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2020 Annual Groundwater Monitoring and Corrective Action Report Shiras Steam Plant Holding Pond

Marquette, Michigan

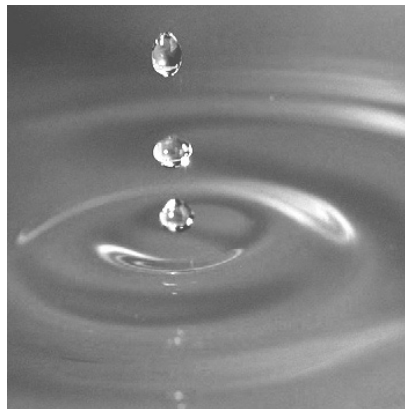
Submitted to:

Marquette Board of Light and Power
2200 Wright Street
Marquette, Michigan 49855

Submitted by:

GEI Consultants of Michigan P.C.
109 W. Baraga Avenue
Marquette, Michigan 49855

December 7, 2020
Project 1903625



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PROFESSIONAL ENGINEER CERTIFICATION

“I hereby certify that this 2020 Annual Groundwater Monitoring and Corrective Action Report documents closure of the Shiras Steam Plant Holding Pond owned and operated by the Marquette Board of Light and Power meets requirements in federal regulation 40 CFR § 257.90 of the Standards of Coal Combustion Residuals (CCR) in Landfills and Impoundments published April 17, 2015. Note, final construction documentation of CCR removal pursuant to § 257.102(c) are discussed under a separate cover. I am a duly licensed Professional Engineer under the laws of the State of Michigan.”

Sincerely,

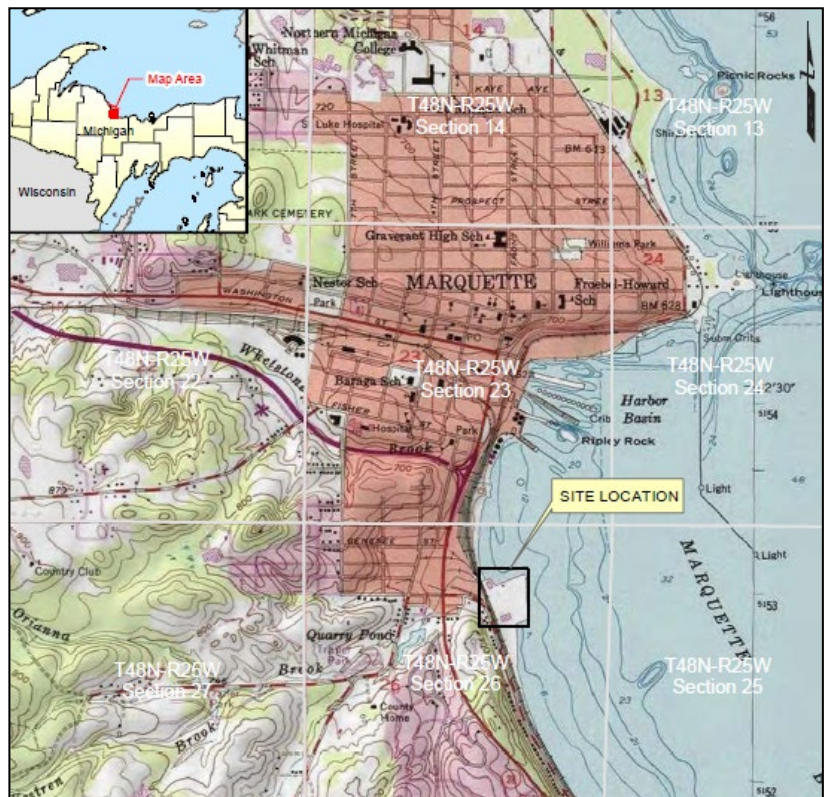


Michael D. Carpenter, PE (MI No. 6201046532)

1. Introduction

1.1 General

The Marquette Board of Light and Power (MBLP) owns and has historically operated a fossil fuel-fired electrical generating plant known as the Shiras Steam Plant (Plant) located at 400 East Hampton Street in Marquette, Michigan. The Plant was built in 1967 and consisted of three power generating units that have been removed from service. The Plant previously utilized a single coal combustion residuals (CCR) Holding Pond (WDS ID# 478988) that met the criteria of a CCR surface impoundment per Part 257.2 of the CCR Rule. The Holding Pond underwent closure by removal which was completed in September 2020 in accordance with Part 257.102(c), which was summarized in the Ash Pond Clean Closure and Stormwater Management Construction Documentation Report (GEI, 2020). The Holding Pond consisted of five individual sluicing cells that were enclosed by sheet pile walls against the shoreline of Lake Superior. The Holding Pond operated as a zero-discharge CCR unit and, following sluicing through the five cells, contact water was recirculated back to the plant as process water or to a storage tank for future use. Following completion of closure by removal, the three downgradient groundwater monitoring wells in Lake Superior were decommissioned in October 2020. The two upgradient wells were decommissioned in November 2020. Monitoring well decommissioning logs are included in Appendix A.



1.2 CCR Rule Background and Detection Monitoring and Reporting

This Annual Groundwater Monitoring and Corrective Action Report (Annual Groundwater Report) for the Hold Pond at the Shiras Facility was prepared as required by Part 257.90(e), and includes:

- A site map with well locations
- Documentation of sampling activities
- Status of monitoring (detection, assessment, corrective action monitoring)
- Groundwater quality monitoring results
- Data analysis
- Well abandonment records
- Recommendations and planned events for 2021

Specifically, this report provides a summary and statistical evaluation of detection monitoring groundwater analytical results from samples collected from the groundwater monitoring network at the Shiras facility in accordance with methods described in the *Coal Combustion Residuals Rule Statistical Methods Certification (AECOM, 2018)* prepared for the facility dated January 30, 2018.

2. Groundwater Monitoring System

A *Groundwater Monitoring System Certification* (AECOM, 2018) was prepared to satisfy the groundwater monitoring system performance standard in 40 CFR 27 Part 257.91 and describes groundwater sampling and analysis procedures at the Holding Pond. Detection monitoring at the Holding Pond was performed in June and August 2020 and included samples collected at each groundwater monitoring system location for the Appendix III analytes listed in Table 1. The groundwater system monitoring locations and their relative hydraulic location to the Holding Pond unit are summarized on Table 2. A description of the CCR Rule groundwater monitoring network is provided below.

2.1 Groundwater Monitoring Network

The CCR groundwater monitoring well network at the Holding Pond was designed to monitor groundwater quality in the uppermost aquifer at the facility and satisfy the performance standard in Part 257.91(a). Designated CCR Rule compliance monitoring wells were located upgradient and down gradient of the CCR landfill. Table 2 provides a summary of the groundwater monitoring locations and their hydraulic relationship to the Holding Pond. As discussed in Section 1.1, the downgradient monitoring wells in Lake Superior were decommissioned in October 2020. CCR Rule groundwater monitoring well locations are shown on Figure 1. Monitoring wells MW-4 and MW-5 serve as background groundwater quality points as required in 40 CFR Part 257.91. Monitoring wells MW-1, MW-2 and MW-3 were situated downgradient of the Holding Pond as shown on Figure 1.

2.2 Groundwater Flow Direction and Rate

The following section outlines the direction and rate of groundwater flow in the uppermost aquifer at the facility in accordance with Part 257.93(c).

2.2.1 Groundwater Flow

A groundwater contour map for the Holding Pond is provided on Figure 1 and presents groundwater elevations and contours in the uppermost aquifer for the June 2020 sampling event. As shown on the figure, groundwater flow is generally eastward toward Lake Superior. The rate of groundwater flow, or average linear velocity of groundwater in the uppermost aquifer is calculated by the following equation:

$$V = \frac{K i}{n_e}$$

Where:

V= average linear velocity (ft/day)

K= hydraulic conductivity (ft/day)

i= horizontal hydraulic gradient (dimensionless)

n_e = effective porosity (dimensionless)

The average linear velocity for groundwater at the Holding Pond was calculated between upgradient monitoring well MW-5 and downgradient monitoring well MW-1. The hydraulic gradient calculated for the June 2020 sampling event at the Holding Pond was 0.01. An effective porosity value of 0.25 (Fetter, 1994) and an average hydraulic conductivity value of 0.31 ft/day (AECOM, 2018) were used to represent the unconsolidated materials in the uppermost aquifer. The calculation of average linear groundwater velocity at the Holding Pond is therefore as follows:

$$V = \frac{(0.31 \text{ ft/day}) * (0.01)}{0.25}$$

$$V = 0.012 \text{ ft/day}$$

3. 2020 CCR Rule Compliance Activities

3.1 2020 Groundwater Monitoring

Groundwater samples were collected at each CCR Groundwater System monitoring location in accordance with the on the following dates:

- June 3, 2020 (First Semi-Annual Detection Monitoring Event)
- August 19, 2020 (Second Semi-Annual Detection Monitoring Event)

Groundwater elevations were measured at each groundwater monitoring location prior to well purging and sampling. A summary of groundwater elevations is provided in Table 3.

Groundwater field sampling logs are provided in Appendix B. Samples in all wells were collected utilizing dedicated sampling equipment at each location to eliminate the potential for cross-contamination at monitoring locations. Water quality parameters including temperature, oxidation-reduction potential, dissolved oxygen, pH, specific conductance and turbidity were monitored during well purging to assure representative samples are collected at each location. Samples that were collected for total metals analysis were unfiltered, with a sample turbidity goal of less than 50 nephelometric turbidity units (NTU). Samples were collected into laboratory-provided sample containers and couriered under chain-of-custody procedures to Pace Analytical Laboratories located in Green Bay, Wisconsin. Laboratory analytical packages for the First and Second Semiannual monitoring events are provided in Appendix C. Historic and recent laboratory results are summarized in Table 4.

3.2 2020 Reporting and Notifications

Statistically significant increases (SSIs) were not identified during 2020 detection monitoring events therefore; no additional operational reporting and notification requirements were necessary for 2020.

4. QA/QC Procedures

Quality assurance and quality control (QA/QC) measures were taken to ensure the reliability of Holding Pond operational data (field and laboratory) generated during the 2020 detection monitoring sampling events. These measures included field QA/QC with the collection of a field blank sample (equipment blanks were not required since dedicated sampling equipment is used at each monitoring location) and laboratory QA/QC.

4.1 Laboratory Data Usability

Samples collected during each quarterly monitoring event were analyzed by Pace Analytical Services, LLC located in Green Bay, Wisconsin. The laboratory performs an internal validation and prepares a case narrative as necessary to describe any non-conformance issues and data qualifications. GEI Consultants of Michigan, P.C. (GEI) reviewed the data qualifications and blank analyses to establish usability of the data. All data were found to be usable in the subsequent statistical evaluations as qualified.

5. Statistical Evaluation of Groundwater Results

The Sanitas™ groundwater statistical software was used to perform the statistical analyses (Sanitas™, 2007). Sanitas™ is a proprietary decision support software package, developed in 1991, that incorporates the statistical tests required of Subtitle C and D facilities by USEPA regulations and guidance as recommended in the USEPA Unified Guidance (USEPA, 2009) document.

The First and Second Semiannual 2020 detection monitoring groundwater data were screened for outliers using either Dixon's or Tukey's test for outliers. A visual evaluation of suspected outlying data was also performed, and no data outliers were verified for the 2020 monitoring period. A summary of the data outlier evaluations is provided in Appendices C1 and C2.

In accordance with the certified statistical analysis plan prepared for the facility (*Groundwater Monitoring System Certification* (AECOM, 2018)) an interwell data evaluation approach was used to evaluate the detection monitoring data at the Holding Pond and was used to generate intrawell prediction intervals for Appendix III parameters at CCR monitoring location shown on Figures 1. Interwell upper prediction limit plots are provided in Appendix D1 and D2 for the First and Second semi-annual events, respectively. Each Appendix III parameter was below its respective UPL except for pH in downgradient monitoring wells MW-1 and MW-3 during the Second Semiannual (August 2020) sampling event. FTC&H, Inc. prepared an Alternative Source Demonstration (ASD) in September 2018 to address the SSI of pH in downgradient groundwater. The ASD successfully identified the source of elevated pH at these locations as attributable to natural variability. As such, the September 2018 ASD supports the pH values in MW-1 and MW-3 during the August 2020 sampling event and no SSI was verified.

