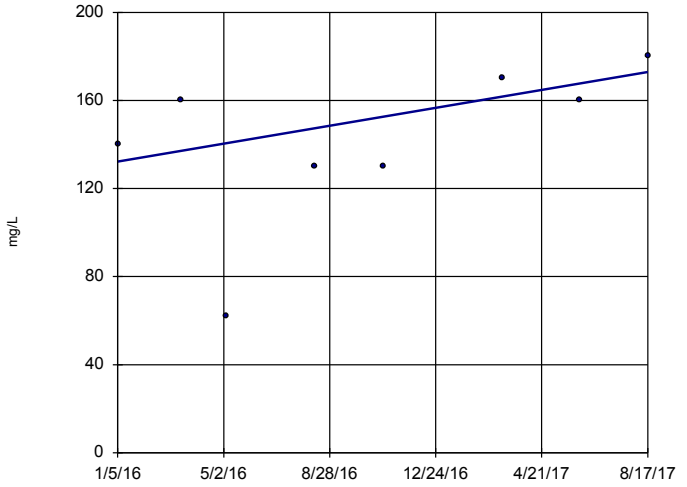
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-6A



n = 8

Slope = 25.16 units per year.

Mann-Kendall statistic = 12
critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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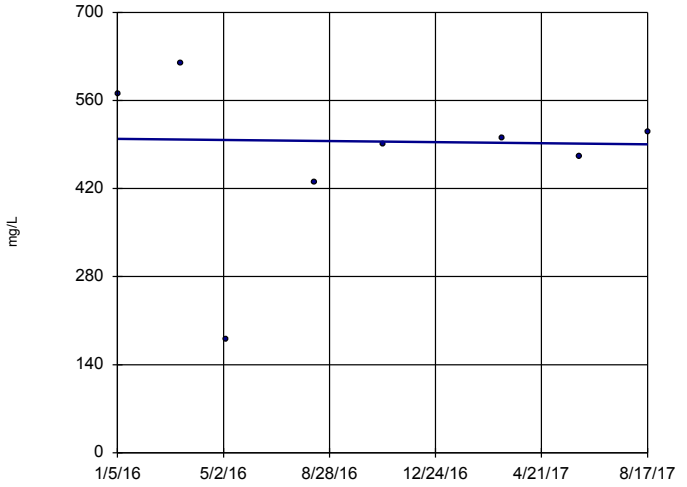
Calcium

MW-7



n = 8

Slope = -5.401 units per year.

Mann-Kendall statistic = 0
critical = 20

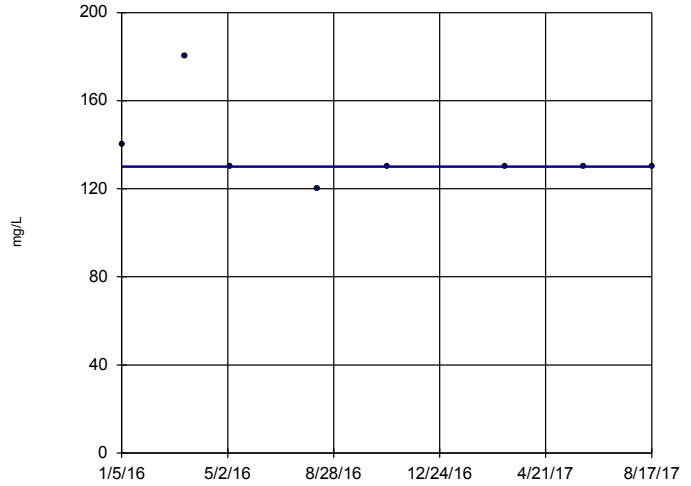
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Chloride

MW-2 (bg)



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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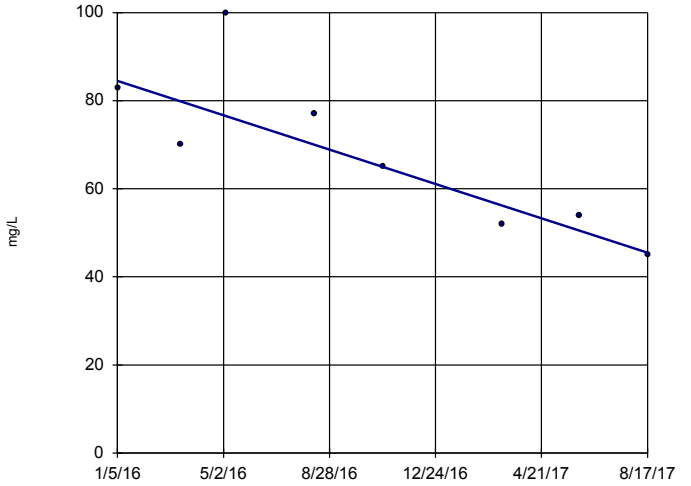
Chloride

MW-3 (bg)



n = 8

Slope = -24.13 units per year.

Mann-Kendall statistic = -20 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

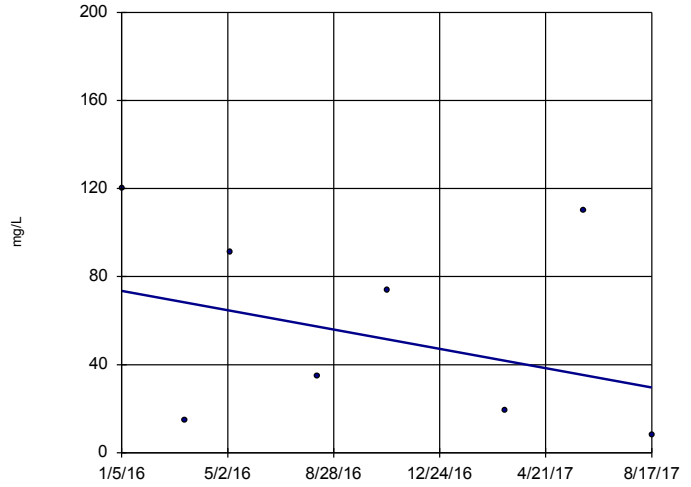
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-4



n = 8

Slope = -27.17 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

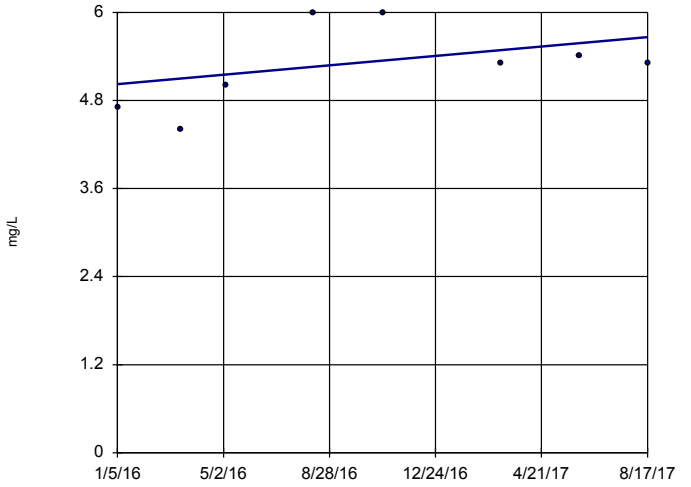
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-5



n = 8

Slope = 0.3955 units per year.

Mann-Kendall statistic = 10 critical = 20

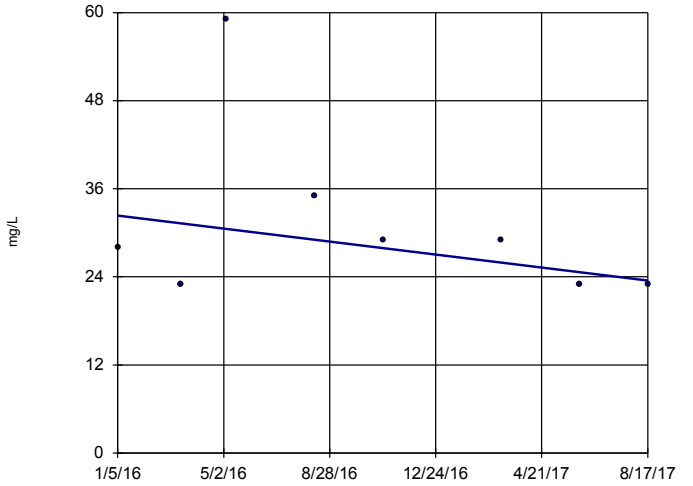
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Chloride

MW-5A



n = 8

Slope = -5.487 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

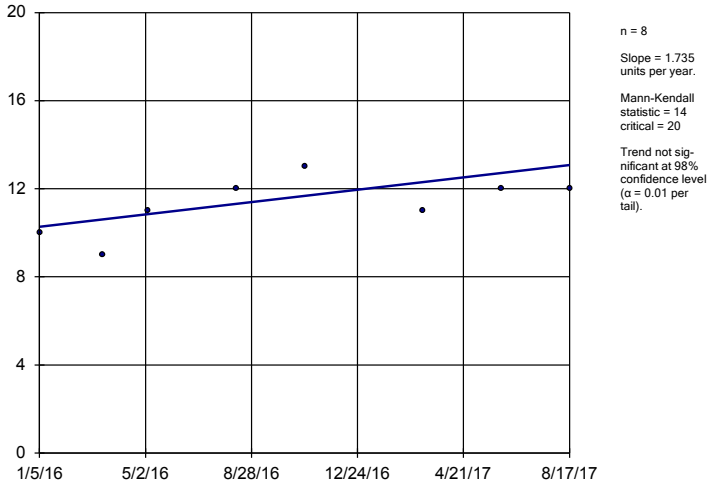
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6



n = 8

Slope = 1.735 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

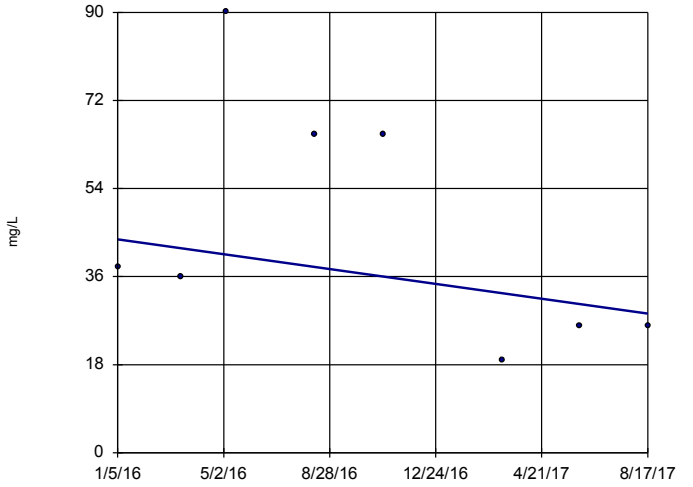
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-6A



n = 8

Slope = -9.402 units per year.

Mann-Kendall statistic = -10 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

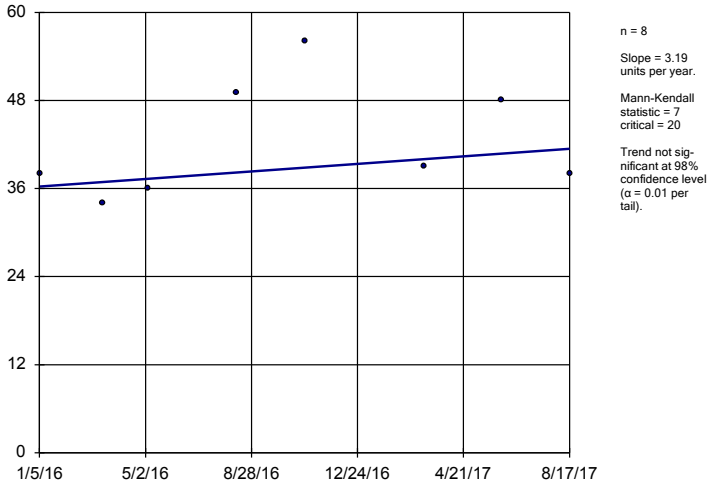
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-7



n = 8

Slope = 3.19 units per year.

Mann-Kendall statistic = 7 critical = 20

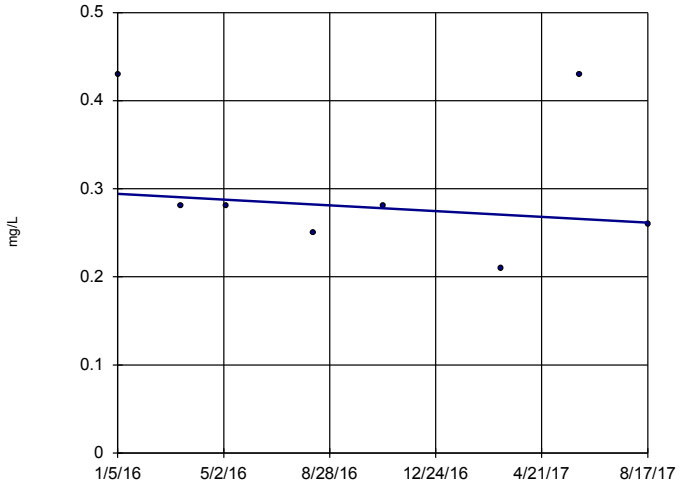
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-2 (bg)



n = 8

Slope = -0.02016 units per year.

Mann-Kendall statistic = -8 critical = -20

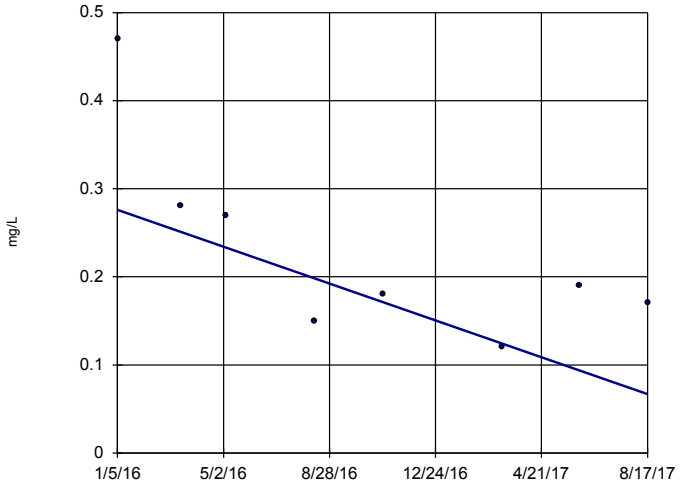
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-3 (bg)



n = 8

Slope = -0.1295 units per year.

Mann-Kendall statistic = -16 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

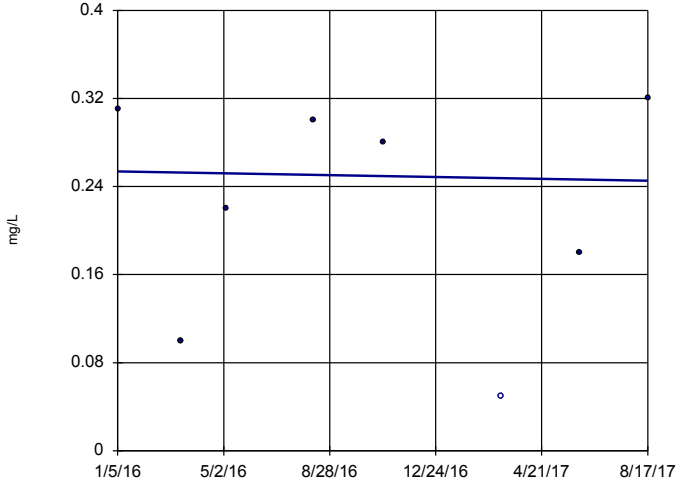
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Hollow symbols indicate censored values.

Fluoride

MW-4



n = 8

Slope = -0.005278 units per year.

Mann-Kendall statistic = 0 critical = 20

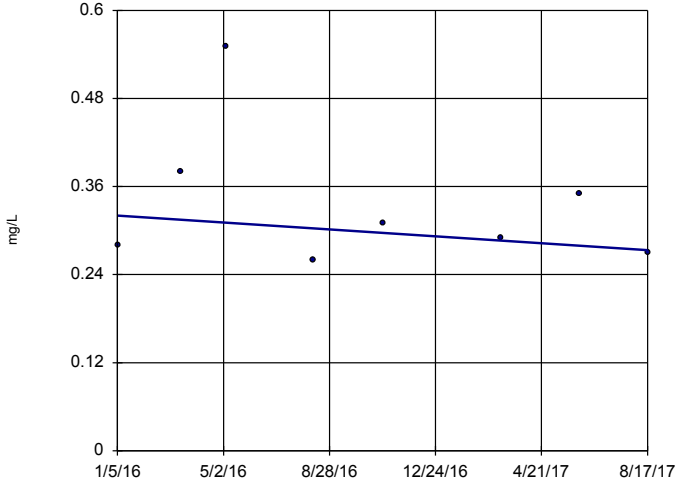
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-5



n = 8

Slope = -0.0291 units per year.

Mann-Kendall statistic = -4 critical = -20

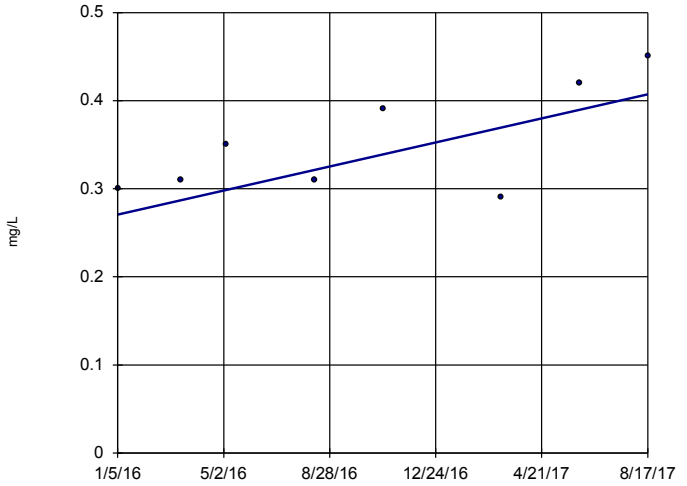
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Fluoride

MW-5A



n = 8

Slope = 0.08456 units per year.

Mann-Kendall statistic = 15 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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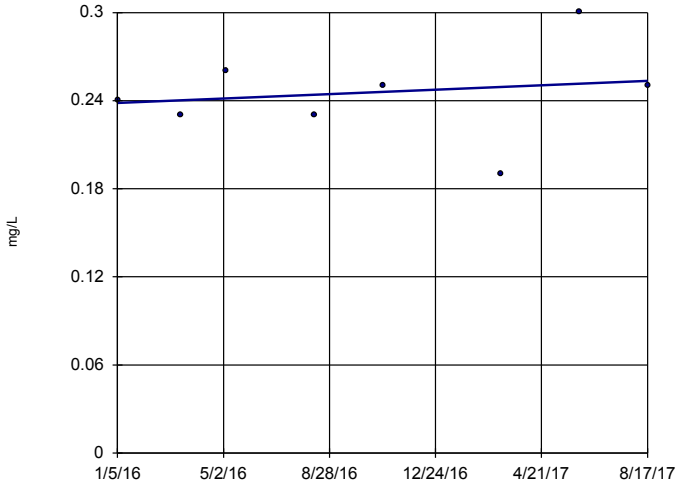
Fluoride

MW-6



n = 8

Slope = 0.00928 units per year.

Mann-Kendall statistic = 4 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

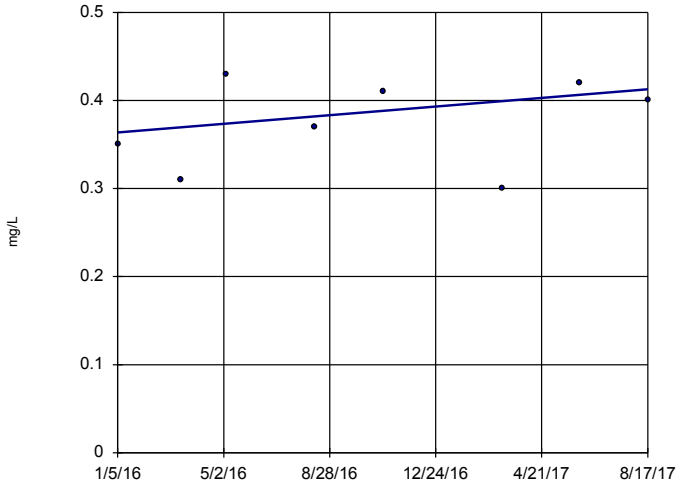
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Fluoride

MW-6A



n = 8

Slope = 0.03022 units per year.

Mann-Kendall statistic = 4 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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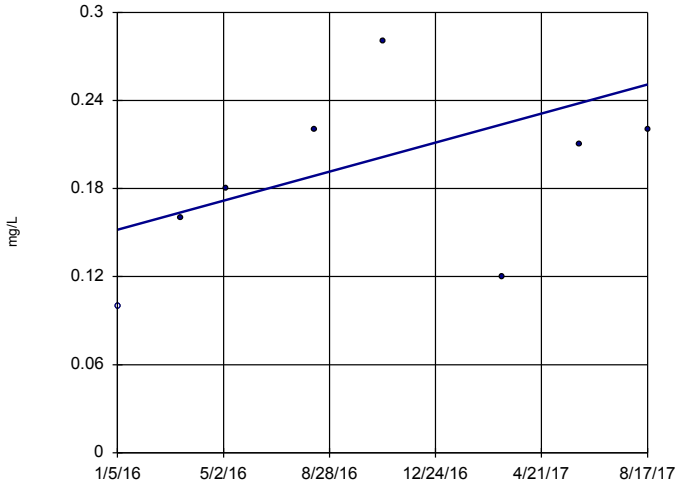
Hollow symbols indicate censored values.

Fluoride

MW-7



n = 8

Slope = 0.06113 units per year.

Mann-Kendall statistic = 13 critical = 20

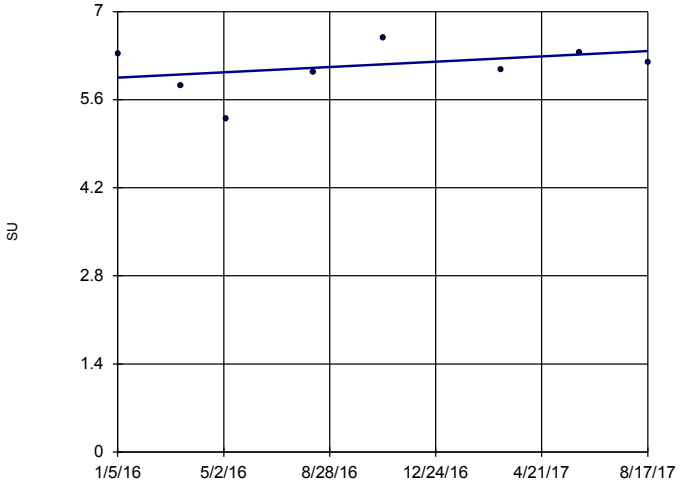
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

pH

MW-2 (bg)



n = 8

Slope = 0.2618 units per year.

Mann-Kendall statistic = 8 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

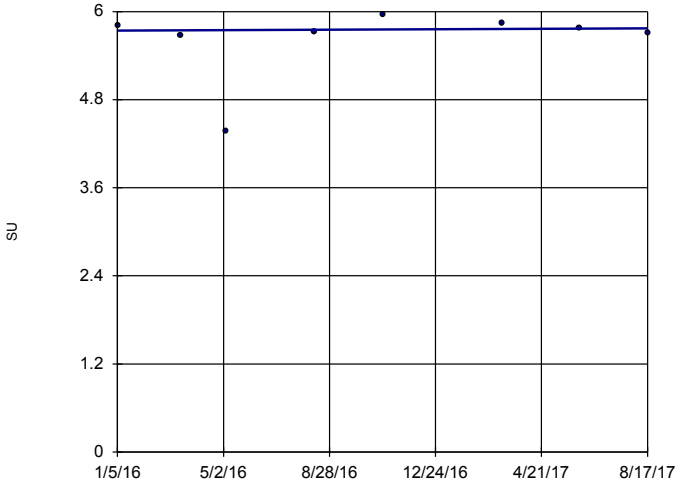
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-3 (bg)



n = 8

Slope = 0.01982 units per year.

Mann-Kendall statistic = 2 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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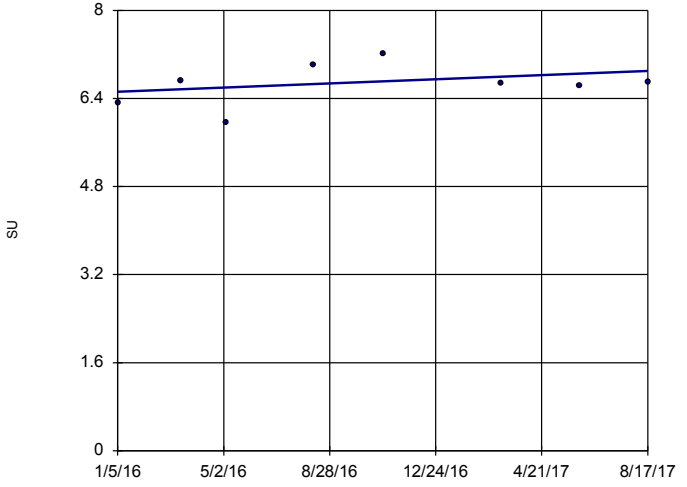
pH

MW-4



n = 8

Slope = 0.2307 units per year.

Mann-Kendall statistic = 4 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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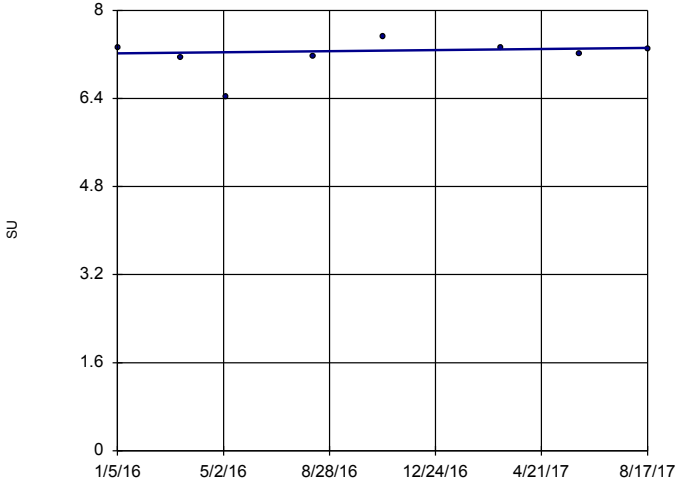
pH

MW-5



n = 8

Slope = 0.05967 units per year.

Mann-Kendall statistic = 4 critical = 20

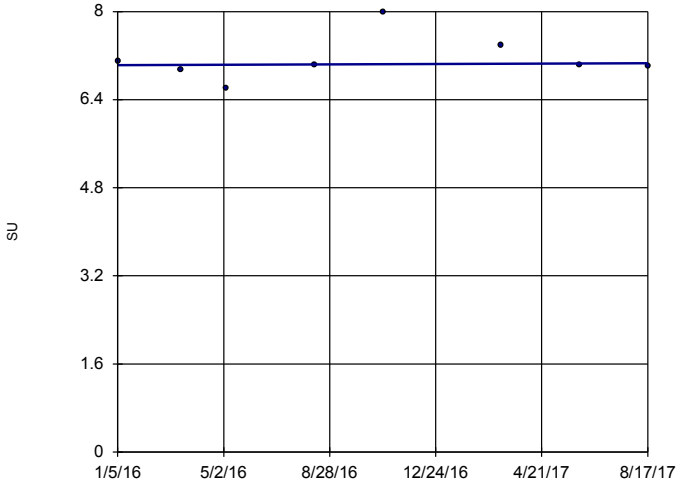
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

pH

MW-5A



n = 8

Slope = 0.0211 units per year.

Mann-Kendall statistic = 1 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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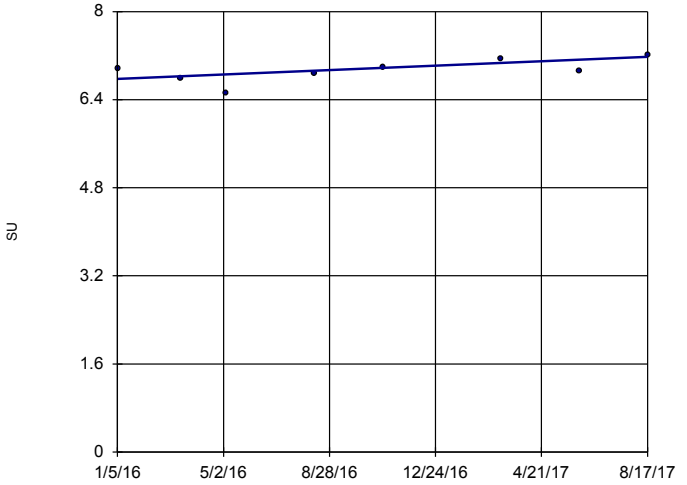
pH

MW-6



n = 8

Slope = 0.2471 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

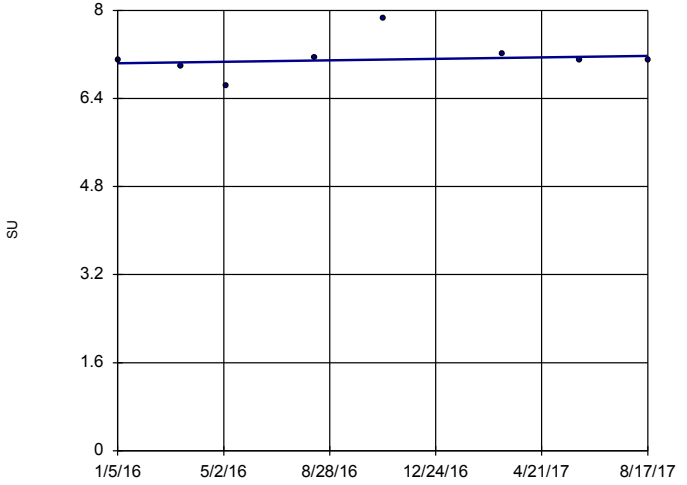
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-6A



n = 8

Slope = 0.08386 units per year.

Mann-Kendall statistic = 7 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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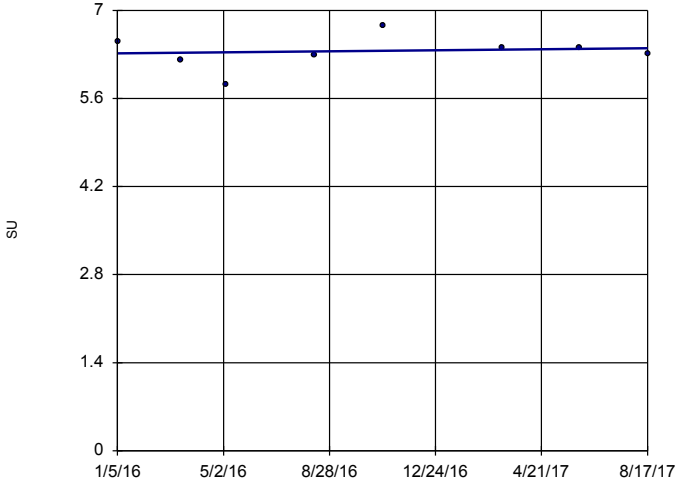
pH

MW-7



n = 8

Slope = 0.04935 units per year.

Mann-Kendall statistic = 4 critical = 20

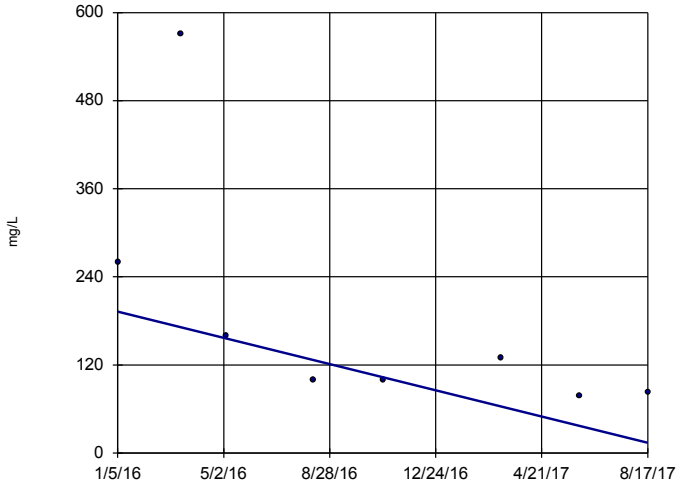
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sulfate

MW-2 (bg)



n = 8

Slope = -110.6 units per year.

Mann-Kendall statistic = -20 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

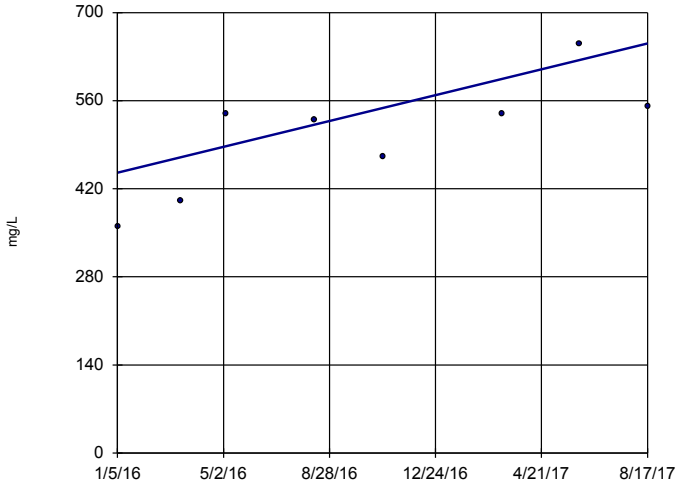
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-3 (bg)



n = 8

Slope = 126.8 units per year.

Mann-Kendall statistic = 19 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

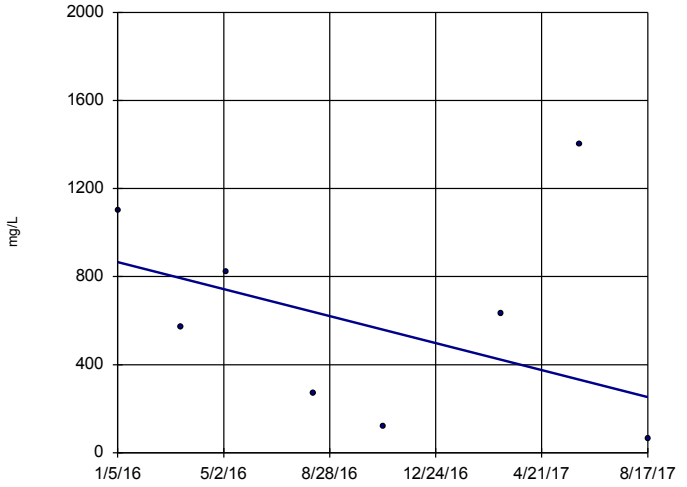
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-4



n = 8

Slope = -379.2 units per year.

Mann-Kendall statistic = -8 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

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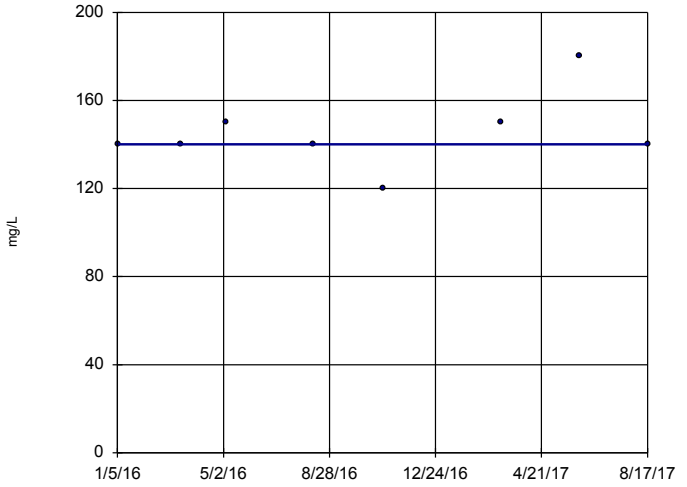
Sulfate

MW-5



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 5 critical = 20

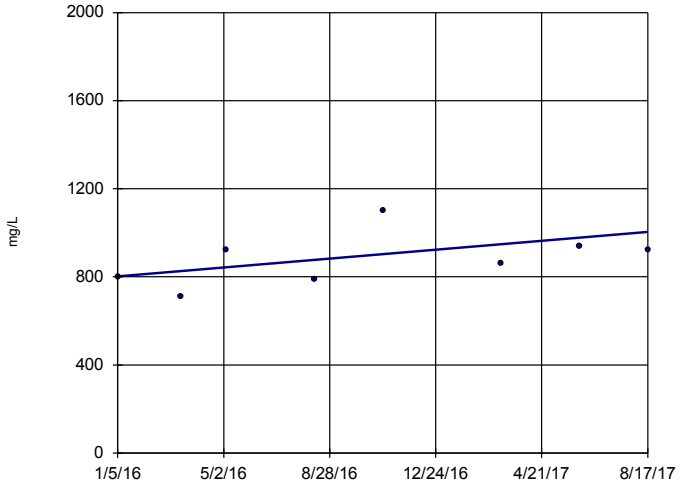
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sulfate

MW-5A



n = 8

Slope = 125.4 units per year.