Trend tests using the Mann-Kendall analyses are included in Appendices D1 and D2. The Mann-Kendall evaluation, when combined with the Sen's Estimate of Slope collectively evaluate the statistical significance of concentration trends present in the analytical results. The results of the Mann-Kendall/Sen's Slope evaluations indicate that significantly increasing trends in calcium, chloride and pH were present in both upgradient and downgradient monitoring wells during the 2020 monitoring period. Sulfate concentrations downgradient of the Holding Pond exhibited both increasing (MW-1) and decreasing (MW-3) concentration trends during throughout 2020. These increasing and decreasing concentration trends upgradient and downgradient of the Holding Pond indicate significant natural variability in groundwater. Interwell prediction limit comparison between upgradient and downgradient wells indicate all Appendix III parameters are well below the respective UPLs and no SSIs have been identified for 2020.

In accordance with the requirements for closure by removal under Part 257.102(c), groundwater samples were analyzed for the Appendix IV list of constituents during the second semi-annual sampling event to demonstrate that concentrations in groundwater were below the respective groundwater protection standard. Confidence intervals were constructed for Appendix IV parameters as part of the September 2020 sampling event and are presented in Appendix D2. Concentrations of all Appendix IV parameters were below the respective groundwater protection standard and no statistically significant levels (SSLs) were identified.

6. Recommendations and Planned Events for 2021

The Holding Pond underwent closure by removal in September 2020 in accordance with Part 257.102c. Detection monitoring analytical results indicate that all Appendix III and Appendix IV parameters are below their respective UPLs and/or groundwater protection standards, and no SSIs have been identified during the 2020 monitoring period. Following the completion of closure by removal, the Holding Pond no longer meets the criteria of an active surface impoundment. Subsequently, the detection groundwater monitoring program at the Shiras Steam Plant Holding Pond has been terminated and wells abandoned (see abandonment reports in Appendix A). No annual inspection of the Holding Pond was performed as a result of the closure. With the abandonment of the monitoring wells in 2020, there are no planned detection monitoring events for 2021 or beyond.

7. References

GEI, November 13, 2020. Ash Pond Clean Closure & Stormwater Management Construction Documentation Report.

AECOM Technical Services of Michigan, January 2018. First Annual CCR Groundwater Monitoring and Corrective Action Report-2017.

Fetter, C.W., 1994. Applied Hydrogeology, Third Edition.

Fishbeck, Thompson, Carr & Huber, Inc., January 2019. Second Annual Coal Combustion Residuals Groundwater Monitoring and Corrective Action Report 2018.

US Environmental Protection Agency, 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities; Unified Guidance. EPA 530/R-09-007.

US Environmental Protection Agency, May 2009. National Primary Drinking Water Regulations. EPA 816-F-09-004.

Sanitas Technologies User Manual v.9.4.41, 2014.

Tables

Table 1. CCR Groundwater Monitoring Parameters
Year 2020 Annual Solid Waste and Groundwater Quality Monitoring Report
Shiras Steam Plant Holding Pond
Marquette, Michigan

Appendix III Parameters	Appendix IV Parameters
Boron Calcium Chloride Fluoride pH Sulfate TDS	Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Fluoride Lead Lithium Mercury Radium 226 Radium 228 Selenium Thallium

Table 2. CCR Groundwater Monitoring Network
Year 2020 Annual Solid Waste and Groundwater Quality Monitoring Report
Shiras Steam Plant Holding Pond
Marquette, Michigan

Well ID	Well Installation Date	TOC Elevation (ft MSL)	Ground Surface Elevation (ft MSL)	Total Depth (feet)	Bottom Elevation (ft MSL)	Screen Length (feet)	Top of Screen (feet bgs)	Bottom of Screen (feet bgs)	Hydraulic Relationship to Holding Pond
MW-1	6/27/2017	606.46	N/A	20.0	576.99	5	24.5	29.5	Downgradient
MW-2	6/28/2017	605.66	N/A	22.0	576.73	5	23.8	28.8	Downgradient
MW-3	6/29/2017	605.94	N/A	21.0	576.89	5	24.0	29.0	Downgradient
MW-4	7/6/2017	624.27	622.27	47.0	575.27	5	42.0	47.0	Upgradient
MW-5	7/7/2017	623.87	621.87	45.0	576.87	15	30.0	45.0	Upgradient

Notes:

TOC- Top of Casing

ft MSL- feet above mean sea level

bgs- below ground surface

Table 3. Groundwater Elevation Summary
Year 2020 Annual Solid Waste and Groundwater Quality Monitoring Report
Shiras Steam Plant Holding Pond
Marquette, Michigan

Well ID	Reference Elevation	June-20		August-20	
		DTW (ft.)	GW Elevation (fasl) ⁽¹⁾	DTW (ft.)	GW Elevation (fasl)
MW-1	606.46	0.00	606.46	8.87	597.59
MW-2	605.66	0.10	605.56	4.21	601.45
MW-3	605.94	0.00	605.94	7.59	598.35
MW-4	624.27	14.61	609.66	16.88	607.39
MW-5	623.87	14.63	609.24	18.35	605.52

DTW = Depth to water

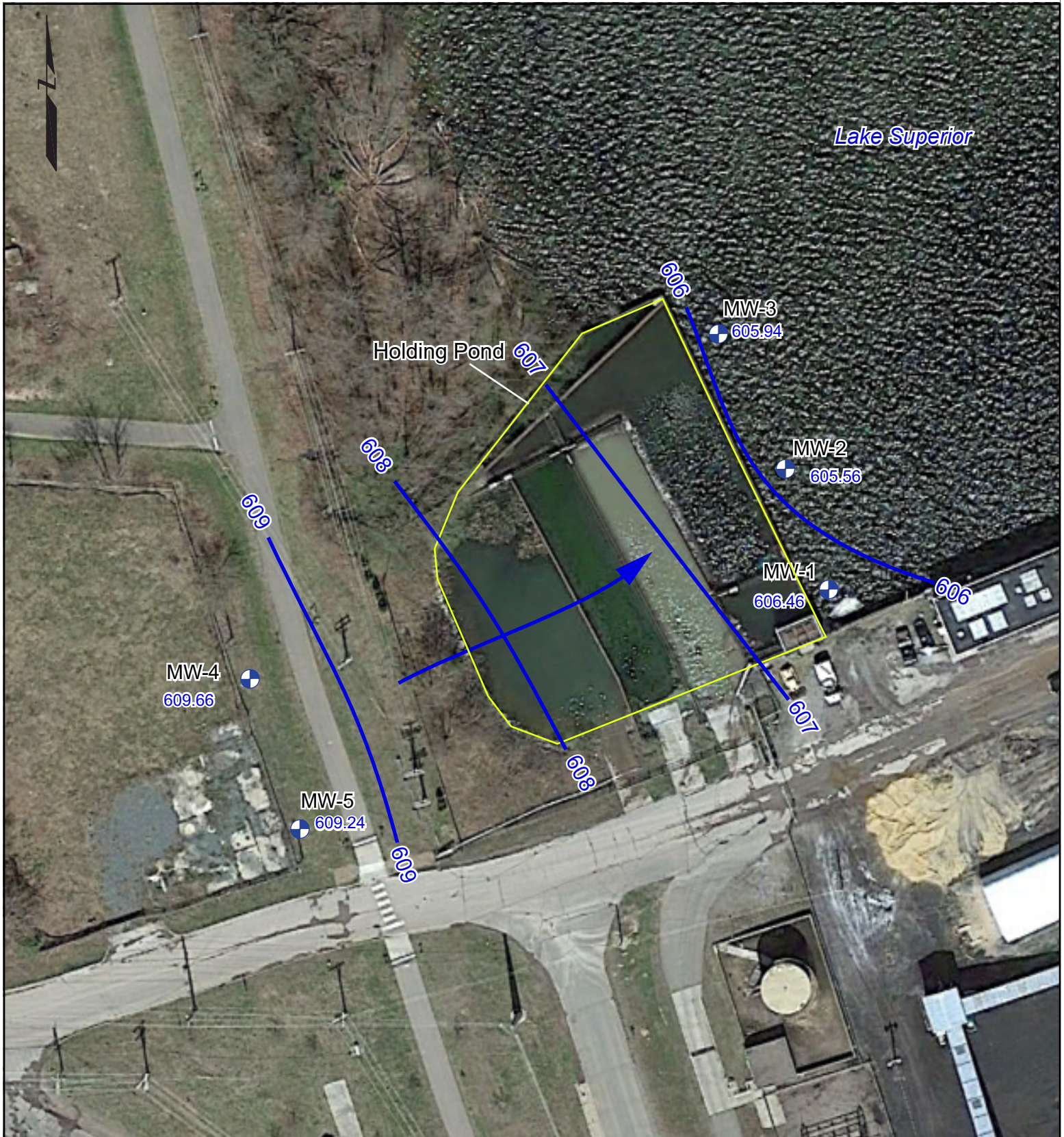
GW = Groundwater

(1) fasl = feet above sea level





Table 4. CCR Rule Groundwater Analytical Summary
Year 2020 Annual Solid Waste and Groundwater Quality Monitoring Report
Shiras Steam Plant Holding Pond
Marquette, Michigan

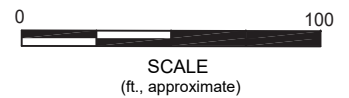
Lab Suite:				CCR Appendix III										CCR Appendix IV																			
Parameter:				Boron	Calcium	Chloride	Fluoride	Sulfate	Total Dissolved Solids (TDS)	pH	Iron	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride	Lead	Lithium	Mercury	Molybdenum	Radium 226 & 228 Combined	Radium 226	Radium 228	Selenium	Thallium					
Units:				µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	SU	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	pCi/L	pCi/L	pCi/L	µg/L	µg/L					
U.S. EPA MCL:				NE	NE	NE	4.0	NE	NE	NE	300.0	6.0	10	2.0	4.0	5.0	100	40 (M)	2 (M)	4 (M)	170 (M)	2.0	73 (M)	5.0	NE	NE	50	2.0					
Location	Well ID	Collection Date	Duplicate																														
Downgradient	MW-1	07/19/17		300 U	100,000	230	0.38 U	19	700	7.58																							
		07/24/17		300 U	110,000	230	0.38 U	20	800	7.45																							
		08/23/17		300 U	120,000	260	0.10 U	21	800	7.54																							
		08/29/17		300 U	130,000	270	0.10 U	20	960	6.56																							
		09/06/17		300 U	130,000	270	0.10 U	21	930	7.56																							
		09/14/17		300 U	110,000	290	0.10 U	22	980	7.60																							
		09/28/17		530	120,000	270	0.10 U	20	920	7.58																							
		09/28/17	X	300 U	120,000	270	0.10 U	21	990	7.58																							
		10/05/17		300 U	130,000	280	0.10 U	21	820	7.55																							
		10/05/17	X	300 U	120,000	270	0.10 U	21	880	7.55																							
	05/31/18		66 J	110,000	310	0.046 J	25	770	7.8																								
	09/20/18		67 J	120,000	300	0.044 J	24	740	7.9																								
	08/13/19		73	109,000	269	0.10 U	27	694	7.9	1300																							
	10/17/19		91	109,000	247	0.10 U	27	616	7.8	110 J																							
	06/03/20		64	83900	241	0.095 U	23.9	518	7.92	100 J																							
	08/19/20		21 J	37,000	87	0.095 U	10	276	8.1	110 J	1.5 U	8.5	0.06	0.3 U	0.2 U	1 U	0.1 U	0.095 U	0.2 U	8	0.06	0.9 J	0.567	0.168	0.399	0.3 U	0.1 U						
	Downgradient	MW-2	07/19/17		300 U	51,000	60	0.38 U	22	220	8.41																						
			07/24/17		300 U	63,000	59	0.38 U	21	350	8.09																						
			08/23/17		300 U	51,000	62	0.10 U	26	190	8.13																						
			08/29/17		300 U	52,000	61	0.10 U	22	350	7.03																						
08/29/17			X	300 U	53,000	61	0.10 U	22	320	7.03																							
09/06/17				300 U	53,000	60	0.10 U	21	310	8.15																							
09/14/17				300 U	52,000	64	0.10 U	23	300	8.13																							
09/28/17				300 U	58,000	65	0.10 U	21	350	8.07																							
10/05/17				300 U	61,000	65	0.10 U	21	310	7.99																							
05/31/18				74 J	68,000	86	0.056	31	330	8.0																							
05/31/18	X	75 J	70,000	86	0.057	31	330	8.0																									
09/20/18		55 J	64,000	85	0.058	29	310	8.0																									
08/13/19		63	62,600	86	0.10 U	31	336	7.9	790																								
10/17/19		56 J	55,800	55	0.10 U	21	238	8.0	110 J																								
06/03/20		44 J	56,500	65	0.10 U	23	290	8.0	35 U																								
08/19/20		140	55,000	66	0.11 J	49	336	8.0	150	1.5 U	12.5	0.075	0.3 U	0.2 U	1 U	0.1 U	0.11 J	0.2 U	6.4	0.06	3.2	0.978	0.109	0.869	0.3 U	0.1 U							
Downgradient	MW-3	07/19/17		300 U	68,000	98	0.38 U	49	360	8.00																							
		07/24/17		300 U	69,000	89	0.38 U	36	440	7.86																							
		08/23/17		300 U	75,000	95	0.10 U	44	300	7.81																							
		08/29/17		300 U	62,000	86	0.10 U	28	390	6.32																							
		09/06/17		300 U	62,000	85	0.10 U	26	380	7.77																							
		09/14/17		300 U	57,000	83	0.10 U	25	380	7.85																							
		09/14/17	X	300 U	56,000	84	0.10 U	24	380	7.85																							
		09/28/17		300 U	67,000	89	0.10 U	20	440	8.09																							
		10/05/17		300 U	69,000	87	0.10 U	21	350	8.10																							
		05/31/18		45 J	55,000	67	0.067	20	290	8.2																							
09/20/18		41 J	70,000	92	0.055	22	340	8.1																									
08/13/19		36 J	72,800	99	0.10 U	23	326	8.1	720																								
10/17/19		47 J	64,900	78	0.10 U	19	278	8.0	45 J																								
06/03/20		35 J	70,500	104	0.095 U	21	396	8.1	66 J																								
08/19/20		37 J	66,000	104	0.095 U	27	404	8.1	35 U	1.5 U	0.9	0.12	0.3 U	0.2 U	1 U	0.1 U	0.095 U	0.2 U	7.6	0.06	1.1 J	0.917	0.513	0.404	0.3 U	0.1 U							
Upgradient	MW-4	07/19/17		300 U	93,000	260	0.38 U	19	700	7.92																							
		07/24/17		300 U	89,000	220	0.38 U	18	730	7.86																							
		07/24/17	X	300 U	89,000	230	0.38 U	19	710	7.86																							
		08/23/17		300 U	100,000	300	0.10 U	24	830	7.93																							
		08/29/17		300 U	120,000	340	0.10 U	47	1,000	7.32																							
		09/06/17		300 U	110,000	340	0.20	53	1,000	7.75																							
		09/14/17		300 U	100,000	360	0.18	49	1,000	7.77																							
		09/28/17		300 U	160,000	370	0.12	46																									