Mann-Kendall statistic = 11 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

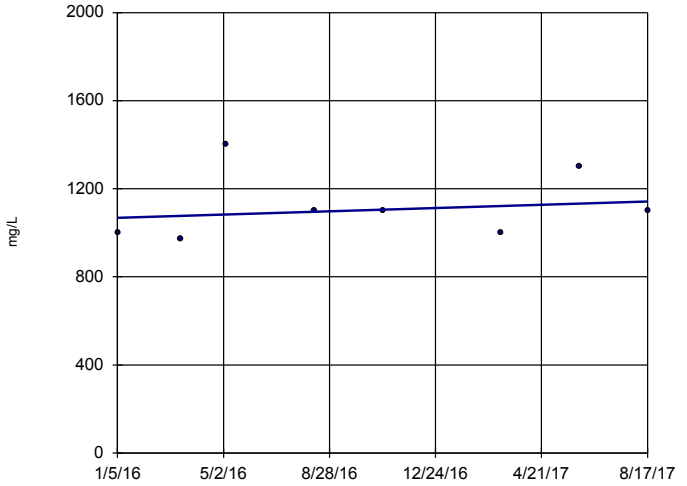
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6



n = 8

Slope = 46.31 units per year.

Mann-Kendall statistic = 6 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

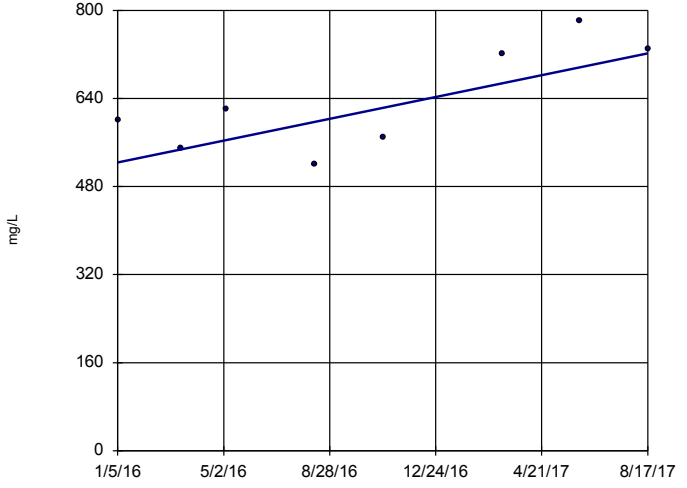
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6A



n = 8

Slope = 122.7 units per year.

Mann-Kendall statistic = 14 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

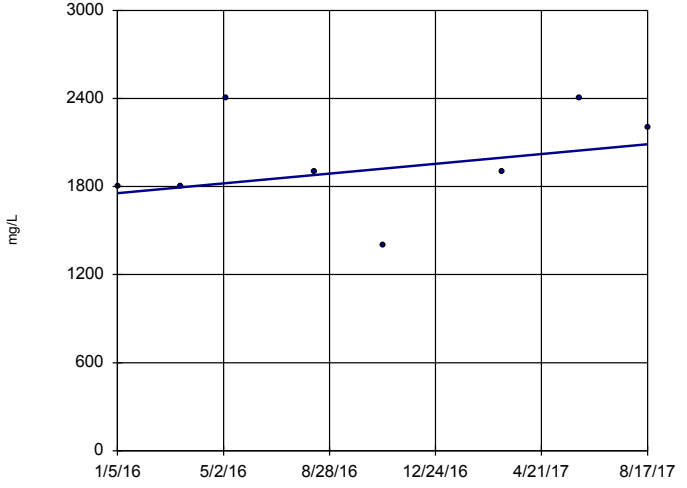
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-7



n = 8

Slope = 206.6 units per year.

Mann-Kendall statistic = 9 critical = 20

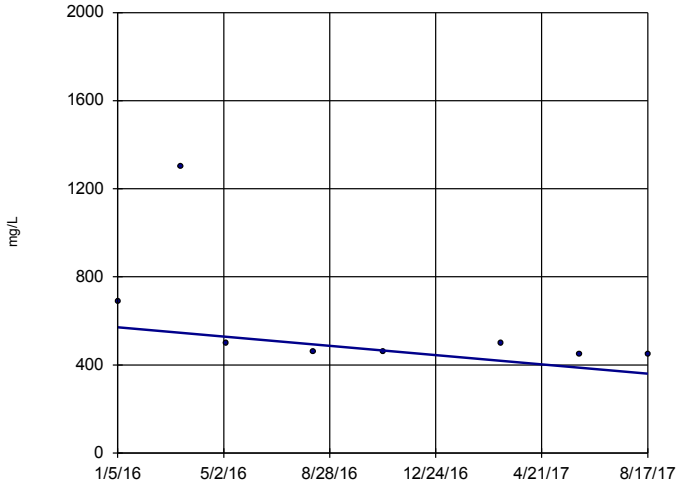
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-2 (bg)



n = 8

Slope = -130.2 units per year.

Mann-Kendall statistic = -19 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

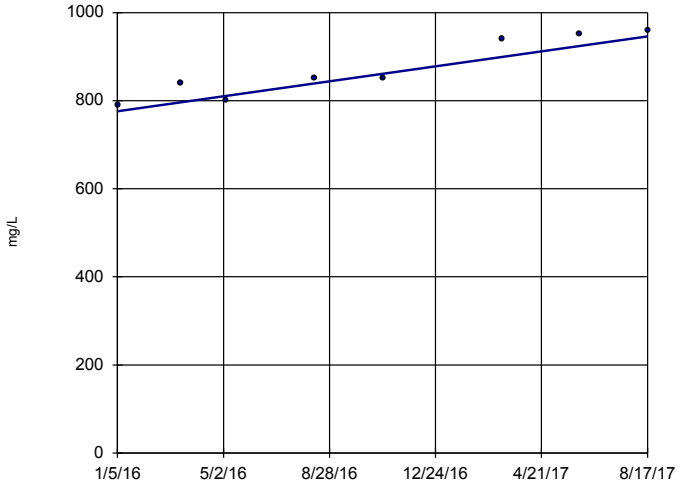
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-3 (bg)



n = 8

Slope = 105 units per year.

Mann-Kendall statistic = 25 critical = 20

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

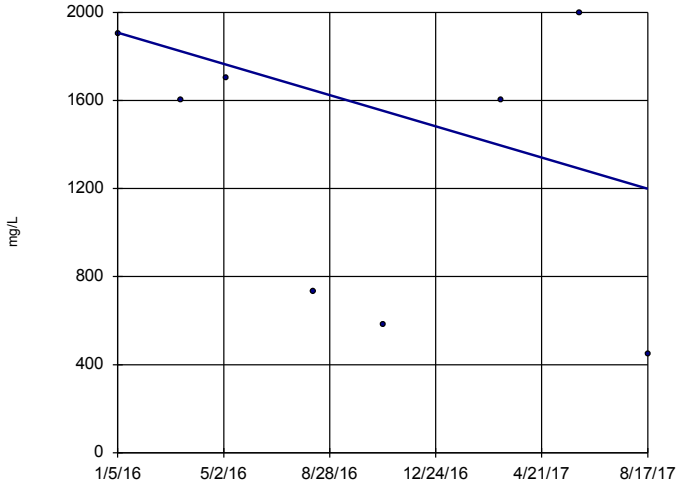
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-4



n = 8

Slope = -439 units per year.

Mann-Kendall statistic = -9 critical = -20

Trend not significant at 98% confidence level (α = 0.01 per tail).

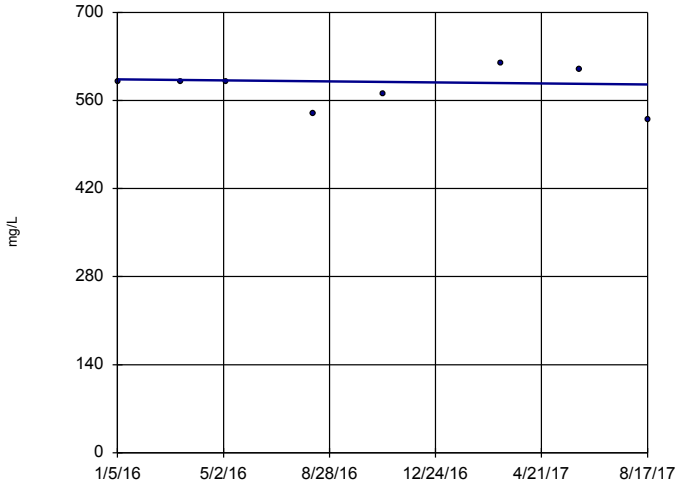
Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Sanitas™ v.9.5.32 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-5



n = 8

Slope = -4.906 units per year.

Mann-Kendall statistic = -3 critical = -20

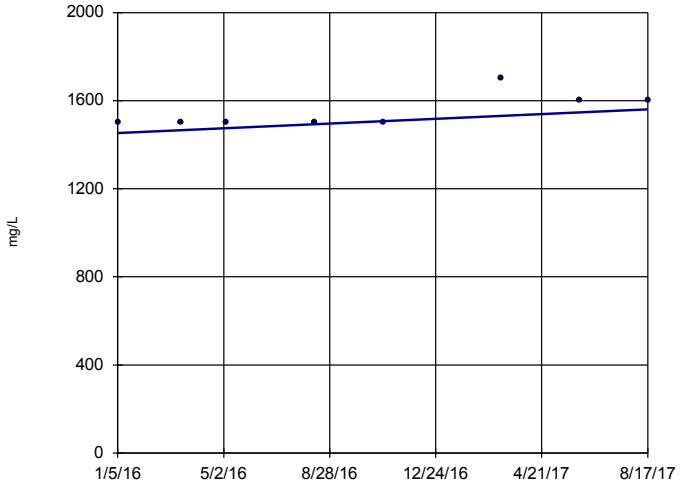
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:08 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-5A



n = 8

Slope = 66.1 units per year.

Mann-Kendall statistic = 13 critical = 20

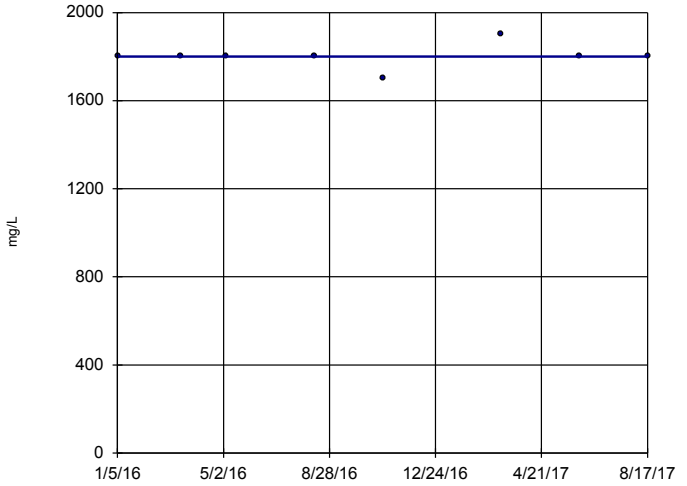
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-6



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 1 critical = 20

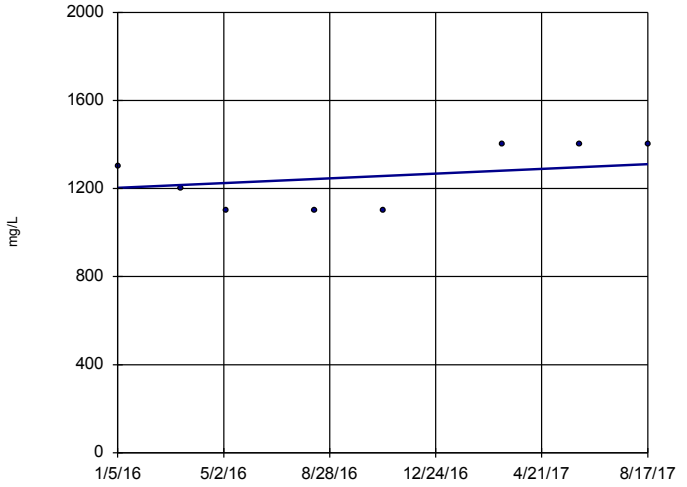
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-6A



n = 8

Slope = 66.44 units per year.

Mann-Kendall statistic = 8 critical = 20

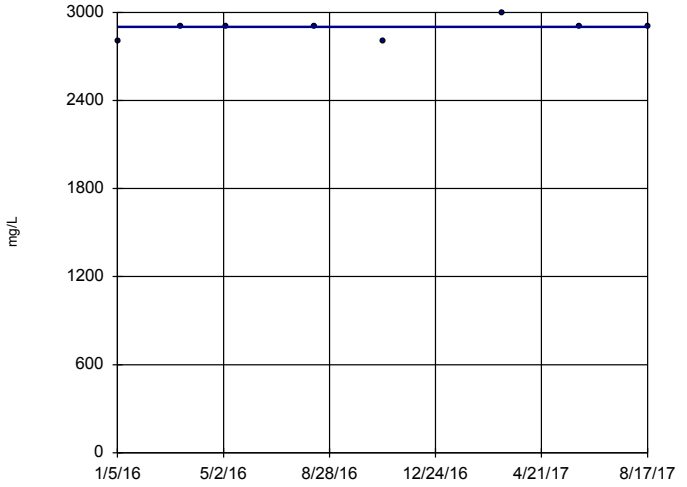
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Total Dissolved Solids

MW-7



n = 8

Slope = 0 units per year.

Mann-Kendall statistic = 7 critical = 20

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 1/23/2018 3:09 PM

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3

Trend Test

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3 only Printed 1/23/2018, 3:10 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-2 (bg)	-0.08868	-16	-20	No	8	0	n/a	n/a	0.02	NP
Boron (mg/L)	**MW-3 (bg)**	**-0.01797**	**-21**	**-20**	**Yes**	**8**	**50**	**n/a**	**n/a**	**0.02**	**NP**
Boron (mg/L)	MW-4	0	-1	-20	No	8	62.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5	0	0	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5A	0.03993	18	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6	0.06117	14	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6A	0.08497	19	20	No	8	12.5	n/a	n/a	0.02	NP
Boron (mg/L)	MW-7	0	2	20	No	8	12.5	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2 (bg)	-0.8333	-2	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3 (bg)	15.6	18	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4	-36.95	-6	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5	-4.395	-3	-20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5A	16.74	10	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6	7.67	8	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6A	25.16	12	20	No	8	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-7	-5.401	0	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2 (bg)	0	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3 (bg)	-24.13	-20	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4	-27.17	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5	0.3955	10	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5A	-5.487	-8	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6	1.735	14	20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6A	-9.402	-10	-20	No	8	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-7	3.19	7	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2 (bg)	-0.02016	-8	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3 (bg)	-0.1295	-16	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4	-0.00...	0	20	No	8	12.5	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5	-0.0291	-4	-20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5A	0.08456	15	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6	0.00928	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6A	0.03022	4	20	No	8	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-7	0.06113	13	20	No	8	12.5	n/a	n/a	0.02	NP
pH (SU)	MW-2 (bg)	0.2618	8	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-3 (bg)	0.01982	2	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-4	0.2307	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-5	0.05967	4	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-5A	0.0211	1	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-6	0.2471	14	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-6A	0.08386	7	20	No	8	0	n/a	n/a	0.02	NP
pH (SU)	MW-7	0.04935	4	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2 (bg)	-110.6	-20	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3 (bg)	126.8	19	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4	-379.2	-8	-20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5	0	5	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5A	125.4	11	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6	46.31	6	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6A	122.7	14	20	No	8	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-7	206.6	9	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-2 (bg)	-130.2	-19	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	**MW-3 (bg)**	**105**	**25**	**20**	**Yes**	**8**	**0**	**n/a**	**n/a**	**0.02**	**NP**

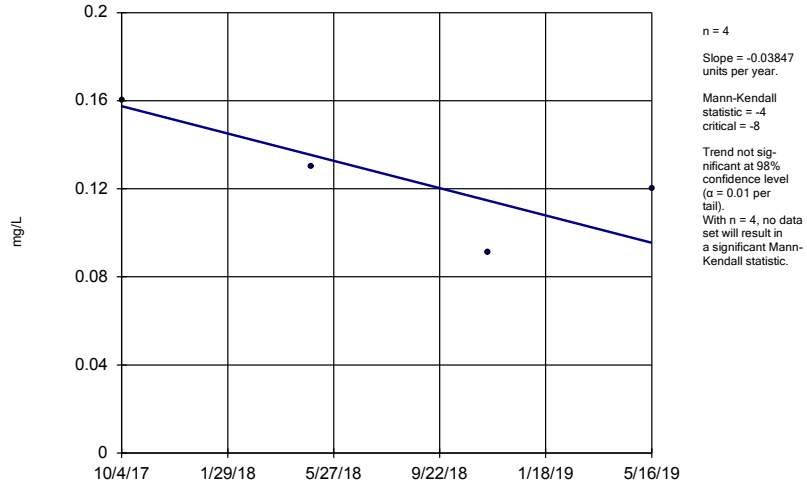
Trend Test

The Empire District Client: Midwest Environmental Consultants Data: Asbury CCR Impoundments GW Baseline Database - App 3 only Printed 1/23/2018, 3:10 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Total Dissolved Solids (mg/L)	MW-4	-439	-9	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5	-4.906	-3	-20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5A	66.1	13	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6	0	1	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6A	66.44	8	20	No	8	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-7	0	7	20	No	8	0	n/a	n/a	0.02	NP

Boron

MW-2 (bg)



n = 4

Slope = -0.03847 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

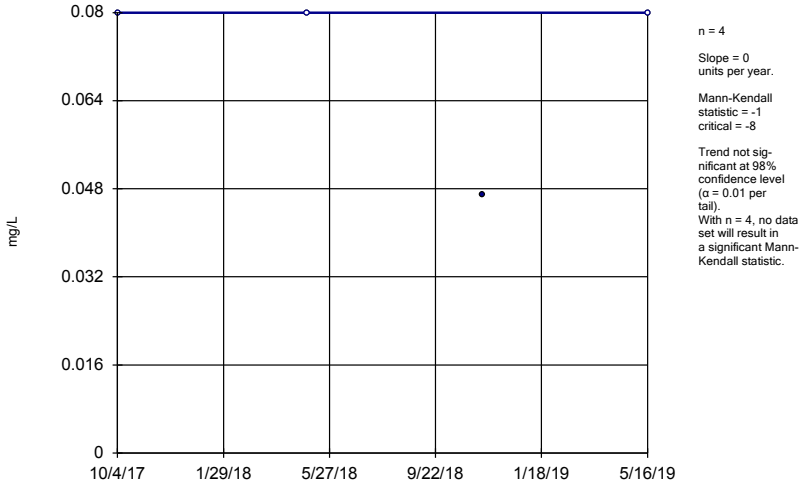
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Boron

MW-3 (bg)



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = -1
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Boron

MW-4

n = 4

Slope = 0 units per year.