Figures



LEGEND

-  Monitoring Well Location
-  **606.16** Groundwater Elevation
(feet above sea level, June 2020 data)
-  Groundwater Isocontour
(feet above sea level, dashed where inferred)
-  Groundwater Flow Direction



<p>2020 Annual CCR Groundwater Monitoring and Corrective Action Report</p>		<p>MONITORING WELL NETWORK and GROUNDWATER CONTOUR MAP</p>
<p>Shiras Steam Plant Holding Pond Marquette, Michigan</p>	<p>Project 1903625</p>	<p>November 2020 Figure 1</p>

Appendix A- Monitoring Well Decommissioning Logs

LETTER OF TRANSMITTAL

To:	Nick Doney	Date:	10/23/2020
	MJ Van Damme, Inc.	TriMedia Project No:	2020-2660
	Nick.doney@mjvandammeinc.com		
RE:	Marquette BLP Ash Pond Closure – MW Abandonment Forms		
<input type="checkbox"/>	For approval	<input type="checkbox"/>	As requested
<input type="checkbox"/>	For your action	<input checked="" type="checkbox"/>	For your files
<input type="checkbox"/>	For review and comment	<input type="checkbox"/>	Return signed copies

Nick,

Attached are the MW Abandonment forms from the Marquette BLP Ash Pond Closure site. The wells were abandoned 10/14/2020. Please let me know if you have any questions or concerns.



Bradley G. Parlato, PE

Senior Engineer / Regional Manager

Monitor Well Abandonment Record

Site Name: Marquette BLP Ash Pond Closure County: Marquette

Section: 26 Town: 48N

MW#: MW-1 Range: 25S

Date Installed: 6/26/2017 - 6/27/2017 Date Abandoned: 10/14/2020

Drilling Company: TriMedia Environmental & Engineering LLC

Well Depth: 20 ft bgs Confirmed Screen Depth: 15.0 ft bgs

Water Table Depth: 0.0 from TOC

Casing Type:

PVC Galvanized Steel Stainless Steel 2 inch 4 inch

Screen Type:

PVC Stainless Steel Length: 5.0 ft

Annulus Grouted:

Yes No From: 0.0 ft To: +/- 12.0 ft bgs

Grout Type: Bentonite/Cement

Casing Pulled:

Yes No

Casing Cut:

Yes @ 12.0 ft from TOC No

Well Grouted:

Yes No

Grout Type:

Cement Bentonite Other (specify) _____

Grout Method Used:

Through Casing Tremie Other (explain below)

Comments:

Outer steel casing removed; well riser cut at approximately 4' below grade after approximately 4 hours of set time. Well was completely plugged using Bentonite gel slurry via tremie methods. Approximately 1 50# bag of material was utilized to tremie grout entire length of well.

ATTACH COPY OF ORIGINAL WELL LOG IF AVAILABLE

ft. = foot/feet

in. = inch

lbs. = pounds

bTOC = below top of casing

ags = above ground surface

bgs = below ground surface

Rev. 03/10/2016

Monitor Well Abandonment Record

Site Name: Marquette BLP Ash Pond Closure County: Marquette

Section: 26 Town: 48N

MW#: MW-2 Range: 25S

Date Installed: 6/29/2017 Date Abandoned: 10/14/2020

Drilling Company: TriMedia Environmental & Engineering LLC

Well Depth: 22.0 ft bgs Confirmed Screen Depth: 17.0 ft bgs

Water Table Depth: 0.0 from TOC

Casing Type:

PVC Galvanized Steel Stainless Steel 2 inch 4 inch

Screen Type:

PVC Stainless Steel Length: 5.0 ft

Annulus Grouted:

Yes No From: 0.0 ft To: +/- 12.0 ft bgs

Grout Type: Bentonite/Cement

Casing Pulled:

Yes No

Casing Cut:

Yes @ 11.0 ft from TOC No

Well Grouted:

Yes No

Grout Type:

Cement Bentonite Other (specify) _____

Grout Method Used:

Through Casing Tremie Other (explain below)

Comments:

Outer steel casing removed; well riser cut at approximately 4' below grade after approximately 4 hours of set time. Well was completely plugged using Bentonite gel slurry via tremie methods. Approximately 1 50# bag of material was utilized to tremie grout entire length of well.

ATTACH COPY OF ORIGINAL WELL LOG IF AVAILABLE

ft. = foot/feet

in. = inch

lbs. = pounds

bTOC = below top of casing

ags = above ground surface

bgs = below ground surface

Rev. 03/10/2016

Monitor Well Abandonment Record

Site Name: Marquette BLP Ash Pond Closure County: Marquette

Section: 26 Town: 48N

MW#: MW-3 Range: 25S

Date Installed: 6/29/2017 Date Abandoned: 10/14/2020

Drilling Company: TriMedia Environmental & Engineering LLC

Well Depth: 21.0 ft bgs Confirmed Screen Depth: 15.0 ft bgs

Water Table Depth: 0.0 from TOC

Casing Type:

PVC Galvanized Steel Stainless Steel 2 inch 4 inch

Screen Type:

PVC Stainless Steel Length: 5.0 ft

Annulus Grouted:

Yes No From: 0.0 ft To: +/- 12.0 ft bgs

Grout Type: Bentonite/Cement

Casing Pulled:

Yes No

Casing Cut:

Yes @ 12.0 ft from TOC No

Well Grouted:

Yes No

Grout Type:

Cement Bentonite Other (specify) _____

Grout Method Used:

Through Casing Tremie Other (explain below)

Comments:

Outer steel casing removed; well riser cut at approximately 4' below grade after approximately 4 hours of set time. Well was completely plugged using Bentonite gel slurry via tremie methods. Approximately 1 50# bag of material was utilized to tremie grout entire length of well.

ATTACH COPY OF ORIGINAL WELL LOG IF AVAILABLE

ft. = foot/feet

in. = inch

lbs. = pounds

bTOC = below top of casing

ags = above ground surface

bgs = below ground surface

Rev. 03/10/2016



4000 Portage Street, Suite 101
Kalamazoo, Michigan 49001
269.789.9575
www.trimediaee.com

LETTER OF TRANSMITTAL

To: Nick Doney	Date: 12/4/2020	
MJ Van Damme, Inc.	TriMedia Project No: 2020-2660	
Nick.doney@mjvandammeinc.com		
RE: Marquette BLP Ash Pond Closure – MW Abandonment Forms		
<input type="checkbox"/> For approval	<input type="checkbox"/> As requested	<input type="checkbox"/>
<input type="checkbox"/> For your action	<input checked="" type="checkbox"/> For your files	<input type="checkbox"/>
<input type="checkbox"/> For review and comment	<input type="checkbox"/> Return signed copies	<input type="checkbox"/>

Nick,

Attached are the MW-4 and MW-5 Abandonment forms from the Marquette BLP Ash Pond Closure site. The wells were abandoned 11/24/2020. Please let me know if you have any questions or concerns.

Bradley G. Parlato, PE

Senior Engineer / Regional Manager

Monitor Well Abandonment Record

Site Name: Marquette BLP Ash Pond Closure County: Marquette

Section: 26 Town: 48N

MW#: MW-4 Range: 25S

Date Installed: 7/5/2017 - 7/6/2017 Date Abandoned: 11/24/2020

Drilling Company: TriMedia Environmental & Engineering LLC

Well Depth: 47.0 ft bgs Confirmed Screen Depth: 46.94 ft bgs

Water Table Depth: 16.22 ft

Casing Type:

PVC Galvanized Steel Stainless Steel 2 inch 4 inch

Screen Type:

PVC Stainless Steel Length: 5.0 ft

Annulus Grouted:

Yes No From: 2.0 ft To: 39.0 ft bgs

Grout Type: _____

Casing Pulled:

Yes No

Casing Cut:

Yes @ 24.0 ft No

Well Grouted:

Yes No

Grout Type:

Cement Bentonite Other (specify) Bentonite Slurry

Grout Method Used:

Through Casing Tremie Other (explain below)

Comments:

ATTACH COPY OF ORIGINAL WELL LOG IF AVAILABLE

ft. = foot/feet

in. = inch

lbs. = pounds

bTOC = below top of casing

ags = above ground surface

bgs = below ground surface

Rev. 03/10/2016

Monitor Well Abandonment Record

Site Name: Marquette BLP Ash Pond Closure County: Marquette

Section: 26 Town: 48N

MW#: MW-5 Range: 25S

Date Installed: 7/6/2017 - 7/7/2017 Date Abandoned: 11/24/2020

Drilling Company: TriMedia Environmental & Engineering LLC

Well Depth: 45.0 ft bgs Confirmed Screen Depth: 44.87 ft bgs

Water Table Depth: 14.62 ft

Casing Type:

PVC Galvanized Steel Stainless Steel 2 inch 4 inch

Screen Type:

PVC Stainless Steel Length: 5.0 ft

Annulus Grouted:

Yes No From: 2.0 ft To: 37 ft bgs

Grout Type: _____

Casing Pulled:

Yes No

Casing Cut:

Yes @ 24.0 ft No

Well Grouted:

Yes No

Grout Type:

Cement Bentonite Other (specify) Bentonite Slurry

Grout Method Used:

Through Casing Tremie Other (explain below)

Comments:

ATTACH COPY OF ORIGINAL WELL LOG IF AVAILABLE

ft. = foot/feet

in. = inch

lbs. = pounds

bTOC = below top of casing

ags = above ground surface

bgs = below ground surface

Rev. 03/10/2016

Appendix B- Monitoring Well Sampling Logs



COC No.

CHAIN OF CUSTODY

Preservation Codes
 A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
 H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Quote #: _____

Mail To Contact: Travis Anderson

Mail To Company: GEI Consultants

Mail To Address: 109 W. Baraga Avenue, Marquette, MI 49855

Invoice To Contact: SAA

Invoice To Company: SAA

Invoice To Address: SAA

Invoice To Phone: _____

CLIENT COMMENTS | **LAB COMMENTS (Lab Use Only)** | **Profile #**

Y/N	Pick Letter	Analyses Requested	Matrix
N	N		
N	A	TDS, pH	CL, F, SO ₄
D	A	Boron, Calcium, Iron	
X	X		GW
X	X		GW
X	X		GW
X	X		GW
X	X		GW
X	X		W

Regulatory Program: N/A

MS/MSD
 On your sample (billable)
 NOT needed on your sample

Data Package Options
 EPA Level III
 EPA Level IV

CLIENT FIELD ID

DATE	TIME	MATRIX
6/3	0951	GW
6/3	1120	GW
6/2	1300	GW
6/2	1958	GW
6/2	2040	GW
		W

Rush Turnaround Time Requested - Prelims (Rush TAT subject to approval/surcharge)
 Date Needed: _____

Transmit Prelim Rush Results by (complete what you want):

Email #1: _____ **Received By:** _____ **Date/Time:** 6/3/20 1400

Email #2: _____ **Received By:** _____ **Date/Time:** _____

Telephone: _____ **Received By:** _____ **Date/Time:** _____

Fax: _____ **Received By:** _____ **Date/Time:** _____

Receipt Temp = _____ **°C**

Sample Receipt pH
 OK / Adjusted _____

Cooler Custody Seal
 Present / Not Present _____

Intact / Not Intact
 Intact / Not Intact _____

PACE Project No. _____



MONITORING WELL SAMPLING RECORD

PID Reading _____
 Job Number _____
 Location _____
 Well Number MW-1

Job Name Shiras CCR
 By TJA Date 6/3/20
 Measurement Datum _____

Pre-Development Information
 Water Level φ φ (TOC)
 One Purge Vol 4.8

Time (start) 0800 EST
 Total Depth of Well 29.3
 Three Well Volume 14.4

Water Characteristics

Color _____ Clear Cloudy
 Odor None _____ Weak _____ Moderate _____ Strong

Any films or immiscible material _____

Volume (gal)	Time	pH	Temp (°C)	Spec. Conductance (µS/cm)	Turbidity (NTU)	DO Conc. (mg/L)	ORP (mV)	TDS
φ	9:19	7.60	9.7	1041	21.72	6.25	30.1	1
φ.2	9:24	10.13	9.3	1019	19.20	2.47	37.8	
φ.2	9:29	10.27	9.2	1024	23.96	1.83	36.1	
φ.2	9:34	10.34	9.2	1027	28.04	1.46	33.5	
φ.2	9:39	10.56	9.1	1032	32.00	1.32	33.42	
φ.2	9:44	10.45	9.4	1026	33.60	1.55	27.5	
φ.2	9:49	10.42	9.4	1026	32.00	1.91	26.3	
Sampled @ 9:51 EST								

Total Volume Removed (gal) _____ pH _____
 Temperature (°C) _____ Specific Conductance (µS/cm) _____
 DO Concentration (mg/L) _____ ORP (mV) _____
 TDS _____



Post Development Information

Water Level

7.04

Time (Finished)

0955

Total Depth of Well

Approximate Volume Removed (gal)

Water Characteristics

Color

Clear

Cloudy

Odor

None

Weak

Moderate

Strong

Any films or immiscible material

Comments

T / SWL

0800	φ	}	1.16 gal
0915	7.10		75 min

φ. φ15 gpm

$$\frac{1 \text{ L}}{5.14 \text{ min}} = .195 \text{ Lpm}$$

$$\phi. \phi 51 \text{ gpm}$$

Recharge = φ. φ 36 gpm

- Pumping rate = φ. φ 4 gpm

$$\frac{\phi. \phi 51 \text{ gal}}{\text{min}} \Big| \frac{75 \text{ min}}{75 \text{ min}} = 3.825 \text{ gal}$$

$$7.10' - 3.83' = (3.27') (264)$$

$$= \phi. \phi 86 \text{ gal}$$

$$\frac{\phi. \phi 86 \text{ gal}}{75 \text{ min}} = \phi. \phi 11 \text{ gpm}$$



MONITORING WELL SAMPLING RECORD

PID Reading _____
 Job Number 1903625
 Location _____
 Well Number MW-2

Job Name Shiras CCR
 By TJA Date 6/3/20
 Measurement Datum _____

Pre-Development Information

Water Level φ.1φ
 One Purge Vol 4.69

Time (start) 1010 EST
 Total Depth of Well 28.9
 Three Well Volume 14.1

Water Characteristics

Color _____ Clear _____ Cloudy
 Odor None _____ Weak _____ Moderate _____ Strong
 Any films or immiscible material _____

Volume (gal)	Time	pH	Temp (°C)	Spec. Conductance (µS/cm)	Turbidity (NTU)	DO Conc. (mg/L)	ORP (mV)	TDS
φ	11:00	8.41	8.4	420	1.50	1.62	96.4	
φ.2	11:05	8.13	8.6	410	φ.32	φ.89	36.2	
φ.2	11:10	8.09	8.7	409.9	φ.15	φ.82	26.9	
φ.2	11:15	8.07	8.4	410.8	φ.46	φ.78	13.1	
φ.2	11:20	8.05	8.5	410.5	φ.09	φ.74	8.0	
	Sampled @			11:20				

Total Volume Removed (gal) _____ pH _____
 Temperature (°C) _____ Specific Conductance (µS/cm) _____
 DO Concentration (mg/L) _____ ORP (mV) _____
 TDS _____



Post Development Information

Water Level 13.1
 Approximate Volume Removed (gal) _____

Time (Finished) 1130

Total Depth of Well _____

Water Characteristics

Color _____ Clear _____ Cloudy _____
 Odor _____ None _____ Weak _____ Moderate _____ Strong _____

Any films or immiscible material _____

Comments

$2'' = \phi .163 \text{ gal/inch}$

Vol Test: $\frac{1 \text{ L}}{3.16 \text{ min}} (\phi .264) = \phi .084 \text{ gpm}$
 Flow rate

Time	SUL
10:13	4.10
10:23	4.31
10:40	9.37
11:02	13.53
11:10	13.68

$\phi .69 \text{ gal} / 10 \text{ min} = \phi .069 \text{ gpm}$

Recharge = $\phi .084 - \phi .069$
 $= \phi .015 \text{ gpm}$

$(0.084 \frac{\text{gal}}{\text{min}})(10 \text{ min}) =$



MONITORING WELL SAMPLING RECORD

PID Reading _____
 Job Number 1903625
 Location _____
 Well Number MW-5

Job Name Shinas CCR
 By TJA Date 6/2/20
 Measurement Datum _____

Pre-Development Information
 Water Level 14.63
 One Purge Vol 4.93

Time (start) 8:00
 Total Depth of Well 44.85
 Three Well Volume 14.8

Water Characteristics

Color _____ Clear _____ Cloudy
 Odor None _____ Weak _____ Moderate _____ Strong

Any films or immiscible material _____

Volume (gal)	Time	pH	Temp (°C)	Spec. Conductance (µS/cm)	Turbidity (NTU)	DO Conc. (mg/L)	ORP (mV)	TDS
	8:16	7.41	9.7	1278	4.22	3.26	57.7	
φ.2	8:21	7.38	9.8	1288	2.48	3.04	63.1	
φ.2	8:26	7.38	9.8	1289	1.85	3.02	66.9	
φ.2	8:31	7.38	9.8	1294	φ.85	3.02	71.4	
φ.2	8:36	7.38	9.8	1295	1.40	3.02	74.2	
Sampled @				8:40				

Total Volume Removed (gal) _____ pH _____
 Temperature (°C) _____ Specific Conductance (µS/cm) _____
 DO Concentration (mg/L) _____ ORP (mV) _____
 TDS _____



Post Development Information

Time (Finished) 8:50

Water Level 15.60

Total Depth of Well _____

Approximate Volume Removed (gal) _____

Water Characteristics

Color _____ Clear _____ Cloudy _____

Odor _____ None _____ Weak _____ Moderate _____ Strong _____

Any films or immiscible material _____

Comments

T	SWL
8:16	15.72
8:30	15.70
8:50	15.60

Vol test: $\frac{1L}{6.6 \text{ min}} (\phi.264 \text{ gpm}) = \phi.\phi4 \text{ gpm}$
 (min)(gpm) = gal (actual)

16.70 @ 7:22 } $\phi.27 \text{ gpm}$
 15.07 @ 7:32 } recharge



MONITORING WELL SAMPLING RECORD

PID Reading _____
 Job Number 1903625
 Location _____
 Well Number MW-4

Job Name Shiras CCR
 By TJA Date 6/2/20
 Measurement Datum _____

Pre-Development Information

Water Level 14.61
 One Purge Vol 5.25

Time (start) 1510 EST
 Total Depth of Well 46.80
 Three Well Volume 15.75 @ 1800 EST

Water Characteristics

Color _____ Clear _____ Cloudy
 Odor None _____ Weak _____ Moderate _____ Strong

Any films or immiscible material _____

Volume (gal)	Time	pH	Temp (°C)	Spec. Conductance (µS/cm)	Turbidity (NTU)	DO Conc. (mg/L)	ORP (mV)	TDS
	7:32	7.62	10.4	1573	0.52	1.53	-99.8	
0.2	7:38	7.61	10.2	1569	1.91	1.30	-41.4	
0.2	7:43	7.56	10.0	1569	1.66	1.35	-39.1	
0.2	7:48	7.56	10.1	1568	1.79	1.36	-38.5	
0.2	7:52	7.54	10.5	1566	1.85	1.36	-38.4	
Sampled @ 7:58								

Total Volume Removed (gal) _____ pH _____
 Temperature (°C) _____ Specific Conductance (µS/cm) _____
 DO Concentration (mg/L) _____ ORP (mV) _____
 TDS _____



Post Development Information

Water Level

30.49

Time (Finished)

8:05

Approximate Volume Removed (gal)

16 gal

Total Depth of Well

Water Characteristics

Color

Clear

Cloudy

Odor

None

Weak

Moderate

Strong

Any films or immiscible material

Comments

Time	SWL
7:34	28.18
7:54	30.55

Vol Test: $\frac{1L}{6.6 \text{ min}} (\phi.264) = 0.04 \text{ gpm}$

() () = gal (actual)

27.7' @ 7:02 > 0.0093 gpm recharge
 26.9' @ 7:16



MONITORING WELL SAMPLING RECORD

PID Reading _____
 Job Number 1903625
 Location _____
 Well Number MW-3

Job Name Shiras CCR
 By TJA Date 6/3/20
 Measurement Datum _____

Pre-Development Information
 Water Level φ
 One Purge Vol 4.74

Time (start) 1130
 Total Depth of Well 29.1
 Three Well Volume 14.2

Water Characteristics

Color _____ Clear _____ Cloudy
 Odor None _____ Weak _____ Moderate _____ Strong
 Any films or immiscible material _____

Volume (gal)	Time	pH	Temp (°C)	Spec. Conductance (µS/cm)	Turbidity (NTU)	DO Conc. (mg/L)	ORP (mV)	TDS
<u>φ</u>	<u>1238</u>	<u>8.14</u>	<u>10.2</u>	<u>577</u>	<u>8.80</u>	<u>5.47</u>	<u>51.7</u>	
<u>φ.2</u>	<u>1244</u>	<u>8.17</u>	<u>10.3</u>	<u>574</u>	<u>1.46</u>	<u>4.43</u>	<u>18.8</u>	
<u>φ.2</u>	<u>1249</u>	<u>8.17</u>	<u>10.0</u>	<u>567</u>	<u>6.10</u>	<u>4.16</u>	<u>2.1</u>	
<u>φ.2</u>	<u>1253</u>	<u>8.16</u>	<u>9.9</u>	<u>562</u>	<u>2.96</u>	<u>4.06</u>	<u>-2.5</u>	
<u>φ.2</u>	<u>1258</u>	<u>8.17</u>	<u>9.9</u>	<u>559</u>	<u>7.38</u>	<u>3.77</u>	<u>-2.3</u>	
<u>Sampled @ 1:00</u>								

Total Volume Removed (gal) _____ pH _____
 Temperature (°C) _____ Specific Conductance (µS/cm) _____
 DO Concentration (mg/L) _____ ORP (mV) _____
 TDS _____



Post Development Information

Water Level

12.73

Time (Finished)

1313

Approximate Volume Removed (gal)

Total Depth of Well

Water Characteristics

Color

Clear

Cloudy

Odor

None

Weak

Moderate

Strong

Any films or immiscible material

Comments

Time	SWL
1139	φ
1151	4.83
1215	12.20
1230	12.63
1245	12.70

φ.φ 66 gpm

Vol Test $\frac{1 L}{3.4 \text{ min}} (\phi.264) = \phi. \phi 78 \text{ gpm}$

() () () = gpm (actual)

Recharge = φ.φ 12 gpm



recharge matched pumping rate; air bubbles in line due to sporadic aquifer recharge cause YSI to produce varying readings.