Mann-Kendall statistic = -1
critical = -8

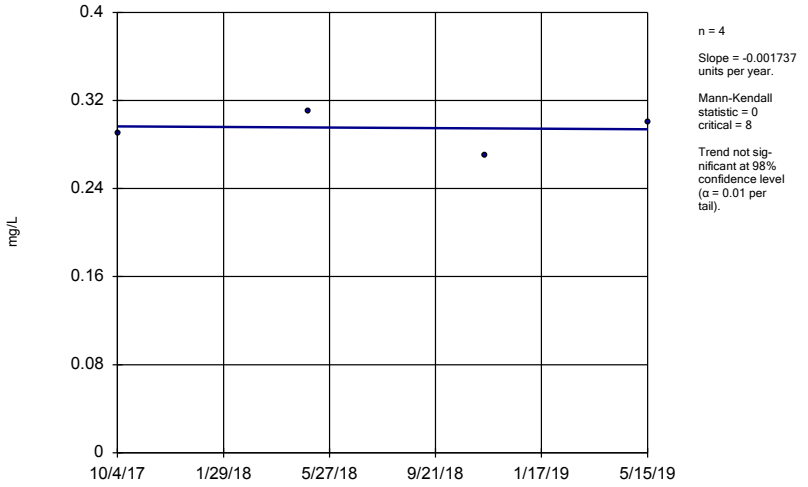
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Boron

MW-5



n = 4

Slope = -0.001737 units per year.

Mann-Kendall statistic = 0
critical = 8

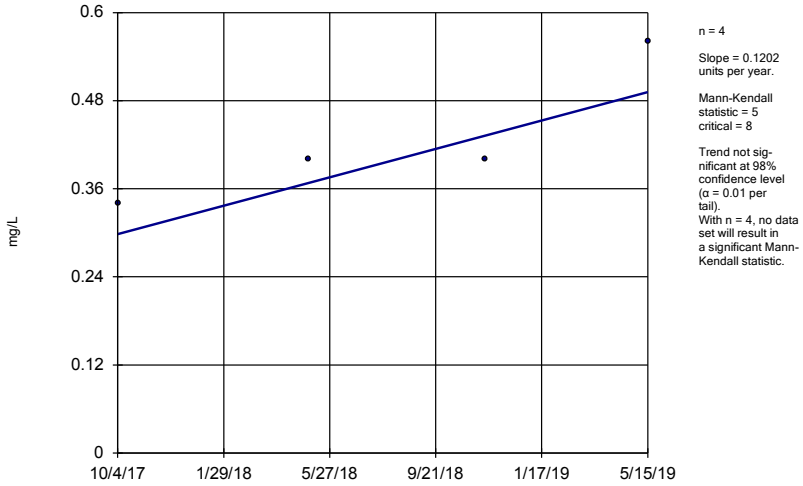
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Boron

MW-5A



n = 4

Slope = 0.1202 units per year.

Mann-Kendall statistic = 5
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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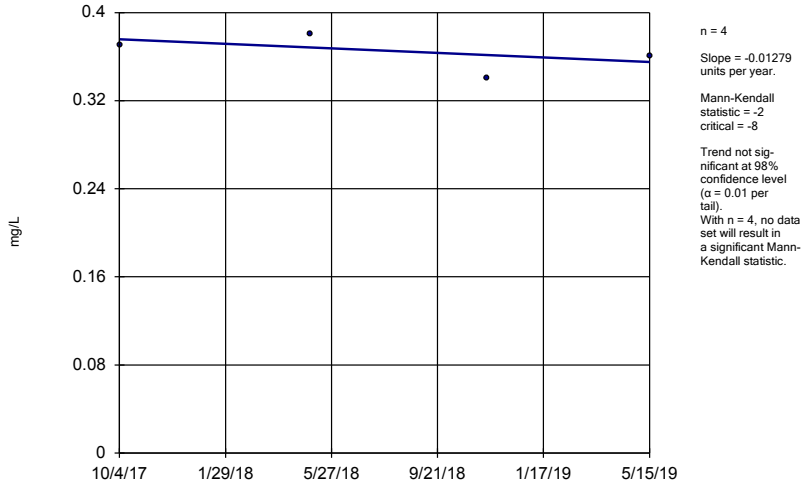
Boron

MW-6



n = 4

Slope = -0.01279 units per year.

Mann-Kendall statistic = -2
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

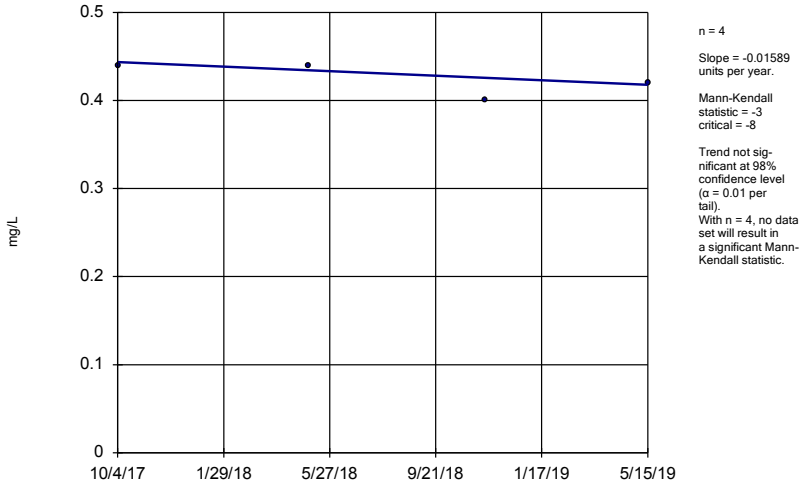
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Boron

MW-6A



n = 4

Slope = -0.01589 units per year.

Mann-Kendall statistic = -3
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

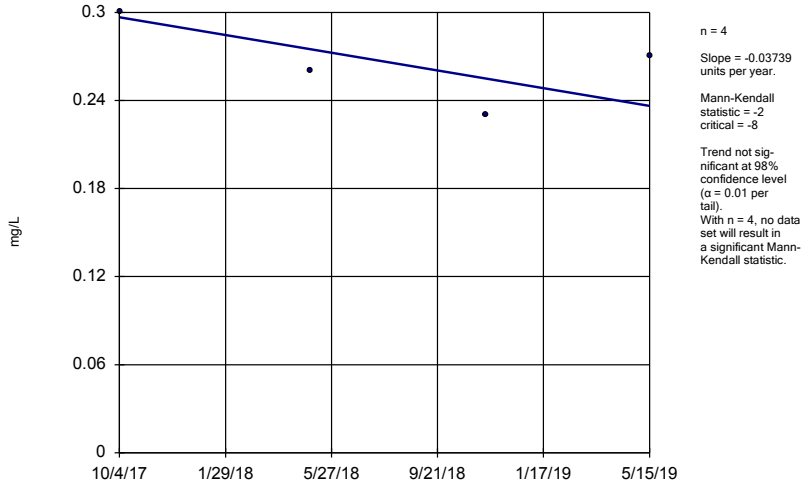
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Boron

MW-7 (bg)



n = 4

Slope = -0.03739 units per year.

Mann-Kendall statistic = -2
critical = -8

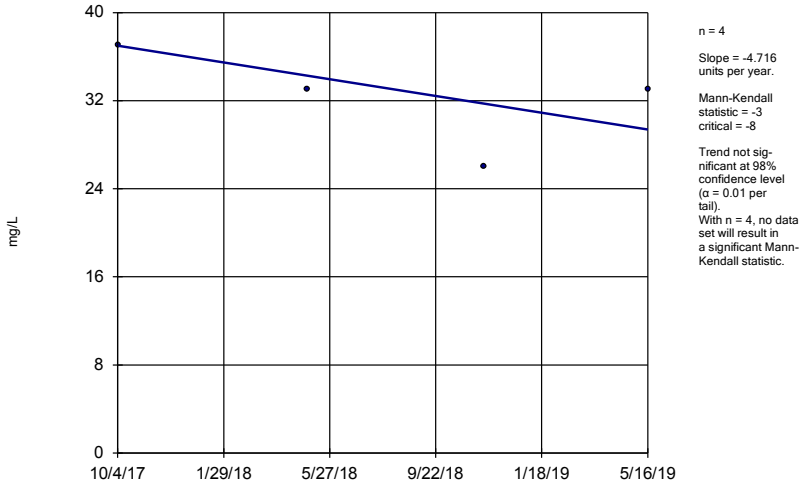
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Calcium

MW-2 (bg)



n = 4

Slope = -4.716 units per year.

Mann-Kendall statistic = -3
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

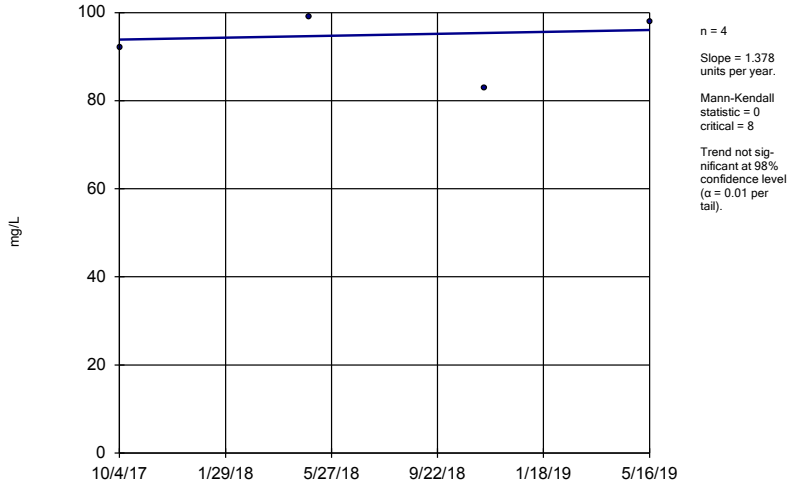
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Calcium

MW-3 (bg)



n = 4

Slope = 1.378 units per year.

Mann-Kendall statistic = 0
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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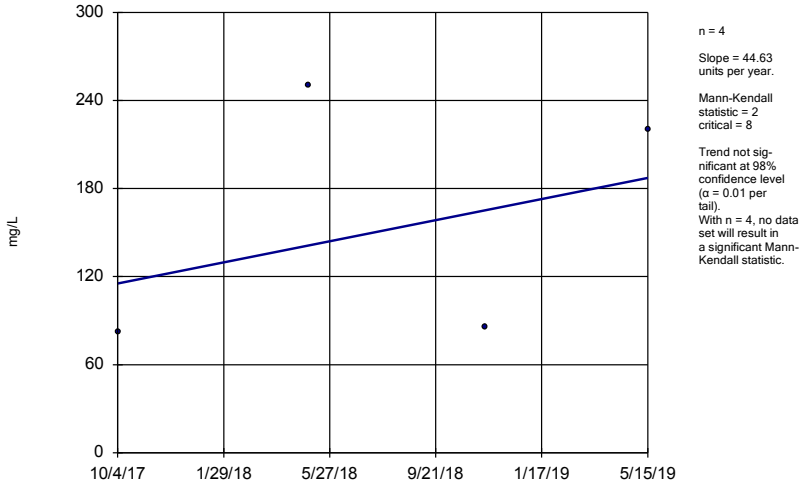
Calcium

MW-4



n = 4

Slope = 44.63 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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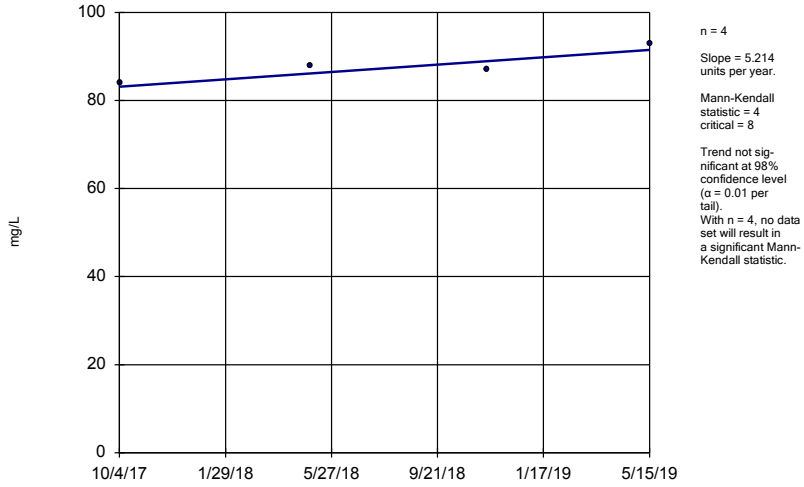
Calcium

MW-5



n = 4

Slope = 5.214 units per year.

Mann-Kendall statistic = 4
critical = 8

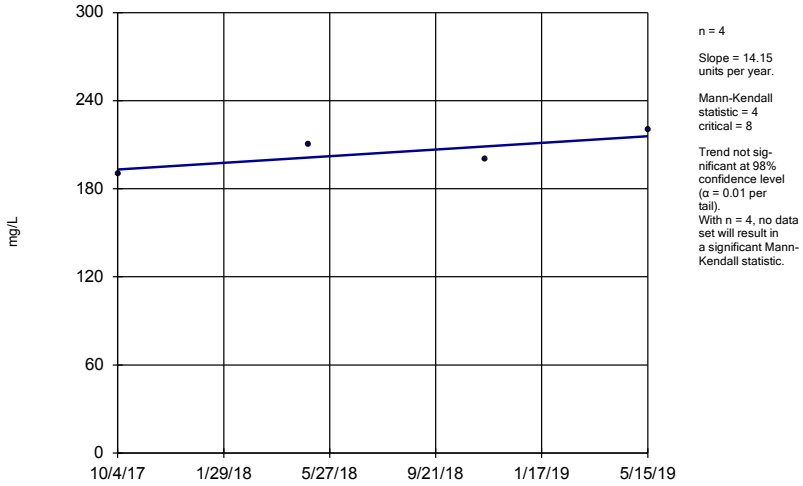
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Calcium

MW-5A



n = 4

Slope = 14.15 units per year.

Mann-Kendall statistic = 4
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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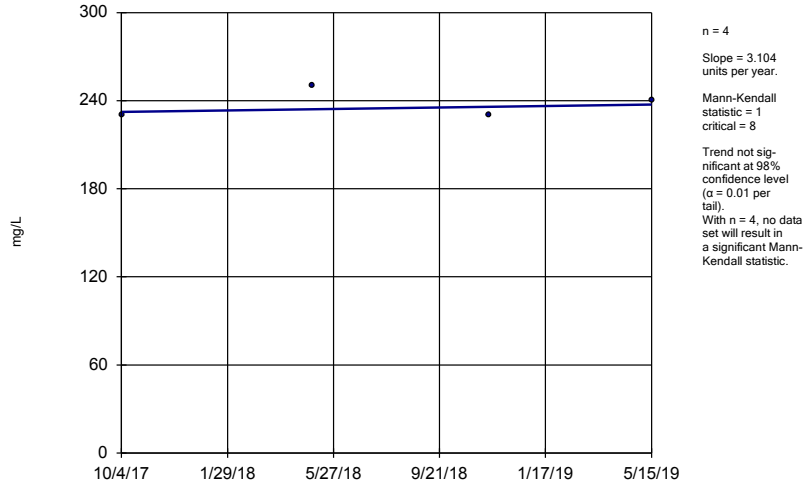
Calcium

MW-6



n = 4

Slope = 3.104 units per year.

Mann-Kendall statistic = 1
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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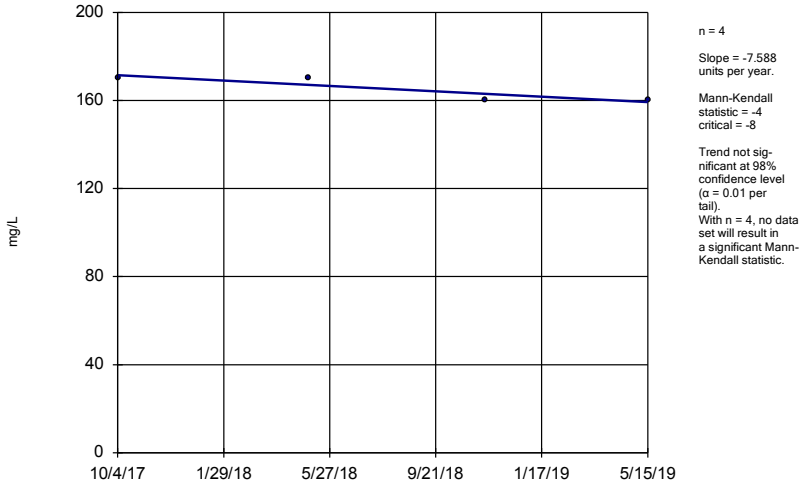
Calcium

MW-6A



n = 4

Slope = -7.588 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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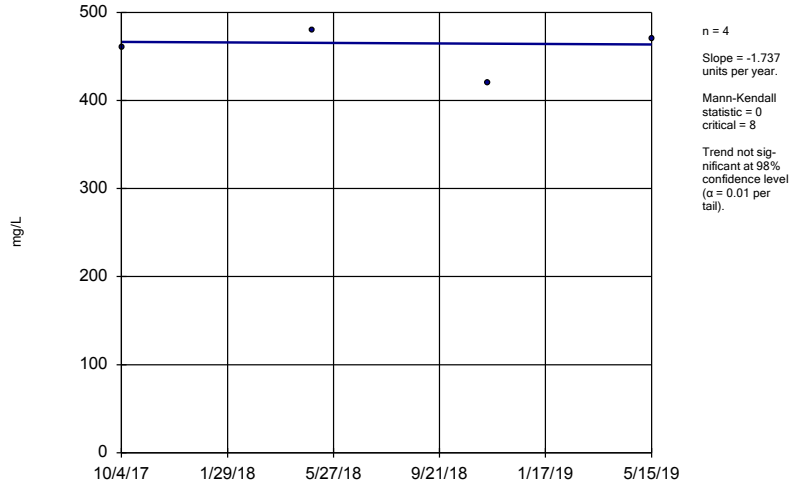
Calcium

MW-7 (bg)



n = 4

Slope = -1.737 units per year.

Mann-Kendall statistic = 0
critical = 8

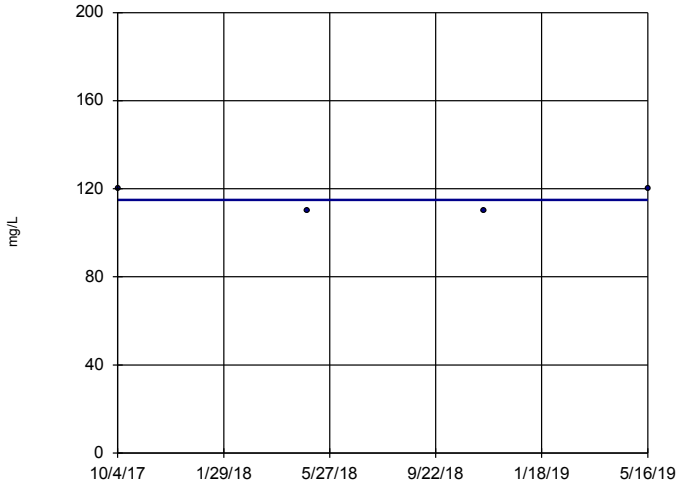
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Chloride

MW-2 (bg)



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = 0 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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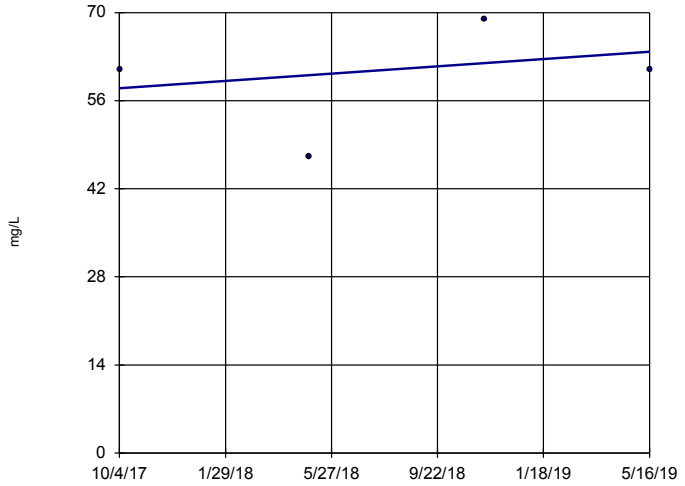
Chloride

MW-3 (bg)



n = 4

Slope = 3.596 units per year.

Mann-Kendall statistic = 1 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

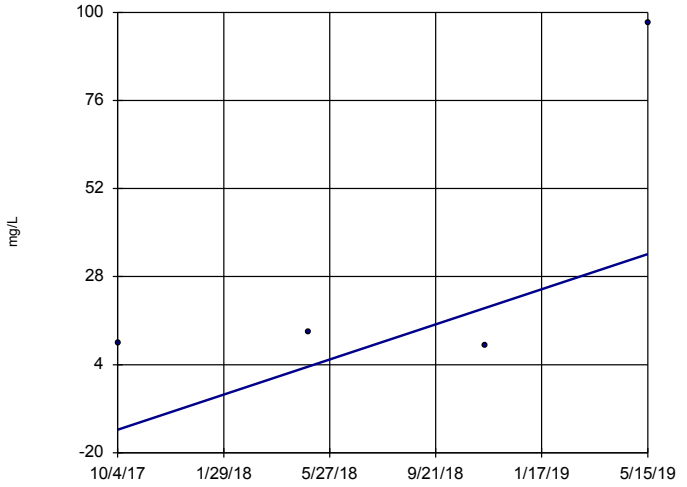
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Chloride

MW-4



n = 4

Slope = 29.71 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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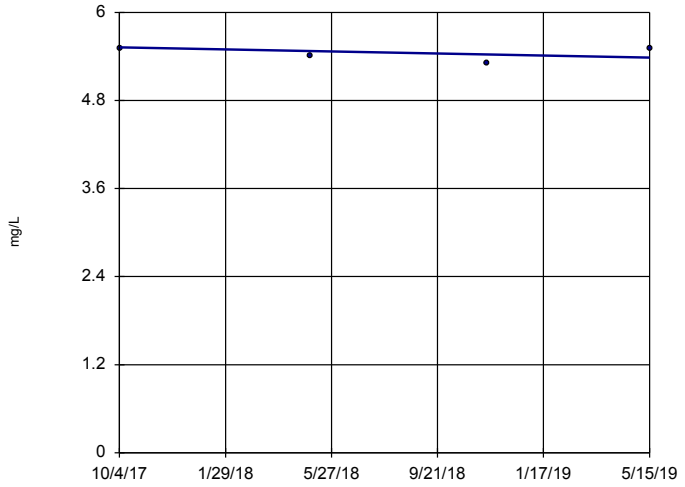
Chloride

MW-5



n = 4

Slope = -0.08649 units per year.

Mann-Kendall statistic = -1 critical = -8

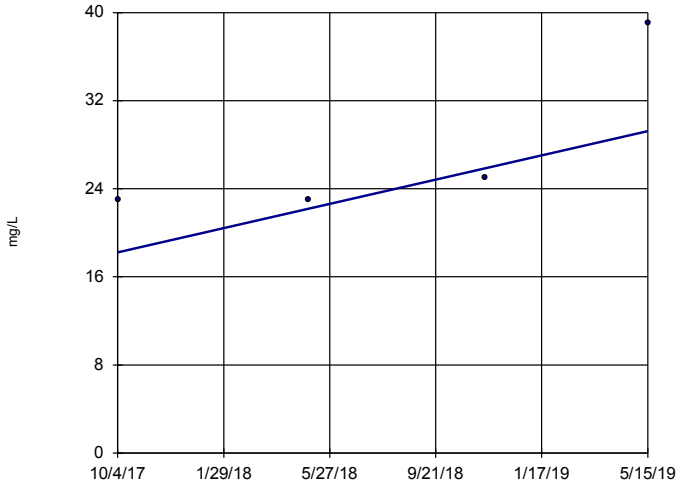
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Chloride

MW-5A



n = 4

Slope = 6.828 units per year.

Mann-Kendall statistic = 5 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

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The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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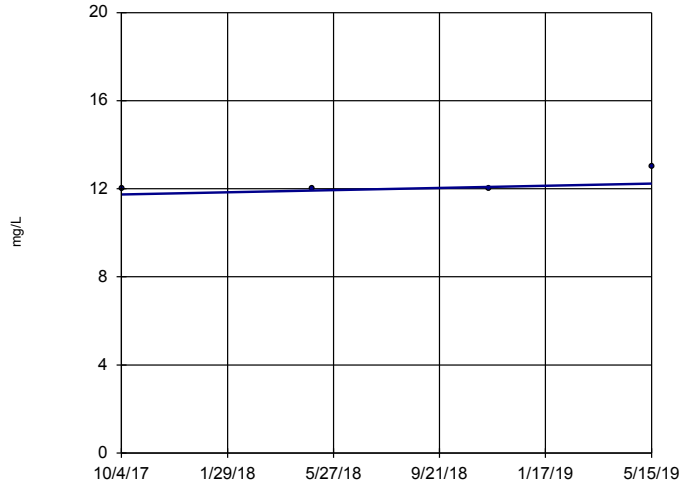
Chloride

MW-6



n = 4

Slope = 0.3104 units per year.

Mann-Kendall statistic = 3 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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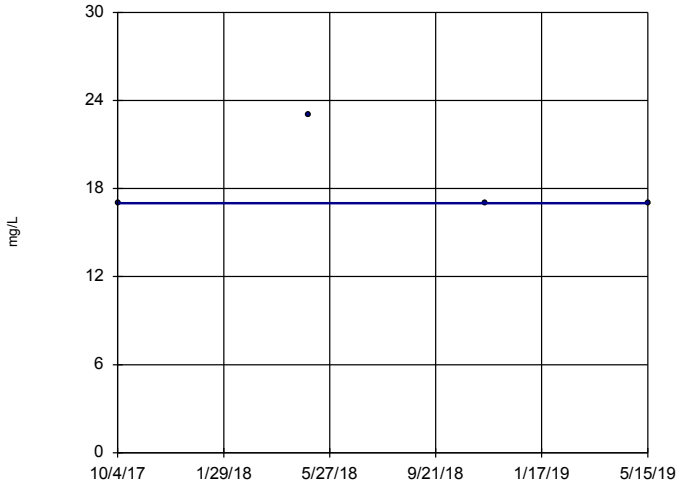
Chloride

MW-6A



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = -1 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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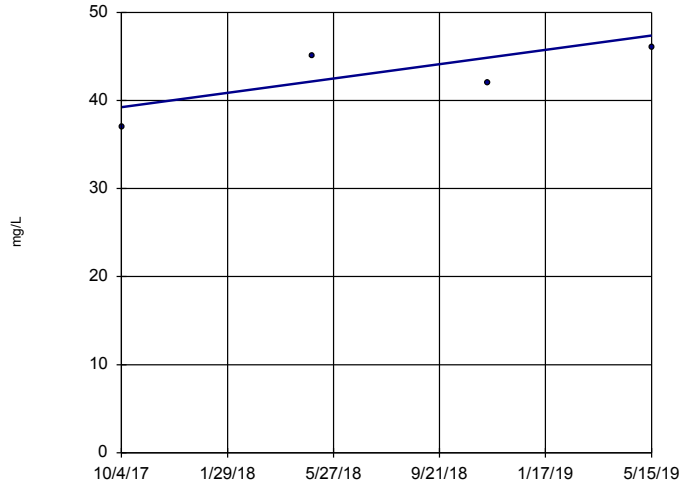
Chloride

MW-7 (bg)



n = 4

Slope = 5.041 units per year.

Mann-Kendall statistic = 4 critical = 8

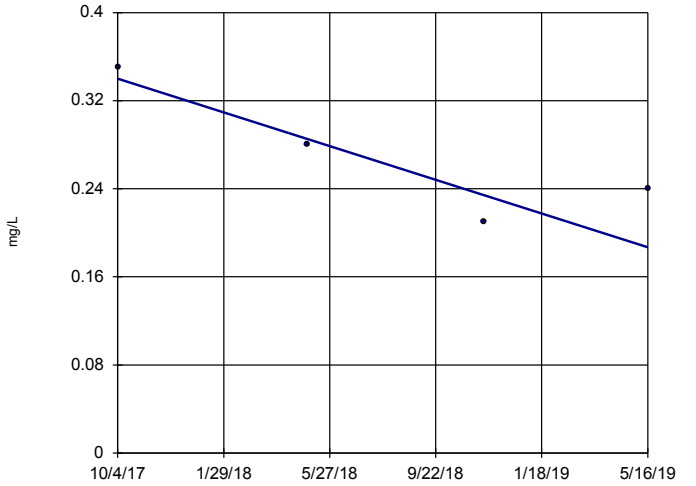
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Fluoride

MW-2 (bg)



n = 4

Slope = -0.09492 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

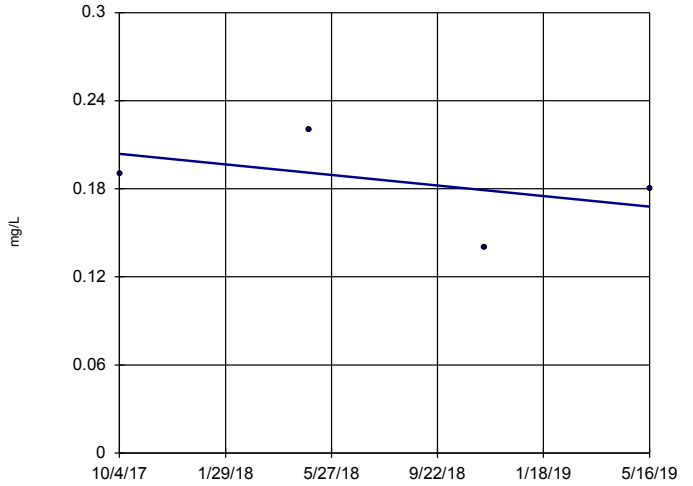
Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Fluoride

MW-3 (bg)



n = 4

Slope = -0.02236 units per year.

Mann-Kendall statistic = -2
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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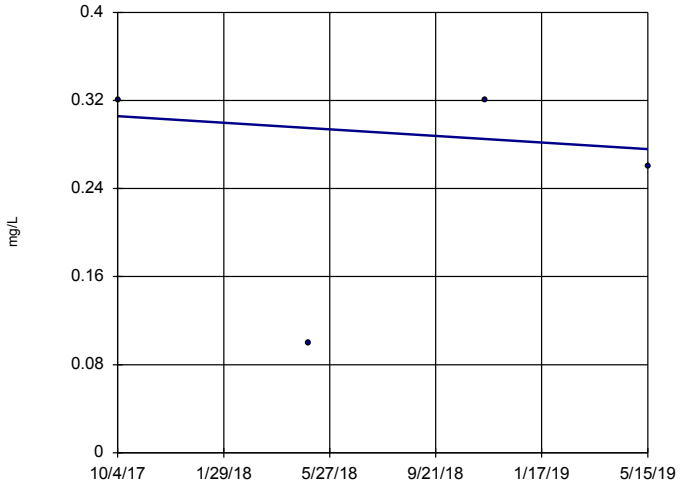
Fluoride

MW-4



n = 4

Slope = -0.01862 units per year.

Mann-Kendall statistic = -1
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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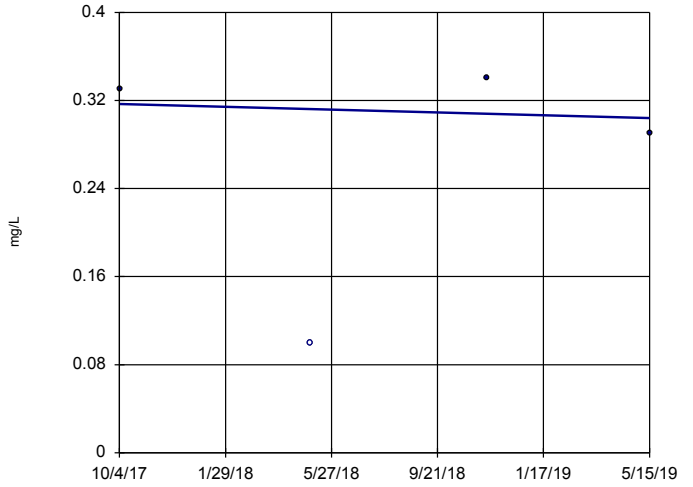
Hollow symbols indicate censored values.

Fluoride

MW-5



n = 4

Slope = -0.007931 units per year.

Mann-Kendall statistic = 0
critical = 8

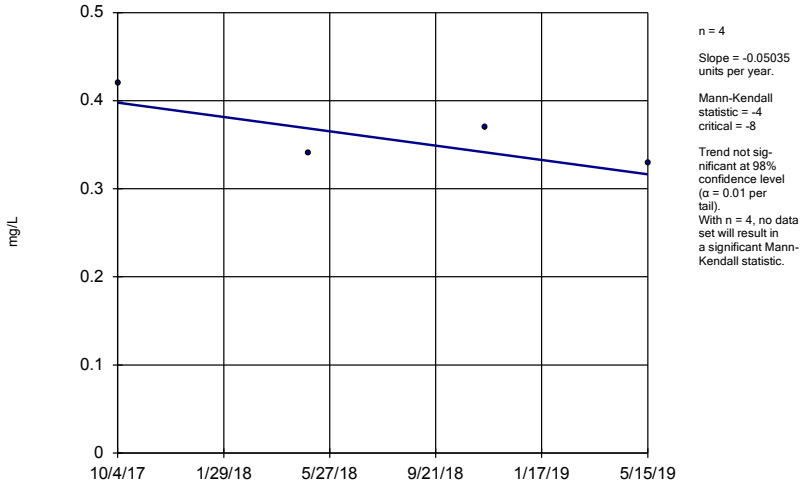
Trend not significant at 98% confidence level (α = 0.01 per tail).

Sen's Slope Estimator Analysis Run 12/4/2019 2:11 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Fluoride

MW-5A



n = 4

Slope = -0.05035 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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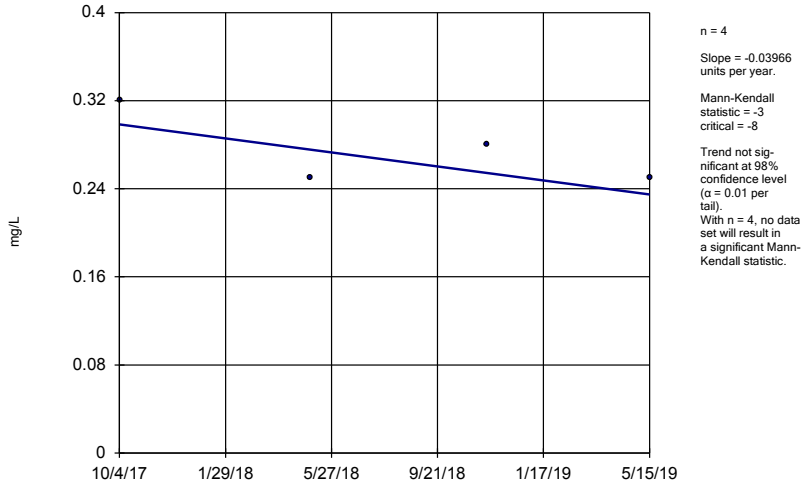
Fluoride

MW-6



n = 4

Slope = -0.03966 units per year.

Mann-Kendall statistic = -3
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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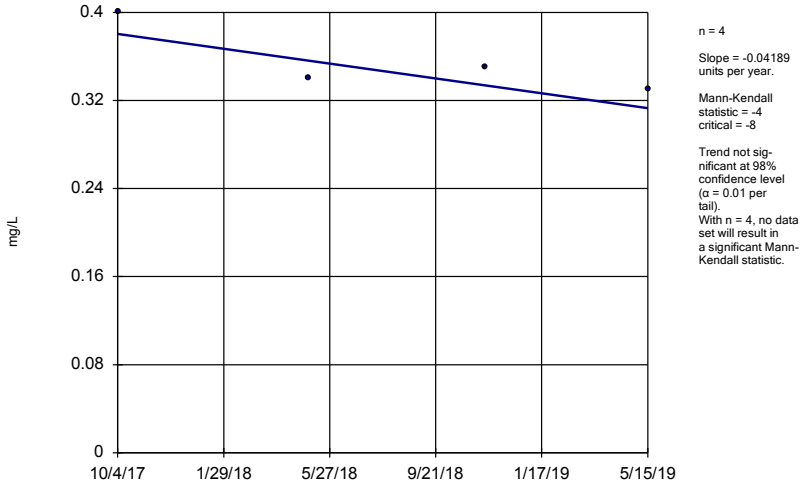
Fluoride

MW-6A



n = 4

Slope = -0.04189 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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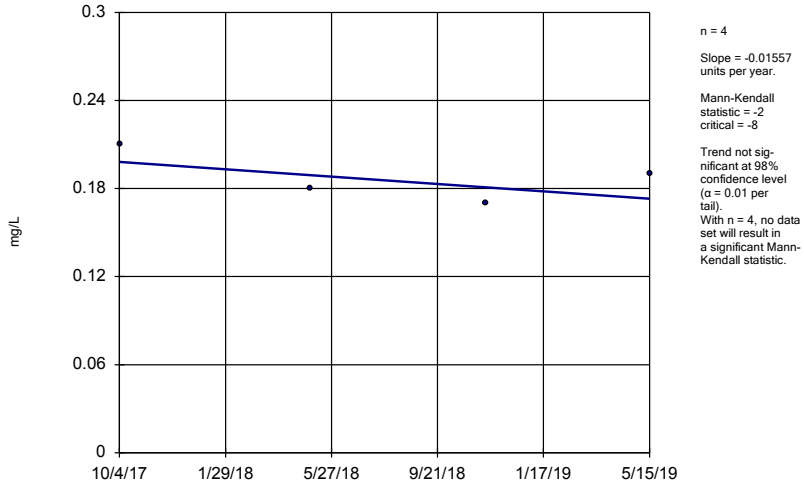
Fluoride

MW-7 (bg)



n = 4

Slope = -0.01557 units per year.