Appendix C- Laboratory Analytical Packages

June 16, 2020

Travis Anderson
GEI Consultants, Inc
109 W. Baraga Avenue
Marquette, MI 49855

RE: Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

Dear Travis Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on June 04, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Christopher Hyska
christopher.hyska@pacelabs.com
(920)469-2436
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40208801001	MW-01	Water	06/03/20 09:51	06/04/20 10:25
40208801002	MW-02	Water	06/03/20 11:20	06/04/20 10:25
40208801003	MW-03	Water	06/03/20 13:00	06/04/20 10:25
40208801004	MW-04	Water	06/03/20 19:58	06/04/20 10:25
40208801005	MW-05	Water	06/03/20 20:40	06/04/20 10:25
40208801006	FIELD BLANK	Water	06/03/20 00:00	06/04/20 10:25

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40208801001	MW-01	EPA 200.7	TXW	3	PASI-G
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208801002	MW-02	EPA 200.7	TXW	3	PASI-G
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208801003	MW-03	EPA 200.7	TXW	3	PASI-G
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208801004	MW-04	EPA 200.7	TXW	3	PASI-G
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208801005	MW-05	EPA 200.7	TXW	3	PASI-G
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40208801006	FIELD BLANK	EPA 200.7	TXW	3	PASI-G
		SM 2540C	HNT	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
40208801001	MW-01					
EPA 200.7	Boron	0.064	mg/L	0.058	06/05/20 05:34	
EPA 200.7	Calcium	83.9	mg/L	0.50	06/05/20 05:34	
EPA 200.7	Iron	0.10J	mg/L	0.12	06/05/20 05:34	
SM 2540C	Total Dissolved Solids	518	mg/L	20.0	06/05/20 17:41	
EPA 9040	pH at 25 Degrees C	10.1	Std. Units	0.10	06/05/20 07:34	H6
EPA 300.0	Chloride	241	mg/L	20.0	06/16/20 05:03	
EPA 300.0	Sulfate	23.9	mg/L	2.0	06/16/20 03:04	
40208801002	MW-02					
EPA 200.7	Boron	0.044J	mg/L	0.058	06/05/20 05:36	
EPA 200.7	Calcium	56.5	mg/L	0.50	06/05/20 05:36	
SM 2540C	Total Dissolved Solids	290	mg/L	20.0	06/05/20 17:41	
EPA 9040	pH at 25 Degrees C	8.0	Std. Units	0.10	06/05/20 07:36	H6
EPA 300.0	Chloride	65.2	mg/L	10.0	06/16/20 03:57	
EPA 300.0	Sulfate	23.1	mg/L	10.0	06/16/20 03:57	
40208801003	MW-03					
EPA 200.7	Boron	0.035J	mg/L	0.058	06/05/20 05:38	
EPA 200.7	Calcium	70.5	mg/L	0.50	06/05/20 05:38	
EPA 200.7	Iron	0.066J	mg/L	0.12	06/05/20 05:38	
SM 2540C	Total Dissolved Solids	396	mg/L	20.0	06/05/20 17:41	
EPA 9040	pH at 25 Degrees C	8.1	Std. Units	0.10	06/05/20 07:37	H6
EPA 300.0	Chloride	104	mg/L	10.0	06/16/20 08:59	
EPA 300.0	Sulfate	20.6	mg/L	2.0	06/15/20 15:03	
40208801004	MW-04					
EPA 200.7	Boron	0.096	mg/L	0.058	06/05/20 05:41	
EPA 200.7	Calcium	121	mg/L	0.50	06/05/20 05:41	
EPA 200.7	Iron	1.5	mg/L	0.12	06/05/20 05:41	
SM 2540C	Total Dissolved Solids	1020	mg/L	20.0	06/05/20 17:41	
EPA 9040	pH at 25 Degrees C	7.6	Std. Units	0.10	06/05/20 07:40	H6
EPA 300.0	Chloride	410	mg/L	40.0	06/16/20 09:12	
EPA 300.0	Sulfate	32.1	mg/L	2.0	06/15/20 15:56	
40208801005	MW-05					
EPA 200.7	Boron	0.038J	mg/L	0.058	06/05/20 05:43	
EPA 200.7	Calcium	159	mg/L	0.50	06/05/20 05:43	
EPA 200.7	Iron	0.097J	mg/L	0.12	06/05/20 05:43	
SM 2540C	Total Dissolved Solids	1120	mg/L	20.0	06/08/20 13:43	
EPA 9040	pH at 25 Degrees C	7.5	Std. Units	0.10	06/05/20 07:41	H6
EPA 300.0	Chloride	316	mg/L	40.0	06/16/20 09:25	
EPA 300.0	Sulfate	21.2	mg/L	2.0	06/15/20 16:09	
40208801006	FIELD BLANK					
SM 2540C	Total Dissolved Solids	26.0	mg/L	20.0	06/08/20 13:44	
EPA 9040	pH at 25 Degrees C	6.5	Std. Units	0.10	06/05/20 07:43	H6
EPA 300.0	Chloride	0.51J	mg/L	2.0	06/15/20 16:23	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

Sample: MW-01 **Lab ID: 40208801001** Collected: 06/03/20 09:51 Received: 06/04/20 10:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Green Bay									
Boron	0.064	mg/L	0.058	0.017	1	06/04/20 18:29	06/05/20 05:34	7440-42-8	
Calcium	83.9	mg/L	0.50	0.11	1	06/04/20 18:29	06/05/20 05:34	7440-70-2	
Iron	0.10J	mg/L	0.12	0.035	1	06/04/20 18:29	06/05/20 05:34	7439-89-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	518	mg/L	20.0	8.7	1		06/05/20 17:41		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	10.1	Std. Units	0.10	0.010	1		06/05/20 07:34		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	241	mg/L	20.0	4.3	10		06/16/20 05:03	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/16/20 03:04	16984-48-8	
Sulfate	23.9	mg/L	2.0	0.44	1		06/16/20 03:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

Sample: MW-02 **Lab ID: 40208801002** Collected: 06/03/20 11:20 Received: 06/04/20 10:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Green Bay									
Boron	0.044J	mg/L	0.058	0.017	1	06/04/20 18:29	06/05/20 05:36	7440-42-8	
Calcium	56.5	mg/L	0.50	0.11	1	06/04/20 18:29	06/05/20 05:36	7440-70-2	
Iron	<0.035	mg/L	0.12	0.035	1	06/04/20 18:29	06/05/20 05:36	7439-89-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	290	mg/L	20.0	8.7	1		06/05/20 17:41		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.0	Std. Units	0.10	0.010	1		06/05/20 07:36		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	65.2	mg/L	10.0	2.2	5		06/16/20 03:57	16887-00-6	
Fluoride	<0.48	mg/L	1.6	0.48	5		06/16/20 03:57	16984-48-8	D3
Sulfate	23.1	mg/L	10.0	2.2	5		06/16/20 03:57	14808-79-8	

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

Sample: MW-03 **Lab ID: 40208801003** Collected: 06/03/20 13:00 Received: 06/04/20 10:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Green Bay									
Boron	0.035J	mg/L	0.058	0.017	1	06/04/20 18:29	06/05/20 05:38	7440-42-8	
Calcium	70.5	mg/L	0.50	0.11	1	06/04/20 18:29	06/05/20 05:38	7440-70-2	
Iron	0.066J	mg/L	0.12	0.035	1	06/04/20 18:29	06/05/20 05:38	7439-89-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	396	mg/L	20.0	8.7	1		06/05/20 17:41		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.1	Std. Units	0.10	0.010	1		06/05/20 07:37		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	104	mg/L	10.0	2.2	5		06/16/20 08:59	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 15:03	16984-48-8	
Sulfate	20.6	mg/L	2.0	0.44	1		06/15/20 15:03	14808-79-8	

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

Sample: MW-04 **Lab ID: 40208801004** Collected: 06/03/20 19:58 Received: 06/04/20 10:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Green Bay									
Boron	0.096	mg/L	0.058	0.017	1	06/04/20 18:29	06/05/20 05:41	7440-42-8	
Calcium	121	mg/L	0.50	0.11	1	06/04/20 18:29	06/05/20 05:41	7440-70-2	
Iron	1.5	mg/L	0.12	0.035	1	06/04/20 18:29	06/05/20 05:41	7439-89-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	1020	mg/L	20.0	8.7	1		06/05/20 17:41		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		06/05/20 07:40		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	410	mg/L	40.0	8.6	20		06/16/20 09:12	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 15:56	16984-48-8	
Sulfate	32.1	mg/L	2.0	0.44	1		06/15/20 15:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

Sample: MW-05 **Lab ID: 40208801005** Collected: 06/03/20 20:40 Received: 06/04/20 10:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Green Bay									
Boron	0.038J	mg/L	0.058	0.017	1	06/04/20 18:29	06/05/20 05:43	7440-42-8	
Calcium	159	mg/L	0.50	0.11	1	06/04/20 18:29	06/05/20 05:43	7440-70-2	
Iron	0.097J	mg/L	0.12	0.035	1	06/04/20 18:29	06/05/20 05:43	7439-89-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	1120	mg/L	20.0	8.7	1		06/08/20 13:43		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		06/05/20 07:41		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	316	mg/L	40.0	8.6	20		06/16/20 09:25	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 16:09	16984-48-8	
Sulfate	21.2	mg/L	2.0	0.44	1		06/15/20 16:09	14808-79-8	

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

Sample: FIELD BLANK **Lab ID: 40208801006** Collected: 06/03/20 00:00 Received: 06/04/20 10:25 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Green Bay									
Boron	<0.017	mg/L	0.058	0.017	1	06/04/20 18:29	06/05/20 05:46	7440-42-8	
Calcium	<0.11	mg/L	0.50	0.11	1	06/04/20 18:29	06/05/20 05:46	7440-70-2	
Iron	<0.035	mg/L	0.12	0.035	1	06/04/20 18:29	06/05/20 05:46	7439-89-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	26.0	mg/L	20.0	8.7	1		06/08/20 13:44		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.5	Std. Units	0.10	0.010	1		06/05/20 07:43		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	0.51J	mg/L	2.0	0.43	1		06/15/20 16:23	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/15/20 16:23	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		06/15/20 16:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

QC Batch: 356743 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208801001, 40208801002, 40208801003, 40208801004, 40208801005, 40208801006

METHOD BLANK: 2063395 Matrix: Water
Associated Lab Samples: 40208801001, 40208801002, 40208801003, 40208801004, 40208801005, 40208801006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	mg/L	<0.017	0.058	0.017	06/05/20 04:42	
Calcium	mg/L	<0.11	0.50	0.11	06/05/20 04:42	
Iron	mg/L	<0.035	0.12	0.035	06/05/20 04:42	

LABORATORY CONTROL SAMPLE: 2063396

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	0.5	0.51	101	85-115	
Calcium	mg/L	5	5.3	105	85-115	
Iron	mg/L	5	5.0	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2063397 2063398

Parameter	Units	40208714001		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Boron	mg/L	70.5 ug/L	0.5	0.5	0.59	0.60	104	106	70-130	2	20		
Calcium	mg/L	32000 ug/L	5	5	35.9	37.1	78	103	70-130	3	20		
Iron	mg/L	1740 ug/L	5	5	6.9	6.9	103	103	70-130	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2063399 2063400

Parameter	Units	40208772001		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Boron	mg/L	0.32	0.5	0.5	0.85	0.85	104	106	70-130	1	20		
Calcium	mg/L	88.2	5	5	93.3	94.9	101	134	70-130	2	20 P6		
Iron	mg/L	2.8	5	5	7.7	7.9	98	103	70-130	3	20		

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

QC Batch: 356837 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208801001, 40208801002, 40208801003, 40208801004

METHOD BLANK: 2063999 Matrix: Water
Associated Lab Samples: 40208801001, 40208801002, 40208801003, 40208801004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	8.7	06/05/20 17:33	

LABORATORY CONTROL SAMPLE: 2064000

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	559	508	91	80-120	

SAMPLE DUPLICATE: 2064001

Parameter	Units	40208773015 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1110	1080	3	10	

SAMPLE DUPLICATE: 2064002

Parameter	Units	40208792001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1160	1200	3	10	

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

QC Batch: 356990	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40208801005, 40208801006