Mann-Kendall statistic = -2
critical = -8

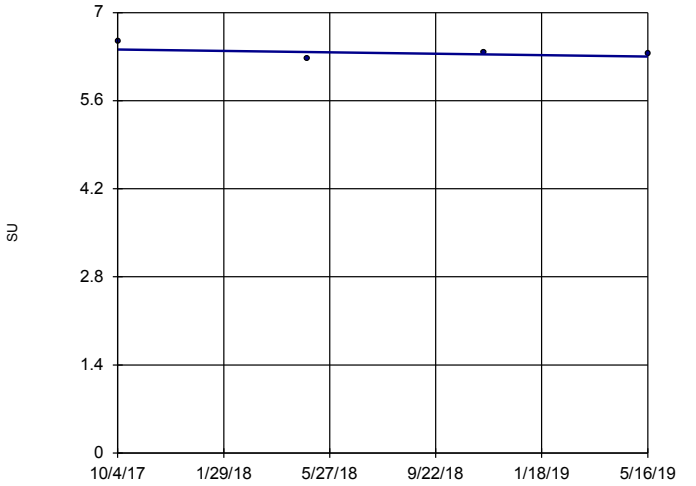
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

pH

MW-2 (bg)



n = 4

Slope = -0.0689 units per year.

Mann-Kendall statistic = -2 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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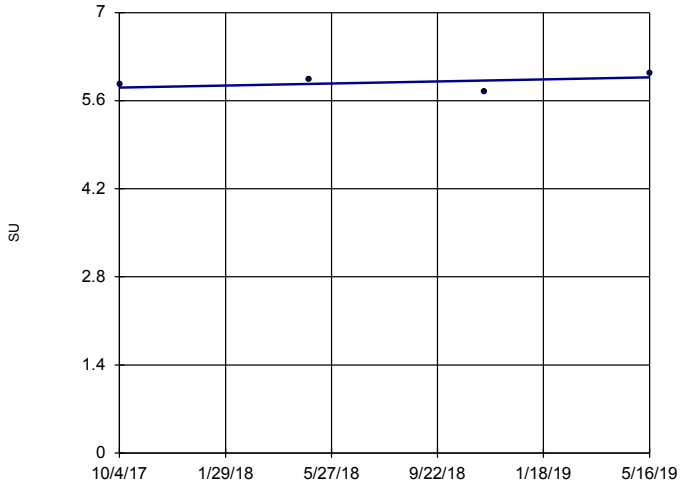
pH

MW-3 (bg)



n = 4

Slope = 0.1008 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

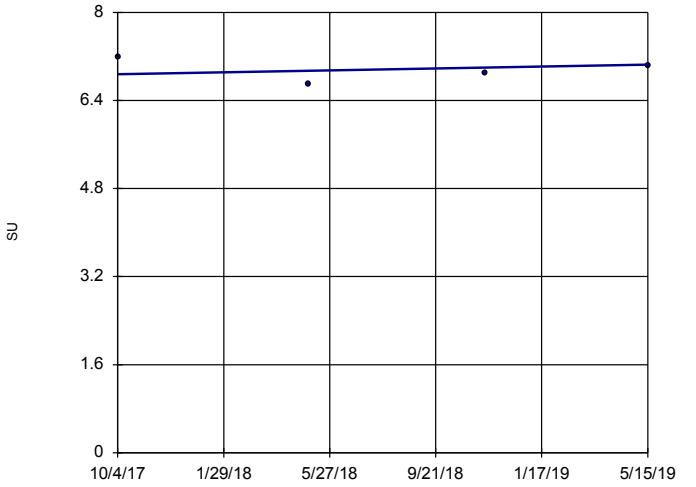
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-4



n = 4

Slope = 0.1078 units per year.

Mann-Kendall statistic = 0 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).

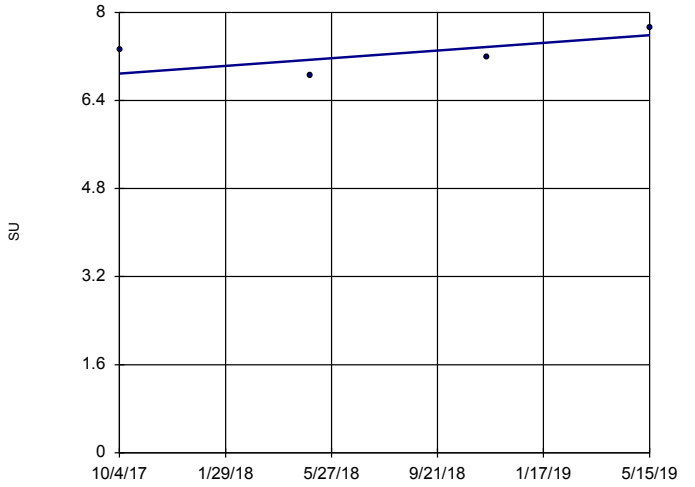
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-5



n = 4

Slope = 0.4345 units per year.

Mann-Kendall statistic = 2 critical = 8

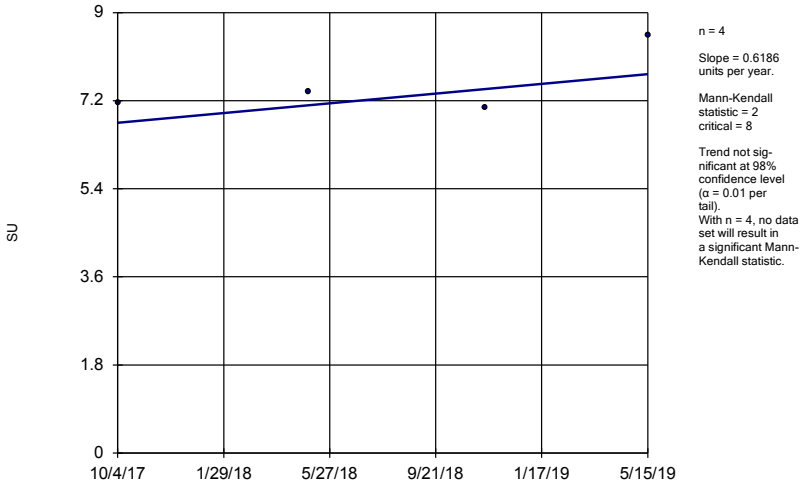
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

pH

MW-5A



n = 4

Slope = 0.6186 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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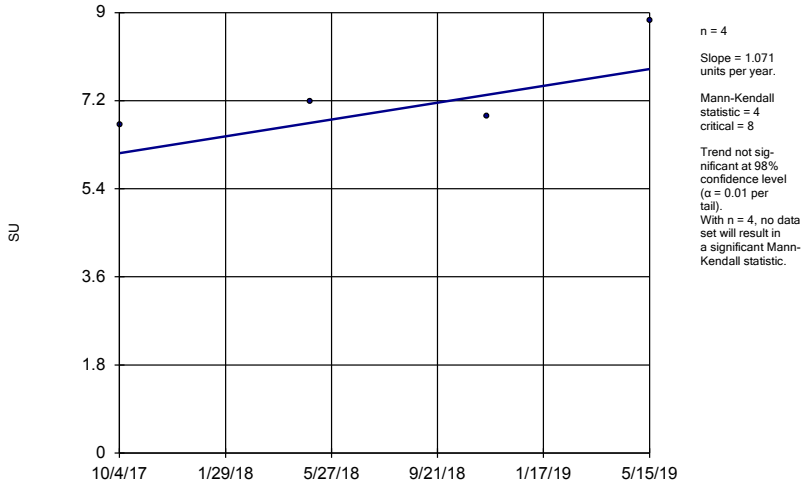
pH

MW-6



n = 4

Slope = 1.071 units per year.

Mann-Kendall statistic = 4 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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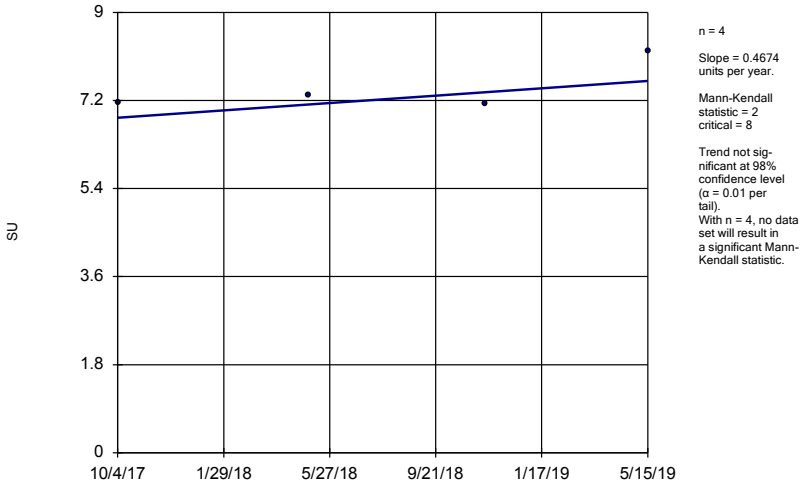
pH

MW-6A



n = 4

Slope = 0.4674 units per year.

Mann-Kendall statistic = 2 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

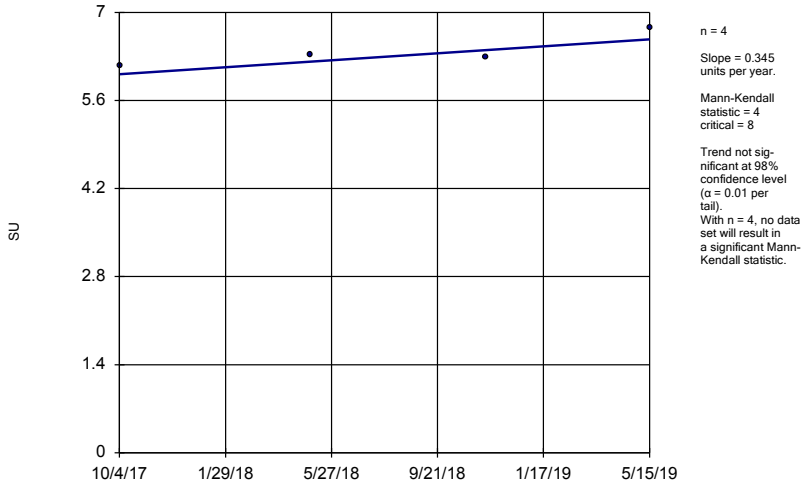
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

pH

MW-7 (bg)



n = 4

Slope = 0.345 units per year.

Mann-Kendall statistic = 4 critical = 8

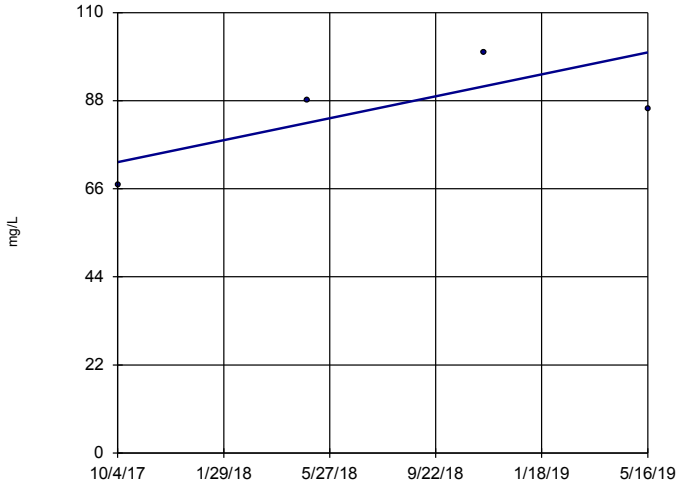
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sulfate

MW-2 (bg)



n = 4

Slope = 17 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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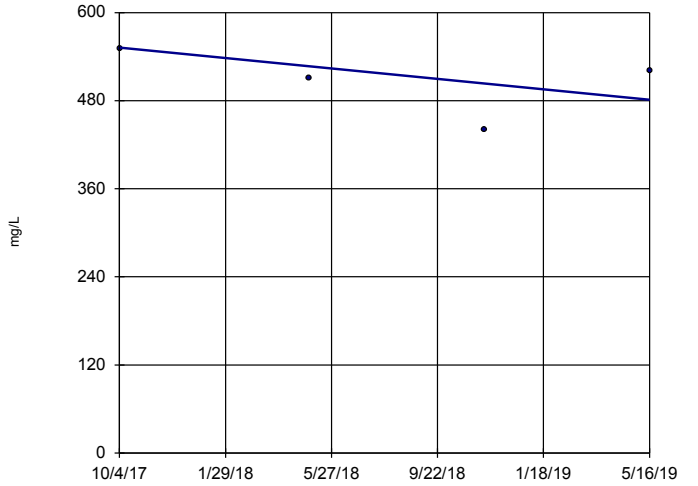
Sulfate

MW-3 (bg)



n = 4

Slope = -44.06 units per year.

Mann-Kendall statistic = -2
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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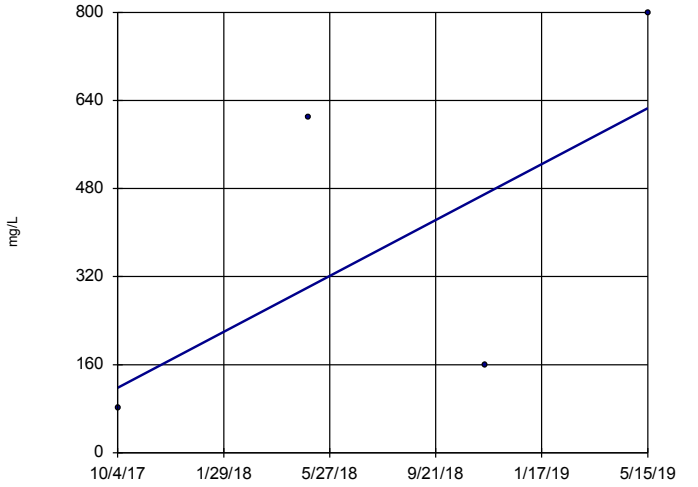
Sulfate

MW-4



n = 4

Slope = 315.1 units per year.

Mann-Kendall statistic = 4
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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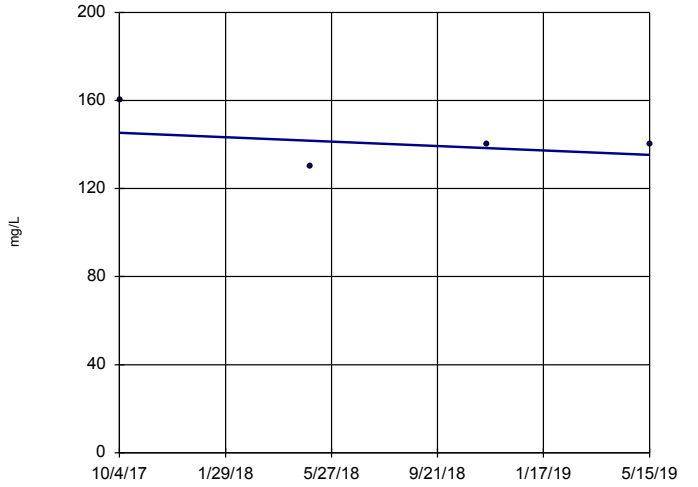
Sulfate

MW-5



n = 4

Slope = -6.207 units per year.

Mann-Kendall statistic = -1
critical = -8

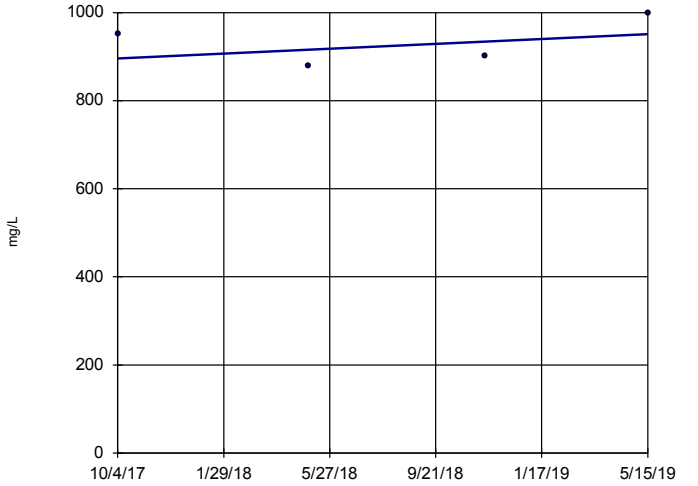
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sulfate

MW-5A



n = 4

Slope = 34.14 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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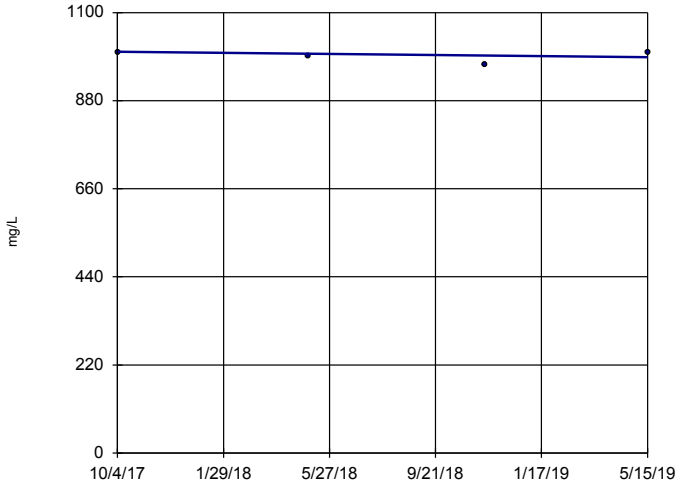
Sulfate

MW-6



n = 4

Slope = -8.649 units per year.