METHOD BLANK: 2064896 Matrix: Water

Associated Lab Samples: 40208801005, 40208801006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	8.7	06/08/20 13:42	

LABORATORY CONTROL SAMPLE: 2064897

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	559	558	100	80-120	

SAMPLE DUPLICATE: 2064898

Parameter	Units	40208801005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1120	1110	0	10	

SAMPLE DUPLICATE: 2064899

Parameter	Units	40208874001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	528	530	0	10	

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

QC Batch:	356765	Analysis Method:	EPA 9040
QC Batch Method:	EPA 9040	Analysis Description:	9040 pH
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40208801001, 40208801002, 40208801003, 40208801004, 40208801005, 40208801006

SAMPLE DUPLICATE: 2063445

Parameter	Units	40208714003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	9.1	9.1	0	20	H6

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

QC Batch: 356987 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40208801001, 40208801002

METHOD BLANK: 2064877 Matrix: Water
Associated Lab Samples: 40208801001, 40208801002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	0.43	06/15/20 20:54	
Fluoride	mg/L	<0.095	0.32	0.095	06/15/20 20:54	
Sulfate	mg/L	<0.44	2.0	0.44	06/15/20 20:54	

LABORATORY CONTROL SAMPLE: 2064878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	19.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064879 2064880

Parameter	Units	40208499001		MS		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result							
Chloride	mg/L	0.76J	20	20	20	21.1	20.4	102	98	90-110	3	15		
Fluoride	mg/L	<0.095	2	2	2	2.1	2.0	106	102	90-110	4	15		
Sulfate	mg/L	6.9	20	20	20	27.6	26.7	103	99	90-110	3	15		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064881 2064882

Parameter	Units	40208801002		MS		MSD		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result							
Chloride	mg/L	65.2	100	100	100	166	164	101	99	90-110	2	15		
Fluoride	mg/L	<0.48	10	10	10	10.2	10.1	102	101	90-110	1	15		
Sulfate	mg/L	23.1	100	100	100	122	121	99	98	90-110	1	15		

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

QC Batch: 357443 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40208801003, 40208801004, 40208801005, 40208801006

METHOD BLANK: 2067432 Matrix: Water
 Associated Lab Samples: 40208801003, 40208801004, 40208801005, 40208801006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	0.43	06/15/20 13:05	
Fluoride	mg/L	<0.095	0.32	0.095	06/15/20 13:05	
Sulfate	mg/L	<0.44	2.0	0.44	06/15/20 13:05	

LABORATORY CONTROL SAMPLE: 2067433

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.5	103	90-110	
Fluoride	mg/L	2	2.1	103	90-110	
Sulfate	mg/L	20	20.6	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2067434 2067435

Parameter	Units	40208559001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	38.5	100	100	118	136	80	98	90-110	14	15	M0
Fluoride	mg/L	1.7	10	10	9.5	11.4	77	97	90-110	19	15	M0, R1
Sulfate	mg/L	79.2	100	100	156	175	77	96	90-110	12	15	M0

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40208801

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

WORKORDER QUALIFIERS

WO: 40208801

[1] Samples were received at 14°C, outside the recommended temperature limits of 0-6 degrees Celsius. Analysis was completed upon client approval.

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40208801

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40208801001	MW-01	EPA 200.7	356743	EPA 200.7	356753
40208801002	MW-02	EPA 200.7	356743	EPA 200.7	356753
40208801003	MW-03	EPA 200.7	356743	EPA 200.7	356753
40208801004	MW-04	EPA 200.7	356743	EPA 200.7	356753
40208801005	MW-05	EPA 200.7	356743	EPA 200.7	356753
40208801006	FIELD BLANK	EPA 200.7	356743	EPA 200.7	356753
40208801001	MW-01	SM 2540C	356837		
40208801002	MW-02	SM 2540C	356837		
40208801003	MW-03	SM 2540C	356837		
40208801004	MW-04	SM 2540C	356837		
40208801005	MW-05	SM 2540C	356990		
40208801006	FIELD BLANK	SM 2540C	356990		
40208801001	MW-01	EPA 9040	356765		
40208801002	MW-02	EPA 9040	356765		
40208801003	MW-03	EPA 9040	356765		
40208801004	MW-04	EPA 9040	356765		
40208801005	MW-05	EPA 9040	356765		
40208801006	FIELD BLANK	EPA 9040	356765		
40208801001	MW-01	EPA 300.0	356987		
40208801002	MW-02	EPA 300.0	356987		
40208801003	MW-03	EPA 300.0	357443		
40208801004	MW-04	EPA 300.0	357443		
40208801005	MW-05	EPA 300.0	357443		
40208801006	FIELD BLANK	EPA 300.0	357443		

REPORT OF LABORATORY ANALYSIS

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Client Name: STEL Consultants

Sample Preservation Receipt Form

Project # 4008801

All containers needing preservation have been checked and noted below: Yes No N/A

Lab Lot# of pH paper: 1802791 Lab Sid #ID of preservation (if pH adjusted):

Initial when completed: MLK Date/Time:

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Pace Lab #	Glass			Plastic			Vials			Jars			General		VOA Vials (>6mm) *			Volume (mL)							
	AG1U	BG1U	AG1H	BP1U	BP3U	BP3B	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T		ZPLC	GN	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted
001																									2.5 / 5 / 10
002																									2.5 / 5 / 10
003																									2.5 / 5 / 10
004																									2.5 / 5 / 10
005																									2.5 / 5 / 10
006																									2.5 / 5 / 10
007																									2.5 / 5 / 10
008																									2.5 / 5 / 10
009																									2.5 / 5 / 10
010																									2.5 / 5 / 10
011																									2.5 / 5 / 10
012																									2.5 / 5 / 10
013																									2.5 / 5 / 10
014																									2.5 / 5 / 10
015																									2.5 / 5 / 10
016																									2.5 / 5 / 10
017																									2.5 / 5 / 10
018																									2.5 / 5 / 10
019																									2.5 / 5 / 10
020																									2.5 / 5 / 10


Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (<6mm): Yes No N/A *If yes look in headspace column

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG4U	120 mL amber glass unpres
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4

VG9A	40 mL clear ascorbic
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN	

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 26Mar2020
	Document No.: ENV-FRM-GBAY-0014-Rev.00	Author: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: GEI Consultants

Project #:

WO#: 40208801

Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____



Tracking #: 1Z W03 54Y 03 9762 9250

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR-24 Type of Ice: Wet Blue Dry None Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 14°C / Corr: 14°C

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 6-4-20 / Initials: MCK

Temp should be above freezing to 6°C.

Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Labeled By Initials: [Signature]

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	2. <u>OOB date/time, collection year MCK 6-4-20</u>
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>IDs "MW-#" except OOB, O04 time "1953", O05 no time, O06 date "6/3/20"</u>
-Includes date/time/ID/Analysis Matrix: <u>W</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <u>9 Time "1400", year on all BP3s "20"</u>
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		<u>MCK 6-4-20</u>

Client Notification/ Resolution:

If checked, see attached form for additional comments

Person Contacted: Travis Anderson Date/Time: 06/04/2020

Comments/ Resolution: (1) notified PM, PM would proceed w/ area MCK 6-4-20

Client approved analysis of overtemp samples. 6/4/2020 CDH

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logir

September 02, 2020

Travis Anderson
GEI Consultants, Inc
109 W. Baraga Avenue
Marquette, MI 49855

RE: Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

Dear Travis Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on August 22, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Christopher Hyska
christopher.hyska@pacelabs.com
(920)469-2436
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40213414001	MW-01	Water	08/20/20 17:10	08/22/20 14:45
40213414002	MW-02	Water	08/20/20 18:00	08/22/20 14:45
40213414003	MW-03	Water	08/20/20 18:45	08/22/20 14:45
40213414004	MW-04	Water	08/20/20 14:25	08/22/20 14:45
40213414005	MW-05	Water	08/20/20 13:50	08/22/20 14:45
40213414006	FIELD BLANK	Water	08/20/20 00:00	08/22/20 14:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40213414001	MW-01	EPA 200.7	TXW	3
		EPA 200.8	KXS	12
		EPA 245.1	AJT	1
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40213414002	MW-02	EPA 200.7	TXW	3
		EPA 200.8	KXS	12
		EPA 245.1	AJT	1
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40213414003	MW-03	EPA 200.7	TXW	3
		EPA 200.8	KXS	12
		EPA 245.1	AJT	1
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40213414004	MW-04	EPA 200.7	TXW	3
		EPA 200.8	KXS	12
		EPA 245.1	AJT	1
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40213414005	MW-05	EPA 200.7	TXW	3
		EPA 200.8	KXS	12
		EPA 245.1	AJT	1
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40213414006	FIELD BLANK	EPA 200.7	TXW	3
		EPA 200.8	KXS	12
		EPA 245.1	AJT	1
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

Lab ID	Sample ID	Method	Analysts	Analytes Reported
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PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40213414001	MW-01					
EPA 200.7	Boron	0.021J	mg/L	0.058	08/25/20 17:42	
EPA 200.7	Calcium	37.0	mg/L	0.50	08/25/20 17:42	
EPA 200.7	Iron	0.11J	mg/L	0.12	08/25/20 17:42	
EPA 200.8	Arsenic	0.0012	mg/L	0.0010	08/29/20 07:32	
EPA 200.8	Barium	0.060	mg/L	0.0023	08/29/20 07:32	
EPA 200.8	Lithium	0.0080	mg/L	0.0010	08/29/20 07:32	
EPA 200.8	Molybdenum	0.00092J	mg/L	0.0015	08/29/20 07:32	
SM 2540C	Total Dissolved Solids	276	mg/L	20.0	08/24/20 12:55	
EPA 9040	pH at 25 Degrees C	8.1	Std. Units	0.10	08/27/20 08:56	H6
EPA 300.0	Chloride	86.7	mg/L	20.0	08/27/20 18:50	
EPA 300.0	Sulfate	10.4	mg/L	2.0	08/27/20 16:12	M0
40213414002	MW-02					
EPA 200.7	Boron	0.14	mg/L	0.058	08/25/20 17:44	
EPA 200.7	Calcium	55.1	mg/L	0.50	08/25/20 17:44	
EPA 200.7	Iron	0.15	mg/L	0.12	08/25/20 17:44	
EPA 200.8	Arsenic	0.0018	mg/L	0.0010	08/29/20 07:05	
EPA 200.8	Barium	0.075	mg/L	0.0023	08/29/20 07:05	
EPA 200.8	Lithium	0.0064	mg/L	0.0010	08/29/20 07:05	
EPA 200.8	Molybdenum	0.0033	mg/L	0.0015	08/29/20 07:05	
SM 2540C	Total Dissolved Solids	336	mg/L	20.0	08/24/20 12:55	
EPA 9040	pH at 25 Degrees C	8.0	Std. Units	0.10	08/27/20 08:58	H6
EPA 300.0	Chloride	66.0	mg/L	10.0	08/27/20 20:16	
EPA 300.0	Fluoride	0.11J	mg/L	0.32	08/27/20 17:38	
EPA 300.0	Sulfate	48.7	mg/L	2.0	08/27/20 17:38	
40213414003	MW-03					
EPA 200.7	Boron	0.037J	mg/L	0.058	08/25/20 17:47	
EPA 200.7	Calcium	66.2	mg/L	0.50	08/25/20 17:47	
EPA 200.8	Arsenic	0.0013	mg/L	0.0010	08/29/20 08:07	
EPA 200.8	Barium	0.12	mg/L	0.0023	08/29/20 08:07	
EPA 200.8	Lithium	0.0076	mg/L	0.0010	08/29/20 08:07	
EPA 200.8	Molybdenum	0.0011J	mg/L	0.0015	08/29/20 08:07	
SM 2540C	Total Dissolved Solids	404	mg/L	20.0	08/24/20 12:55	
EPA 9040	pH at 25 Degrees C	8.1	Std. Units	0.10	08/27/20 08:58	H6
EPA 300.0	Chloride	104	mg/L	10.0	08/27/20 20:31	
EPA 300.0	Sulfate	27.0	mg/L	2.0	08/28/20 12:29	
40213414004	MW-04					
EPA 200.7	Boron	0.077	mg/L	0.058	08/25/20 17:49	
EPA 200.7	Calcium	109	mg/L	0.50	08/25/20 17:49	
EPA 200.7	Iron	1.8	mg/L	0.12	08/25/20 17:49	
EPA 200.8	Antimony	0.00021J	mg/L	0.0010	08/29/20 08:14	
EPA 200.8	Arsenic	0.0023	mg/L	0.0010	08/29/20 08:14	
EPA 200.8	Barium	0.11	mg/L	0.0023	08/29/20 08:14	
EPA 200.8	Cobalt	0.00014J	mg/L	0.0010	08/29/20 08:14	
EPA 200.8	Lead	0.00033J	mg/L	0.0010	08/29/20 08:14	
EPA 200.8	Lithium	0.0095	mg/L	0.0010	08/29/20 08:14	
EPA 200.8	Molybdenum	0.013	mg/L	0.0015	08/29/20 08:14	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40213414004	MW-04					
SM 2540C	Total Dissolved Solids	1020	mg/L	20.0	08/24/20 12:56	
EPA 9040	pH at 25 Degrees C	7.7	Std. Units	0.10	08/27/20 09:00	H6
EPA 300.0	Chloride	420	mg/L	40.0	08/27/20 20:45	
EPA 300.0	Sulfate	35.9	mg/L	2.0	08/27/20 18:07	
40213414005	MW-05					
EPA 200.7	Boron	0.026J	mg/L	0.058	08/25/20 17:52	
EPA 200.7	Calcium	164	mg/L	0.50	08/25/20 17:52	P6
EPA 200.8	Arsenic	0.00068J	mg/L	0.0010	08/29/20 08:21	
EPA 200.8	Barium	0.16	mg/L	0.0023	08/29/20 08:21	
EPA 200.8	Chromium	0.0012J	mg/L	0.0034	08/29/20 08:21	
EPA 200.8	Lithium	0.013	mg/L	0.0010	08/29/20 08:21	
EPA 200.8	Molybdenum	0.0014J	mg/L	0.0015	08/29/20 08:21	
EPA 200.8	Selenium	0.00043J	mg/L	0.0011	08/29/20 08:21	
SM 2540C	Total Dissolved Solids	1210	mg/L	20.0	08/24/20 12:56	
EPA 9040	pH at 25 Degrees C	7.5	Std. Units	0.10	08/27/20 09:01	H6
EPA 300.0	Chloride	400	mg/L	40.0	08/27/20 21:00	
EPA 300.0	Sulfate	26.3	mg/L	2.0	08/27/20 18:21	
40213414006	FIELD BLANK					
SM 2540C	Total Dissolved Solids	28.0	mg/L	20.0	08/24/20 12:56	
EPA 9040	pH at 25 Degrees C	6.7	Std. Units	0.10	08/27/20 09:03	H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
 Pace Project No.: 40213414

Sample: MW-01 **Lab ID: 40213414001** Collected: 08/20/20 17:10 Received: 08/22/20 14:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Green Bay									
Boron	0.021J	mg/L	0.058	0.017	1	08/25/20 05:10	08/25/20 17:42	7440-42-8	
Calcium	37.0	mg/L	0.50	0.11	1	08/25/20 05:10	08/25/20 17:42	7440-70-2	
Iron	0.11J	mg/L	0.12	0.035	1	08/25/20 05:10	08/25/20 17:42	7439-89-6	
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Pace Analytical Services - Green Bay									
Antimony	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 07:32	7440-36-0	
Arsenic	0.0012	mg/L	0.0010	0.00028	1	08/27/20 05:29	08/29/20 07:32	7440-38-2	
Barium	0.060	mg/L	0.0023	0.00070	1	08/27/20 05:29	08/29/20 07:32	7440-39-3	
Beryllium	<0.00025	mg/L	0.0010	0.00025	1	08/27/20 05:29	08/29/20 07:32	7440-41-7	
Cadmium	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 07:32	7440-43-9	
Chromium	<0.0010	mg/L	0.0034	0.0010	1	08/27/20 05:29	08/29/20 07:32	7440-47-3	
Cobalt	<0.00012	mg/L	0.0010	0.00012	1	08/27/20 05:29	08/29/20 07:32	7440-48-4	
Lead	<0.00024	mg/L	0.0010	0.00024	1	08/27/20 05:29	08/29/20 07:32	7439-92-1	
Lithium	0.0080	mg/L	0.0010	0.00022	1	08/27/20 05:29	08/29/20 07:32	7439-93-2	
Molybdenum	0.00092J	mg/L	0.0015	0.00044	1	08/27/20 05:29	08/29/20 07:32	7439-98-7	
Selenium	<0.00032	mg/L	0.0011	0.00032	1	08/27/20 05:29	08/29/20 07:32	7782-49-2	
Thallium	<0.00014	mg/L	0.0010	0.00014	1	08/27/20 05:29	08/29/20 07:32	7440-28-0	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1									
Pace Analytical Services - Green Bay									
Mercury	<0.000066	mg/L	0.00020	0.000066	1	08/27/20 10:00	08/28/20 08:31	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	276	mg/L	20.0	8.7	1		08/24/20 12:55		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.1	Std. Units	0.10	0.010	1		08/27/20 08:56		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	86.7	mg/L	20.0	4.3	10		08/27/20 18:50	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/27/20 16:12	16984-48-8	
Sulfate	10.4	mg/L	2.0	0.44	1		08/27/20 16:12	14808-79-8	M0

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

Sample: MW-02 **Lab ID: 40213414002** Collected: 08/20/20 18:00 Received: 08/22/20 14:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Green Bay									
Boron	0.14	mg/L	0.058	0.017	1	08/25/20 05:10	08/25/20 17:44	7440-42-8	
Calcium	55.1	mg/L	0.50	0.11	1	08/25/20 05:10	08/25/20 17:44	7440-70-2	
Iron	0.15	mg/L	0.12	0.035	1	08/25/20 05:10	08/25/20 17:44	7439-89-6	
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 Pace Analytical Services - Green Bay									
Antimony	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 07:05	7440-36-0	
Arsenic	0.0018	mg/L	0.0010	0.00028	1	08/27/20 05:29	08/29/20 07:05	7440-38-2	
Barium	0.075	mg/L	0.0023	0.00070	1	08/27/20 05:29	08/29/20 07:05	7440-39-3	
Beryllium	<0.00025	mg/L	0.0010	0.00025	1	08/27/20 05:29	08/29/20 07:05	7440-41-7	
Cadmium	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 07:05	7440-43-9	
Chromium	<0.0010	mg/L	0.0034	0.0010	1	08/27/20 05:29	08/29/20 07:05	7440-47-3	
Cobalt	<0.00012	mg/L	0.0010	0.00012	1	08/27/20 05:29	08/29/20 07:05	7440-48-4	
Lead	<0.00024	mg/L	0.0010	0.00024	1	08/27/20 05:29	08/29/20 07:05	7439-92-1	
Lithium	0.0064	mg/L	0.0010	0.00022	1	08/27/20 05:29	08/29/20 07:05	7439-93-2	
Molybdenum	0.0033	mg/L	0.0015	0.00044	1	08/27/20 05:29	08/29/20 07:05	7439-98-7	
Selenium	<0.00032	mg/L	0.0011	0.00032	1	08/27/20 05:29	08/29/20 07:05	7782-49-2	
Thallium	<0.00014	mg/L	0.0010	0.00014	1	08/27/20 05:29	08/29/20 07:05	7440-28-0	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1 Pace Analytical Services - Green Bay									
Mercury	<0.000066	mg/L	0.00020	0.000066	1	08/27/20 10:00	08/28/20 08:39	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	336	mg/L	20.0	8.7	1		08/24/20 12:55		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.0	Std. Units	0.10	0.010	1		08/27/20 08:58		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	66.0	mg/L	10.0	2.2	5		08/27/20 20:16	16887-00-6	
Fluoride	0.11J	mg/L	0.32	0.095	1		08/27/20 17:38	16984-48-8	
Sulfate	48.7	mg/L	2.0	0.44	1		08/27/20 17:38	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Project No.: 40213414

Sample: MW-03 **Lab ID: 40213414003** Collected: 08/20/20 18:45 Received: 08/22/20 14:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Green Bay									
Boron	0.037J	mg/L	0.058	0.017	1	08/25/20 05:10	08/25/20 17:47	7440-42-8	
Calcium	66.2	mg/L	0.50	0.11	1	08/25/20 05:10	08/25/20 17:47	7440-70-2	
Iron	<0.035	mg/L	0.12	0.035	1	08/25/20 05:10	08/25/20 17:47	7439-89-6	
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Pace Analytical Services - Green Bay									
Antimony	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 08:07	7440-36-0	
Arsenic	0.0013	mg/L	0.0010	0.00028	1	08/27/20 05:29	08/29/20 08:07	7440-38-2	
Barium	0.12	mg/L	0.0023	0.00070	1	08/27/20 05:29	08/29/20 08:07	7440-39-3	
Beryllium	<0.00025	mg/L	0.0010	0.00025	1	08/27/20 05:29	08/29/20 08:07	7440-41-7	
Cadmium	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 08:07	7440-43-9	
Chromium	<0.0010	mg/L	0.0034	0.0010	1	08/27/20 05:29	08/29/20 08:07	7440-47-3	
Cobalt	<0.00012	mg/L	0.0010	0.00012	1	08/27/20 05:29	08/29/20 08:07	7440-48-4	
Lead	<0.00024	mg/L	0.0010	0.00024	1	08/27/20 05:29	08/29/20 08:07	7439-92-1	
Lithium	0.0076	mg/L	0.0010	0.00022	1	08/27/20 05:29	08/29/20 08:07	7439-93-2	
Molybdenum	0.0011J	mg/L	0.0015	0.00044	1	08/27/20 05:29	08/29/20 08:07	7439-98-7	
Selenium	<0.00032	mg/L	0.0011	0.00032	1	08/27/20 05:29	08/29/20 08:07	7782-49-2	
Thallium	<0.00014	mg/L	0.0010	0.00014	1	08/27/20 05:29	08/29/20 08:07	7440-28-0	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1									
Pace Analytical Services - Green Bay									
Mercury	<0.000066	mg/L	0.00020	0.000066	1	08/27/20 10:00	08/28/20 08:41	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	404	mg/L	20.0	8.7	1		08/24/20 12:55		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.1	Std. Units	0.10	0.010	1		08/27/20 08:58		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	104	mg/L	10.0	2.2	5		08/27/20 20:31	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/28/20 12:29	16984-48-8	
Sulfate	27.0	mg/L	2.0	0.44	1		08/28/20 12:29	14808-79-8	

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
 Pace Project No.: 40213414

Sample: MW-04 **Lab ID: 40213414004** Collected: 08/20/20 14:25 Received: 08/22/20 14:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Green Bay									
Boron	0.077	mg/L	0.058	0.017	1	08/25/20 05:10	08/25/20 17:49	7440-42-8	
Calcium	109	mg/L	0.50	0.11	1	08/25/20 05:10	08/25/20 17:49	7440-70-2	
Iron	1.8	mg/L	0.12	0.035	1	08/25/20 05:10	08/25/20 17:49	7439-89-6	
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 Pace Analytical Services - Green Bay									
Antimony	0.00021J	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 08:14	7440-36-0	
Arsenic	0.0023	mg/L	0.0010	0.00028	1	08/27/20 05:29	08/29/20 08:14	7440-38-2	
Barium	0.11	mg/L	0.0023	0.00070	1	08/27/20 05:29	08/29/20 08:14	7440-39-3	
Beryllium	<0.00025	mg/L	0.0010	0.00025	1	08/27/20 05:29	08/29/20 08:14	7440-41-7	
Cadmium	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 08:14	7440-43-9	
Chromium	<0.0010	mg/L	0.0034	0.0010	1	08/27/20 05:29	08/29/20 08:14	7440-47-3	
Cobalt	0.00014J	mg/L	0.0010	0.00012	1	08/27/20 05:29	08/29/20 08:14	7440-48-4	
Lead	0.00033J	mg/L	0.0010	0.00024	1	08/27/20 05:29	08/29/20 08:14	7439-92-1	
Lithium	0.0095	mg/L	0.0010	0.00022	1	08/27/20 05:29	08/29/20 08:14	7439-93-2	
Molybdenum	0.013	mg/L	0.0015	0.00044	1	08/27/20 05:29	08/29/20 08:14	7439-98-7	
Selenium	<0.00032	mg/L	0.0011	0.00032	1	08/27/20 05:29	08/29/20 08:14	7782-49-2	
Thallium	<0.00014	mg/L	0.0010	0.00014	1	08/27/20 05:29	08/29/20 08:14	7440-28-0	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1 Pace Analytical Services - Green Bay									
Mercury	<0.000066	mg/L	0.00020	0.000066	1	08/27/20 10:00	08/28/20 08:43	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	1020	mg/L	20.0	8.7	1		08/24/20 12:56		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.7	Std. Units	0.10	0.010	1		08/27/20 09:00		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	420	mg/L	40.0	8.6	20		08/27/20 20:45	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/27/20 18:07	16984-48-8	
Sulfate	35.9	mg/L	2.0	0.44	1		08/27/20 18:07	14808-79-8	