Mann-Kendall statistic = -1
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

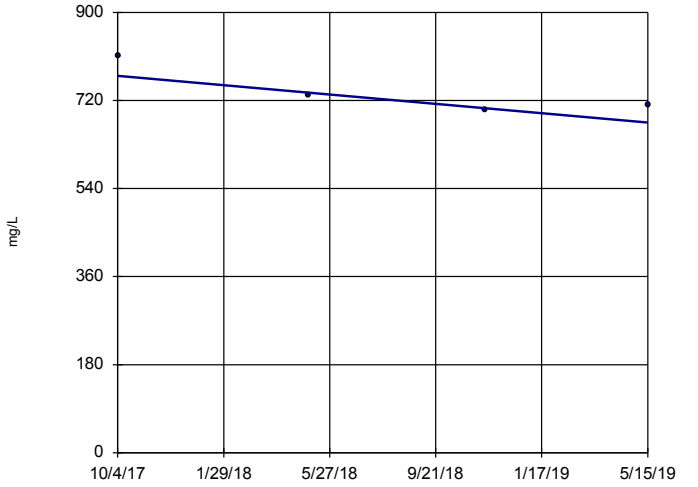
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-6A



n = 4

Slope = -58.97 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

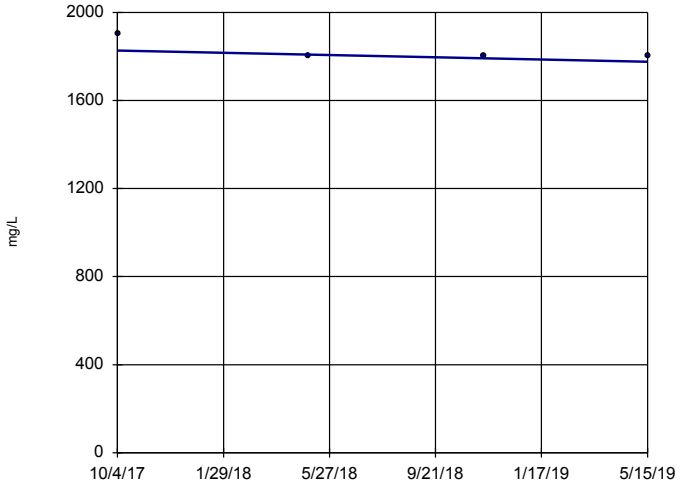
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Sulfate

MW-7 (bg)



n = 4

Slope = -31.04 units per year.

Mann-Kendall statistic = -3
critical = -8

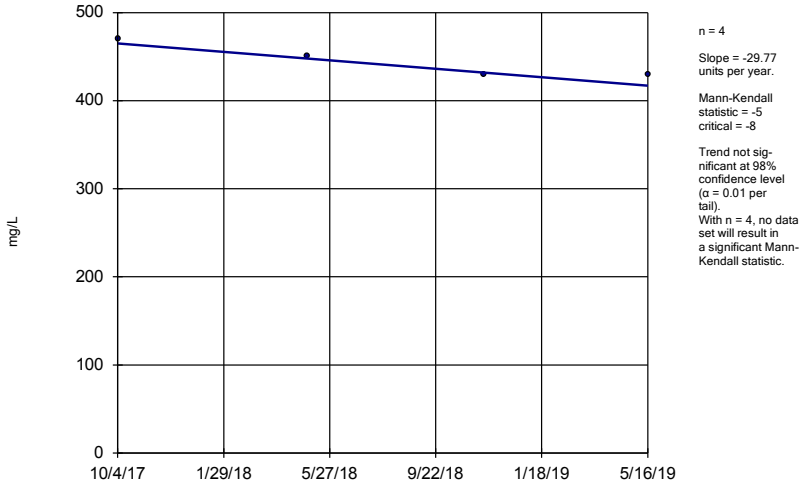
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Total Dissolved Solids

MW-2 (bg)



n = 4

Slope = -29.77 units per year.

Mann-Kendall statistic = -5
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

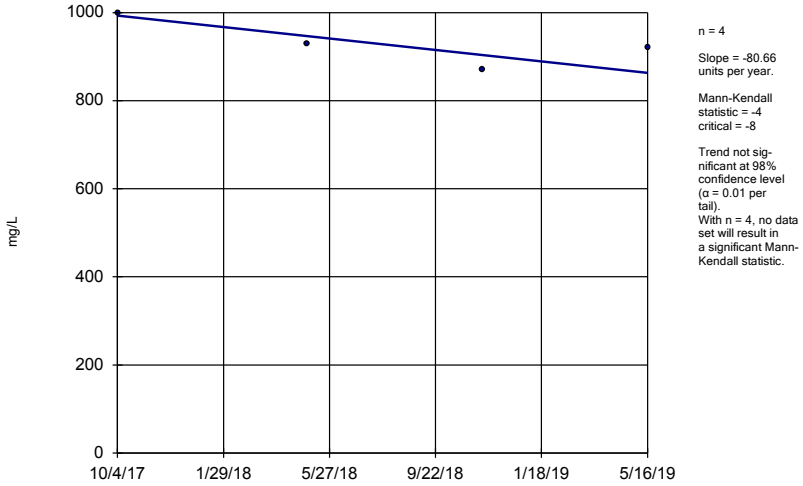
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-3 (bg)



n = 4

Slope = -80.66 units per year.

Mann-Kendall statistic = -4
critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

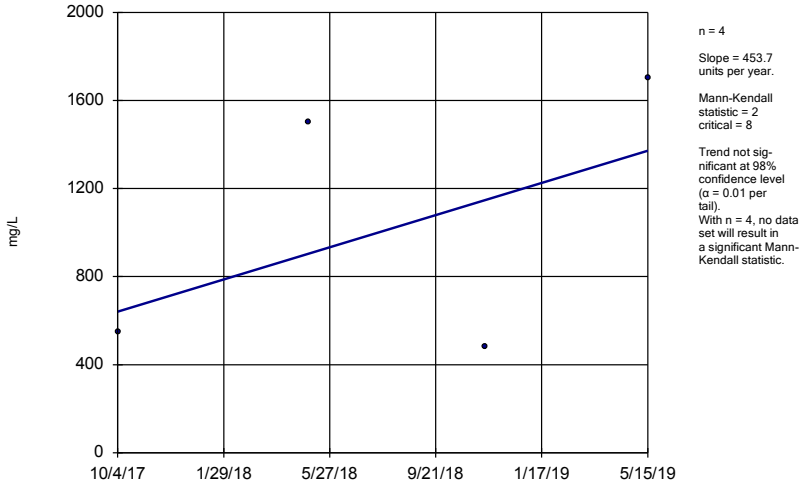
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-4



n = 4

Slope = 453.7 units per year.

Mann-Kendall statistic = 2
critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

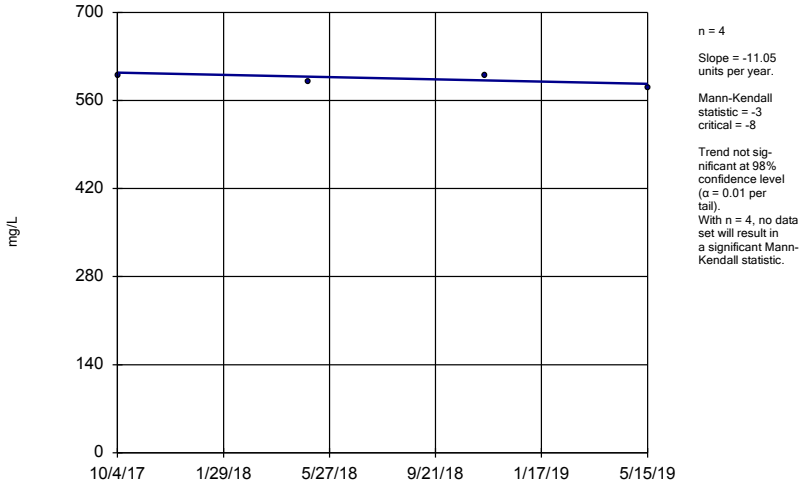
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-5



n = 4

Slope = -11.05 units per year.

Mann-Kendall statistic = -3
critical = -8

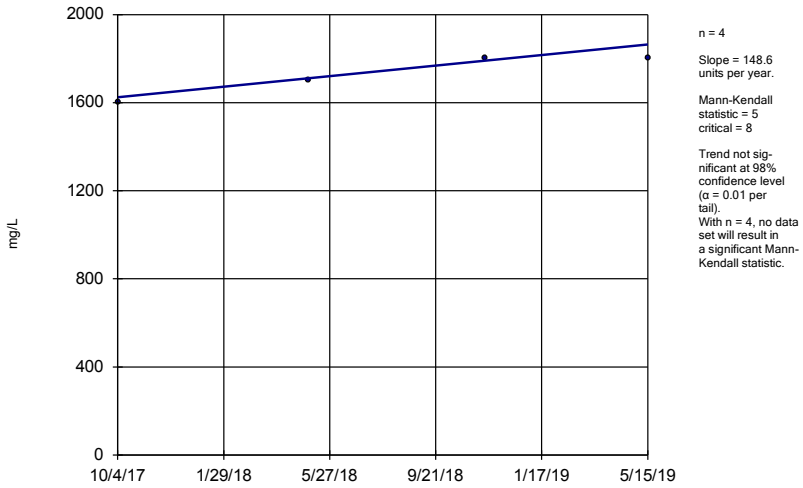
Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Total Dissolved Solids

MW-5A



n = 4

Slope = 148.6 units per year.

Mann-Kendall statistic = 5 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

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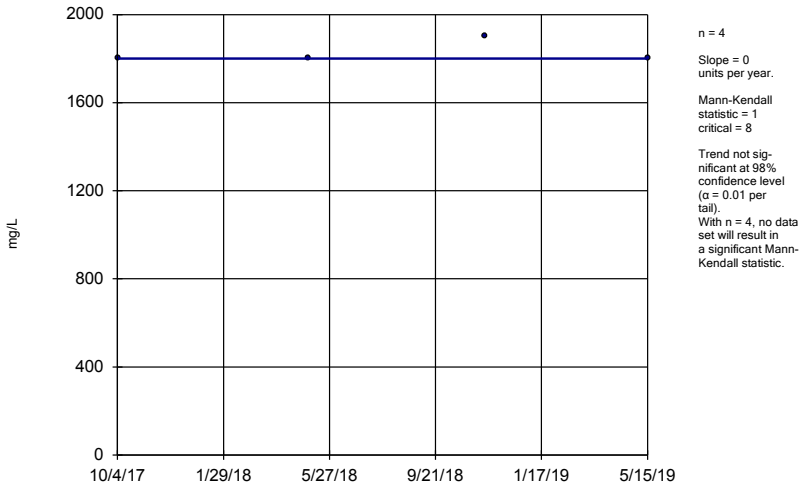
Total Dissolved Solids

MW-6



n = 4

Slope = 0 units per year.

Mann-Kendall statistic = 1 critical = 8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

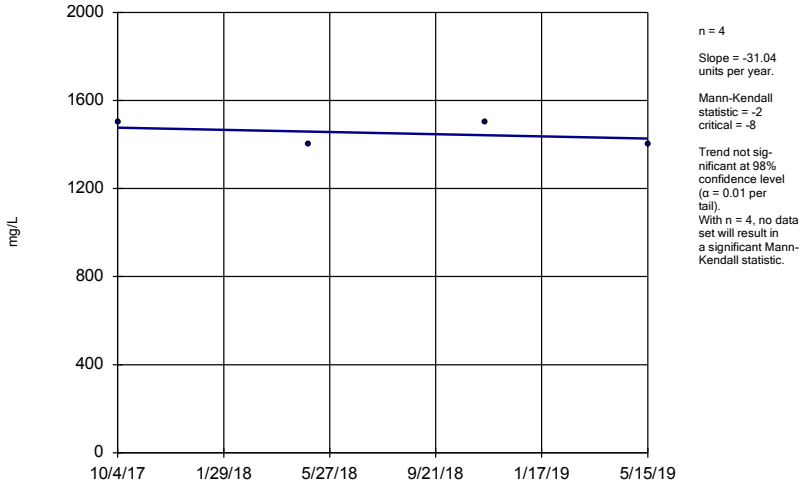
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-6A



n = 4

Slope = -31.04 units per year.

Mann-Kendall statistic = -2 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

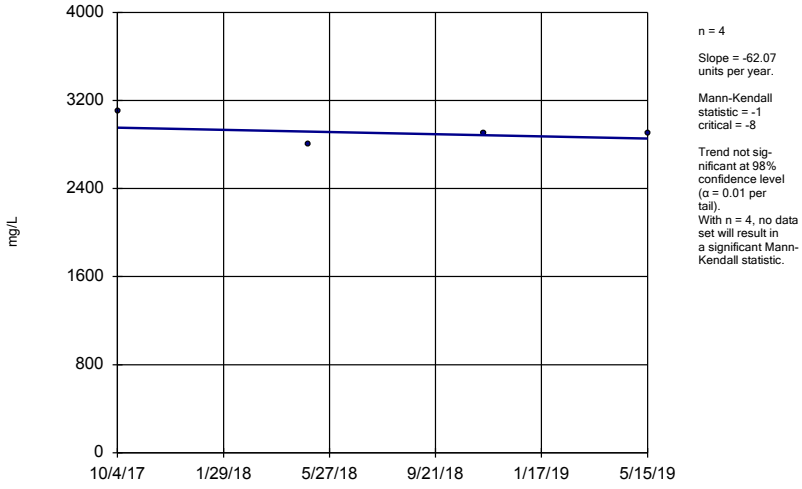
Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Sanitas™ v.9.6.23 Sanitas software licensed to Midwest Environmental Consultants. UG

Total Dissolved Solids

MW-7 (bg)



n = 4

Slope = -62.07 units per year.

Mann-Kendall statistic = -1 critical = -8

Trend not significant at 98% confidence level (α = 0.01 per tail).
With n = 4, no data set will result in a significant Mann-Kendall statistic.

Sen's Slope Estimator Analysis Run 12/4/2019 2:12 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background

Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background Printed 12/4/2019, 2:13 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Boron (mg/L)	MW-2 (bg)	-0.03847	-4	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3 (bg)	0	-1	-8	No	4	75	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4	0	-1	-8	No	4	75	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5	-0.00...	0	8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5A	0.1202	5	8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6	-0.01279	-2	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-6A	-0.01589	-3	-8	No	4	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-7 (bg)	-0.03739	-2	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2 (bg)	-4.716	-3	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3 (bg)	1.378	0	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4	44.63	2	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5	5.214	4	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5A	14.15	4	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6	3.104	1	8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-6A	-7.588	-4	-8	No	4	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-7 (bg)	-1.737	0	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2 (bg)	0	0	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3 (bg)	3.596	1	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4	29.71	2	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5	-0.08649	-1	-8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5A	6.828	5	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6	0.3104	3	8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-6A	0	-1	-8	No	4	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-7 (bg)	5.041	4	8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2 (bg)	-0.09492	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3 (bg)	-0.02236	-2	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4	-0.01862	-1	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5	-0.00...	0	8	No	4	25	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5A	-0.05035	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6	-0.03966	-3	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-6A	-0.04189	-4	-8	No	4	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-7 (bg)	-0.01557	-2	-8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-2 (bg)	-0.0689	-2	-8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-3 (bg)	0.1008	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-4	0.1078	0	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-5	0.4345	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-5A	0.6186	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-6	1.071	4	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-6A	0.4674	2	8	No	4	0	n/a	n/a	0.02	NP
pH (SU)	MW-7 (bg)	0.345	4	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2 (bg)	17	2	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3 (bg)	-44.06	-2	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4	315.1	4	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5	-6.207	-1	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5A	34.14	2	8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6	-8.649	-1	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-6A	-58.97	-4	-8	No	4	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-7 (bg)	-31.04	-3	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-2 (bg)	-29.77	-5	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-3 (bg)	-80.66	-4	-8	No	4	0	n/a	n/a	0.02	NP

Trend Test

The Empire District Client: Midwest Environmental Consultants Data: 11-19 App 3 Asbury ponds with background Printed 12/4/2019, 2:13 PM

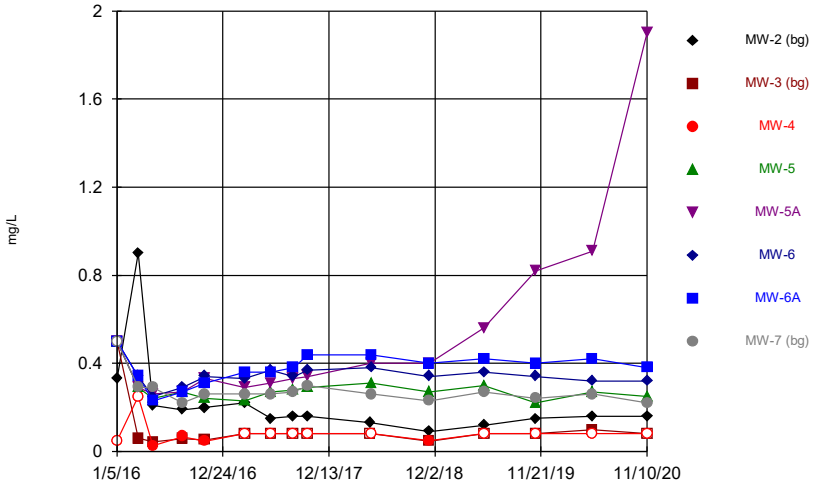
Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Total Dissolved Solids (mg/L)	MW-4	453.7	2	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5	-11.05	-3	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5A	148.6	5	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6	0	1	8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-6A	-31.04	-2	-8	No	4	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-7 (bg)	-62.07	-1	-8	No	4	0	n/a	n/a	0.02	NP

Sanitas™ Output – Sampling Event

Time Series Analysis

Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

Boron



Time Series Analysis Run 12/2/2020 1:29 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

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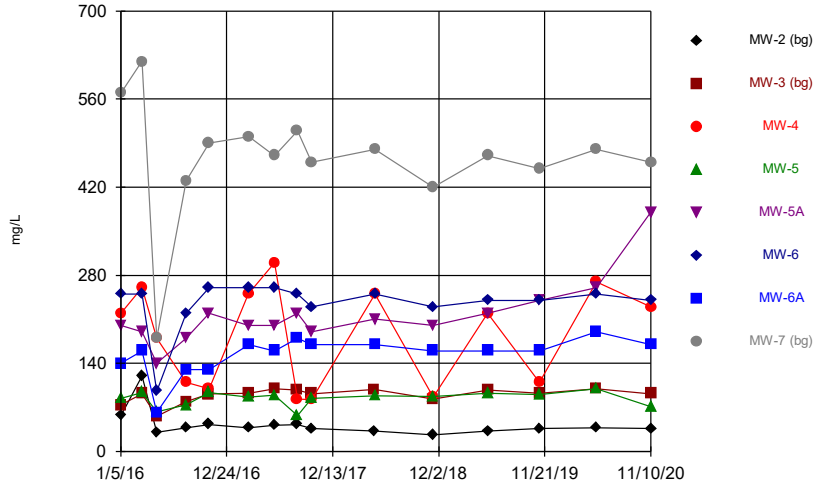
Calcium



Time Series Analysis Run 12/2/2020 1:29 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

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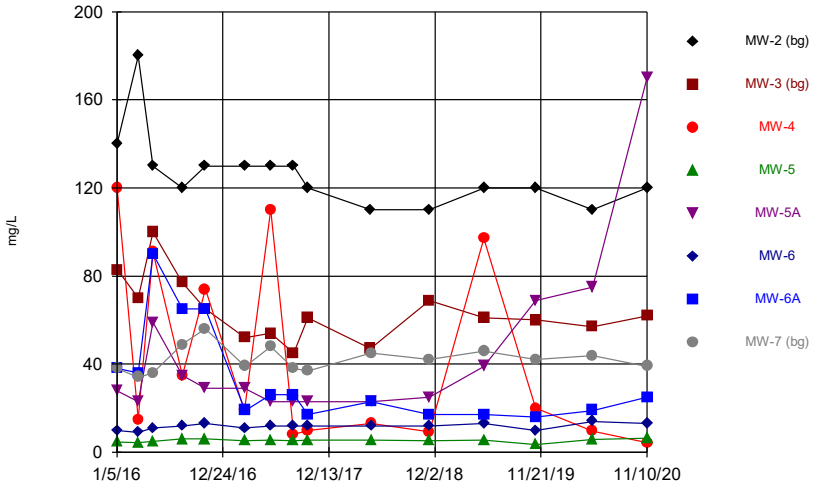
Chloride

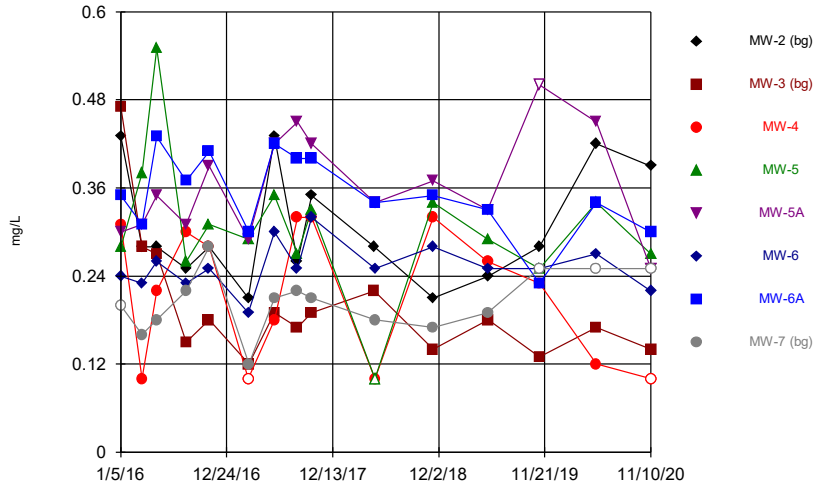


Time Series Analysis Run 12/2/2020 1:29 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG
Hollow symbols indicate censored values.

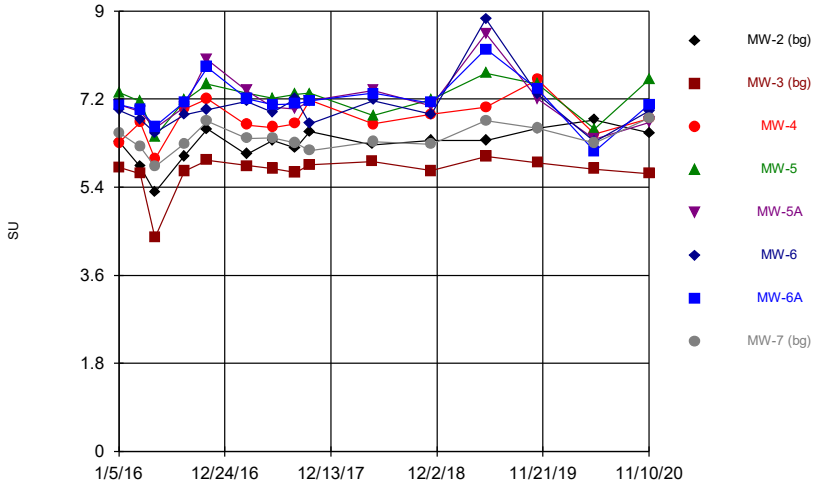
Fluoride



Time Series Analysis Run 12/2/2020 1:29 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

pH



Time Series Analysis Run 12/2/2020 1:29 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

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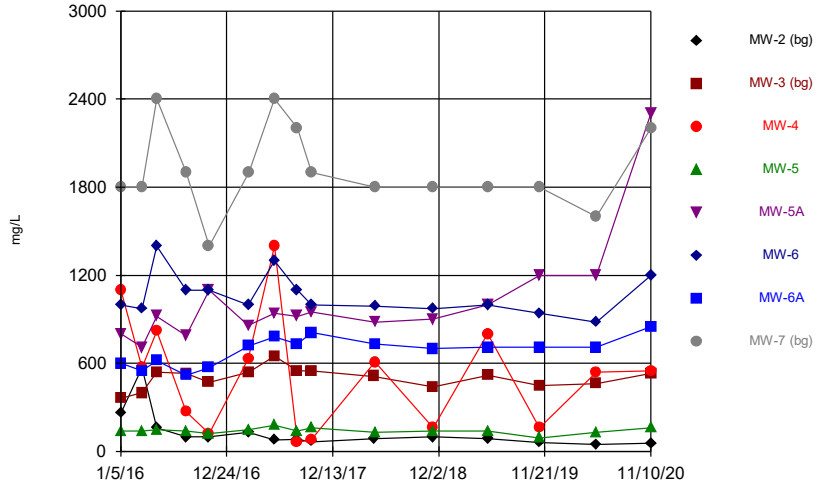
Sulfate



Time Series Analysis Run 12/2/2020 1:29 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

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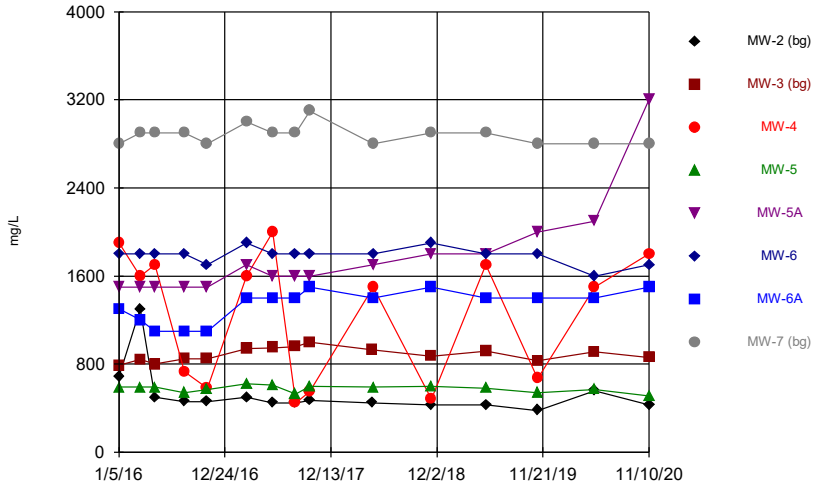
Total Dissolved Solids



Time Series Analysis Run 12/2/2020 1:29 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Sanitas™ Output – Sampling Event

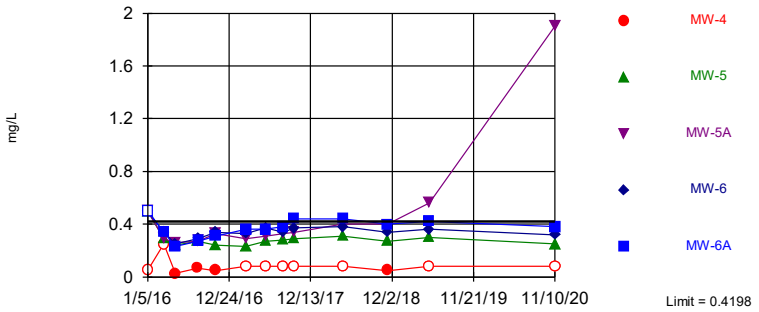
Prediction Limits

Hollow symbols indicate censored values.

Exceeds Limit: MW-5A

Boron

Interwell Parametric



Background Data Summary (based on cube root transformation) (after Kaplan-Meier Adjustment): Mean=0.4907, Std. Dev.=0.1361, n=39, 23.08% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9378, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

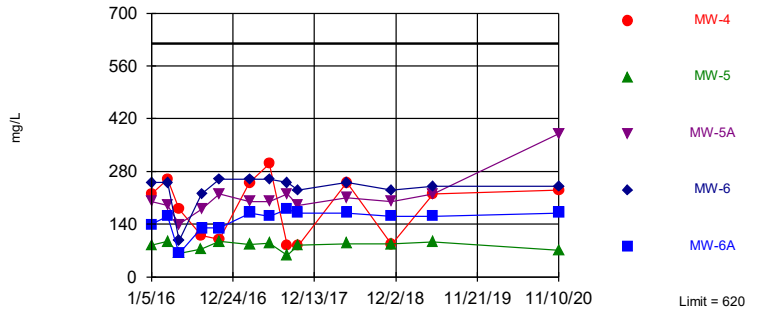
Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Within Limit

Calcium

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

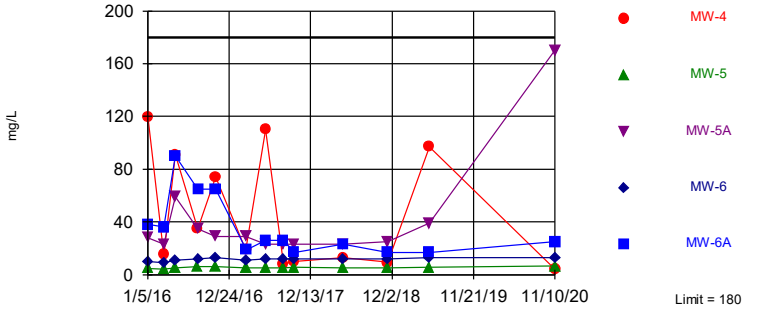
Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Within Limit

Chloride

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/1/2020 4:45 PM

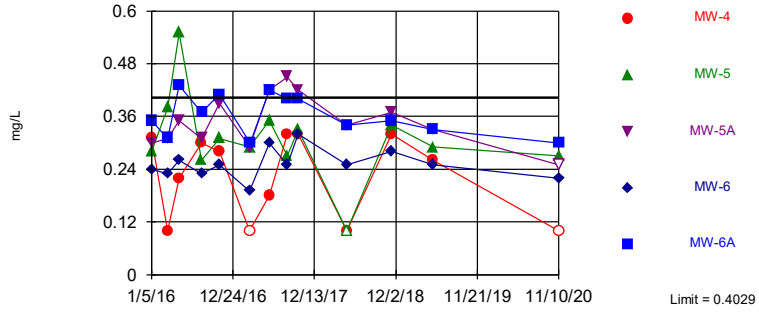
The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Hollow symbols indicate censored values.

Within Limit

Fluoride

Interwell Parametric



Background Data Summary (based on square root transformation): Mean=0.4783, Std. Dev.=0.08255, n=39, 5.128% NDs. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.934, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

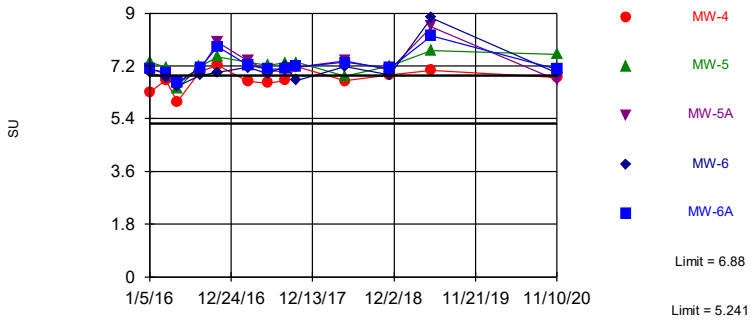
Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Exceeds Limits: MW-5, MW-6, MW-6A

pH

Interwell Parametric



Background Data Summary (based on square transformation): Mean=37.4, Std. Dev.=5.24, n=39. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9363, critical = 0.917. Kappa = 1.896 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.000752. Comparing 5 points to limit.

Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

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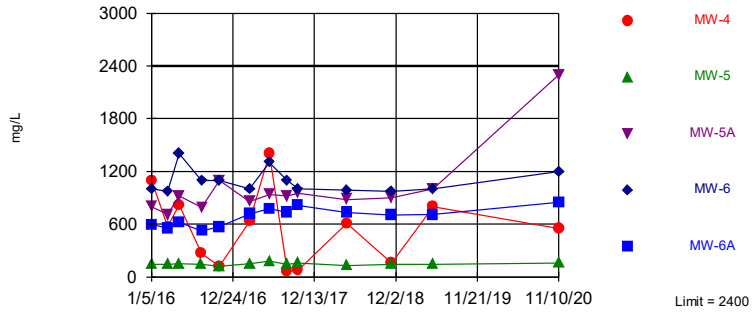
Within Limit

Sulfate

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/1/2020 4:45 PM

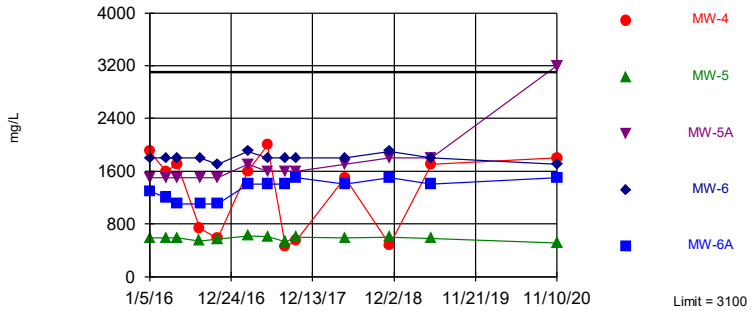
The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Sanitas™ v.9.6.27 Sanitas software licensed to Midwest Environmental Consultants. UG

Exceeds Limit: MW-5A

Total Dissolved Solids

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 39 background values. Annual per-constituent alpha = 0.01194. Individual comparison alpha = 0.0012 (1 of 2). Comparing 5 points to limit. Seasonality was not detected with 95% confidence.

Prediction Limit Analysis Run 12/1/2020 4:45 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background

Prediction Limit

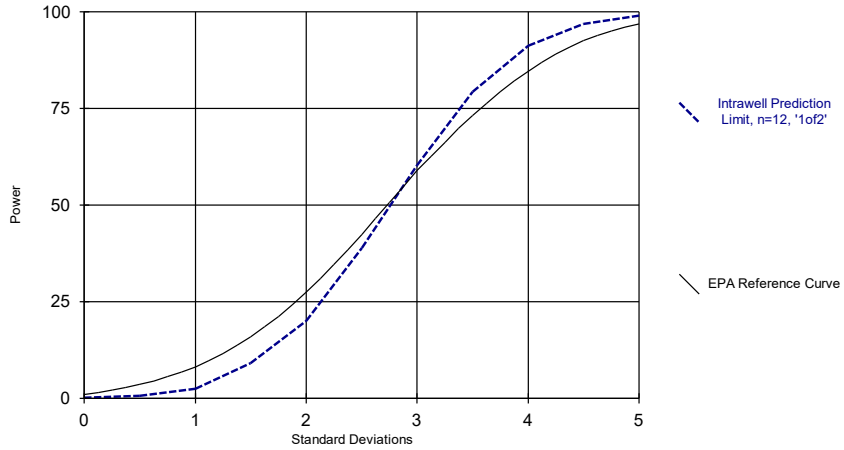
The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background Printed 12/1/2020, 4:46 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Boron (mg/L)	MW-4	0.4198	n/a	11/10/2020	0.08ND	No	39	23.08	x^(1/3)	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-5	0.4198	n/a	11/10/2020	0.25	No	39	23.08	x^(1/3)	0.001504	Param Inter 1 of 2
Boron (mg/L)	**MW-5A**	**0.4198**	**n/a**	**11/10/2020**	**1.9**	**Yes**	**39**	**23.08**	**x^(1/3)**	**0.001504**	**Param Inter 1 of 2**
Boron (mg/L)	MW-6	0.4198	n/a	11/10/2020	0.32	No	39	23.08	x^(1/3)	0.001504	Param Inter 1 of 2
Boron (mg/L)	MW-6A	0.4198	n/a	11/10/2020	0.38	No	39	23.08	x^(1/3)	0.001504	Param Inter 1 of 2
Calcium (mg/L)	MW-4	620	n/a	11/10/2020	230	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-5	620	n/a	11/10/2020	71	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-5A	620	n/a	11/10/2020	380	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-6	620	n/a	11/10/2020	240	No	39	0	n/a	0.0012	NP Inter (normality) ...
Calcium (mg/L)	MW-6A	620	n/a	11/10/2020	170	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-4	180	n/a	11/10/2020	4.4	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-5	180	n/a	11/10/2020	6.4	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-5A	180	n/a	11/10/2020	170	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-6	180	n/a	11/10/2020	13	No	39	0	n/a	0.0012	NP Inter (normality) ...
Chloride (mg/L)	MW-6A	180	n/a	11/10/2020	25	No	39	0	n/a	0.0012	NP Inter (normality) ...
Fluoride (mg/L)	MW-4	0.4029	n/a	11/10/2020	0.1ND	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-5	0.4029	n/a	11/10/2020	0.27	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-5A	0.4029	n/a	11/10/2020	0.25ND	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-6	0.4029	n/a	11/10/2020	0.22	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-6A	0.4029	n/a	11/10/2020	0.3	No	39	5.128	sqrt(x)	0.001504	Param Inter 1 of 2
pH (SU)	MW-4	6.88	5.241	11/10/2020	6.8	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	**MW-5**	**6.88**	**5.241**	**11/10/2020**	**7.6**	**Yes**	**39**	**0**	**x^2**	**0.000752**	**Param Inter 1 of 2**
pH (SU)	MW-5A	6.88	5.241	11/10/2020	6.72	No	39	0	x^2	0.000752	Param Inter 1 of 2
pH (SU)	**MW-6**	**6.88**	**5.241**	**11/10/2020**	**6.96**	**Yes**	**39**	**0**	**x^2**	**0.000752**	**Param Inter 1 of 2**
pH (SU)	**MW-6A**	**6.88**	**5.241**	**11/10/2020**	**7.09**	**Yes**	**39**	**0**	**x^2**	**0.000752**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-4	2400	n/a	11/10/2020	550	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-5	2400	n/a	11/10/2020	160	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-5A	2400	n/a	11/10/2020	2300	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-6	2400	n/a	11/10/2020	1200	No	39	0	n/a	0.0012	NP Inter (normality) ...
Sulfate (mg/L)	MW-6A	2400	n/a	11/10/2020	850	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-4	3100	n/a	11/10/2020	1800	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-5	3100	n/a	11/10/2020	510	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	**MW-5A**	**3100**	**n/a**	**11/10/2020**	**3200**	**Yes**	**39**	**0**	**n/a**	**0.0012**	**NP Inter (normality) ...**
Total Dissolved Solids (mg/L)	MW-6	3100	n/a	11/10/2020	1700	No	39	0	n/a	0.0012	NP Inter (normality) ...
Total Dissolved Solids (mg/L)	MW-6A	3100	n/a	11/10/2020	1500	No	39	0	n/a	0.0012	NP Inter (normality) ...

Sanitas™ Output – Sampling Event

Power Curve

Power Curve



Kappa = 2.73, based on 18 compliance wells and 5 constituents, evaluated semi-annually (this report reflects annual total).

Analysis Run 12/1/2020 4:47 PM

The Empire District Client: Midwest Environmental Consultants Data: 11-20 App 3 Asbury ponds with background