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
 Pace Project No.: 40213414

Sample: MW-05 **Lab ID: 40213414005** Collected: 08/20/20 13:50 Received: 08/22/20 14:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Green Bay									
Boron	0.026J	mg/L	0.058	0.017	1	08/25/20 05:10	08/25/20 17:52	7440-42-8	
Calcium	164	mg/L	0.50	0.11	1	08/25/20 05:10	08/25/20 17:52	7440-70-2	P6
Iron	<0.035	mg/L	0.12	0.035	1	08/25/20 05:10	08/25/20 17:52	7439-89-6	
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 Pace Analytical Services - Green Bay									
Antimony	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 08:21	7440-36-0	
Arsenic	0.00068J	mg/L	0.0010	0.00028	1	08/27/20 05:29	08/29/20 08:21	7440-38-2	
Barium	0.16	mg/L	0.0023	0.00070	1	08/27/20 05:29	08/29/20 08:21	7440-39-3	
Beryllium	<0.00025	mg/L	0.0010	0.00025	1	08/27/20 05:29	08/29/20 08:21	7440-41-7	
Cadmium	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 08:21	7440-43-9	
Chromium	0.0012J	mg/L	0.0034	0.0010	1	08/27/20 05:29	08/29/20 08:21	7440-47-3	
Cobalt	<0.00012	mg/L	0.0010	0.00012	1	08/27/20 05:29	08/29/20 08:21	7440-48-4	
Lead	<0.00024	mg/L	0.0010	0.00024	1	08/27/20 05:29	08/29/20 08:21	7439-92-1	
Lithium	0.013	mg/L	0.0010	0.00022	1	08/27/20 05:29	08/29/20 08:21	7439-93-2	
Molybdenum	0.0014J	mg/L	0.0015	0.00044	1	08/27/20 05:29	08/29/20 08:21	7439-98-7	
Selenium	0.00043J	mg/L	0.0011	0.00032	1	08/27/20 05:29	08/29/20 08:21	7782-49-2	
Thallium	<0.00014	mg/L	0.0010	0.00014	1	08/27/20 05:29	08/29/20 08:21	7440-28-0	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1 Pace Analytical Services - Green Bay									
Mercury	<0.000066	mg/L	0.00020	0.000066	1	08/27/20 10:00	08/28/20 08:46	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	1210	mg/L	20.0	8.7	1		08/24/20 12:56		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		08/27/20 09:01		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	400	mg/L	40.0	8.6	20		08/27/20 21:00	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/27/20 18:21	16984-48-8	
Sulfate	26.3	mg/L	2.0	0.44	1		08/27/20 18:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

Sample: FIELD BLANK **Lab ID: 40213414006** Collected: 08/20/20 00:00 Received: 08/22/20 14:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Green Bay									
Boron	<0.017	mg/L	0.058	0.017	1	08/25/20 05:10	08/25/20 18:01	7440-42-8	
Calcium	<0.11	mg/L	0.50	0.11	1	08/25/20 05:10	08/25/20 18:01	7440-70-2	
Iron	<0.035	mg/L	0.12	0.035	1	08/25/20 05:10	08/25/20 18:01	7439-89-6	
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Pace Analytical Services - Green Bay									
Antimony	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 06:23	7440-36-0	
Arsenic	<0.00028	mg/L	0.0010	0.00028	1	08/27/20 05:29	08/29/20 06:23	7440-38-2	
Barium	<0.00070	mg/L	0.0023	0.00070	1	08/27/20 05:29	08/29/20 06:23	7440-39-3	
Beryllium	<0.00025	mg/L	0.0010	0.00025	1	08/27/20 05:29	08/29/20 06:23	7440-41-7	
Cadmium	<0.00015	mg/L	0.0010	0.00015	1	08/27/20 05:29	08/29/20 06:23	7440-43-9	
Chromium	<0.0010	mg/L	0.0034	0.0010	1	08/27/20 05:29	08/29/20 06:23	7440-47-3	
Cobalt	<0.00012	mg/L	0.0010	0.00012	1	08/27/20 05:29	08/29/20 06:23	7440-48-4	
Lead	<0.00024	mg/L	0.0010	0.00024	1	08/27/20 05:29	08/29/20 06:23	7439-92-1	
Lithium	<0.00022	mg/L	0.0010	0.00022	1	08/27/20 05:29	08/29/20 06:23	7439-93-2	
Molybdenum	<0.00044	mg/L	0.0015	0.00044	1	08/27/20 05:29	08/29/20 06:23	7439-98-7	
Selenium	<0.00032	mg/L	0.0011	0.00032	1	08/27/20 05:29	08/29/20 06:23	7782-49-2	
Thallium	<0.00014	mg/L	0.0010	0.00014	1	08/27/20 05:29	08/29/20 06:23	7440-28-0	
245.1 Mercury									
Analytical Method: EPA 245.1 Preparation Method: EPA 245.1									
Pace Analytical Services - Green Bay									
Mercury	<0.000066	mg/L	0.00020	0.000066	1	08/27/20 10:00	08/28/20 08:48	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	28.0	mg/L	20.0	8.7	1		08/24/20 12:56		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.7	Std. Units	0.10	0.010	1		08/27/20 09:03		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		08/27/20 18:36	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/27/20 18:36	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		08/27/20 18:36	14808-79-8	

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

QC Batch:	363989	Analysis Method:	EPA 245.1
QC Batch Method:	EPA 245.1	Analysis Description:	245.1 Mercury
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

METHOD BLANK: 2103940 Matrix: Water
Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/L	<0.000066	0.00020	0.000066	08/28/20 08:27	

LABORATORY CONTROL SAMPLE: 2103941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.005	0.0052	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2103942 2103943

Parameter	Units	2103942		2103943		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Mercury	mg/L	<0.000066	0.005	0.0052	0.0051	103	101	70-130	2	20	

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

QC Batch: 363736 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

METHOD BLANK: 2102425 Matrix: Water
Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	mg/L	<0.017	0.058	0.017	08/25/20 17:03	
Calcium	mg/L	<0.11	0.50	0.11	08/25/20 17:03	
Iron	mg/L	<0.035	0.12	0.035	08/25/20 17:03	

LABORATORY CONTROL SAMPLE: 2102426

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	mg/L	0.5	0.46	92	85-115	
Calcium	mg/L	5	5.0	101	85-115	
Iron	mg/L	5	5.0	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2102427 2102428

Parameter	Units	40213360002 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Boron	mg/L	44.3J ug/L	0.5	0.5	0.48	0.51	88	93	70-130	5	20	
Calcium	mg/L	23700 ug/L	5	5	27.4	29.9	73	124	70-130	9	20	
Iron	mg/L	860 ug/L	5	5	5.3	6.0	89	103	70-130	12	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2102429 2102430

Parameter	Units	40213414005 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Boron	mg/L	0.026J	0.5	0.5	0.53	0.53	101	100	70-130	1	20	
Calcium	mg/L	164	5	5	175	176	208	236	70-130	1	20 P6	
Iron	mg/L	<0.035	5	5	5.2	5.1	104	103	70-130	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

QC Batch: 363961 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

METHOD BLANK: 2103817 Matrix: Water
Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	mg/L	<0.00015	0.0010	0.00015	08/29/20 06:16	
Arsenic	mg/L	<0.00028	0.0010	0.00028	08/29/20 06:16	
Barium	mg/L	<0.00070	0.0023	0.00070	08/29/20 06:16	
Beryllium	mg/L	<0.00025	0.0010	0.00025	08/29/20 06:16	
Cadmium	mg/L	<0.00015	0.0010	0.00015	08/29/20 06:16	
Chromium	mg/L	<0.0010	0.0034	0.0010	08/29/20 06:16	
Cobalt	mg/L	<0.00012	0.0010	0.00012	08/29/20 06:16	
Lead	mg/L	<0.00024	0.0010	0.00024	08/29/20 06:16	
Lithium	mg/L	<0.00022	0.0010	0.00022	08/29/20 06:16	
Molybdenum	mg/L	<0.00044	0.0015	0.00044	08/29/20 06:16	
Selenium	mg/L	<0.00032	0.0011	0.00032	08/29/20 06:16	
Thallium	mg/L	<0.00014	0.0010	0.00014	08/29/20 06:16	

LABORATORY CONTROL SAMPLE: 2103818

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	mg/L	0.5	0.52	105	85-115	
Arsenic	mg/L	0.5	0.52	104	85-115	
Barium	mg/L	0.5	0.50	100	85-115	
Beryllium	mg/L	0.5	0.52	104	85-115	
Cadmium	mg/L	0.5	0.54	108	85-115	
Chromium	mg/L	0.5	0.49	99	85-115	
Cobalt	mg/L	0.5	0.49	98	85-115	
Lead	mg/L	0.5	0.46	92	85-115	
Lithium	mg/L	0.5	0.47	95	85-115	
Molybdenum	mg/L	0.5	0.52	103	85-115	
Selenium	mg/L	0.5	0.54	108	85-115	
Thallium	mg/L	0.5	0.46	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2103819 2103820

Parameter	Units	2103819		2103820		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Antimony	mg/L	<0.00015	0.5	0.5	0.52	0.52	104	104	75-125	0	20	
Arsenic	mg/L	0.0012	0.5	0.5	0.52	0.51	103	102	75-125	1	20	
Barium	mg/L	0.060	0.5	0.5	0.56	0.56	100	100	75-125	0	20	
Beryllium	mg/L	<0.00025	0.5	0.5	0.51	0.50	102	101	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2103819		2103820		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		40213414001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Cadmium	mg/L	<0.00015	0.5	0.5	0.52	0.52	105	105	75-125	0	20		
Chromium	mg/L	<0.0010	0.5	0.5	0.50	0.49	99	98	75-125	1	20		
Cobalt	mg/L	<0.00012	0.5	0.5	0.49	0.49	98	97	75-125	1	20		
Lead	mg/L	<0.00024	0.5	0.5	0.49	0.46	97	92	75-125	6	20		
Lithium	mg/L	0.0080	0.5	0.5	0.49	0.48	97	95	75-125	1	20		
Molybdenum	mg/L	0.00092J	0.5	0.5	0.52	0.51	104	103	75-125	1	20		
Selenium	mg/L	<0.00032	0.5	0.5	0.53	0.52	105	104	75-125	1	20		
Thallium	mg/L	<0.00014	0.5	0.5	0.47	0.46	95	92	75-125	3	20		

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

QC Batch:	363674	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

METHOD BLANK: 2102254 Matrix: Water
Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	8.7	08/24/20 12:54	

LABORATORY CONTROL SAMPLE: 2102255

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	563	558	99	80-120	

SAMPLE DUPLICATE: 2102256

Parameter	Units	40213382001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	268	276	3	10	

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

QC Batch: 363977

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

SAMPLE DUPLICATE: 2103867

Parameter	Units	40213414001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.1	8.2	1	20	H6

SAMPLE DUPLICATE: 2103868

Parameter	Units	40213458005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.5	1	20	H6

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QUALITY CONTROL DATA

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40213414

QC Batch: 364013 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

METHOD BLANK: 2104052 Matrix: Water
Associated Lab Samples: 40213414001, 40213414002, 40213414003, 40213414004, 40213414005, 40213414006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.72J	2.0	0.43	08/27/20 15:43	
Fluoride	mg/L	<0.095	0.32	0.095	08/27/20 15:43	
Sulfate	mg/L	<0.44	2.0	0.44	08/27/20 15:43	

LABORATORY CONTROL SAMPLE: 2104053

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.3	102	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	20.2	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2104054 2104055

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40213414001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	86.7	200	200	296	298	105	106	90-110	1	15		
Fluoride	mg/L	<0.095	2	2	2.2	2.2	107	107	90-110	0	15		
Sulfate	mg/L	10.4	20	20	32.5	32.4	111	110	90-110	0	15	M0	

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QUALIFIERS

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40213414

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40213414001	MW-01	EPA 200.7	363736	EPA 200.7	363782
40213414002	MW-02	EPA 200.7	363736	EPA 200.7	363782
40213414003	MW-03	EPA 200.7	363736	EPA 200.7	363782
40213414004	MW-04	EPA 200.7	363736	EPA 200.7	363782
40213414005	MW-05	EPA 200.7	363736	EPA 200.7	363782
40213414006	FIELD BLANK	EPA 200.7	363736	EPA 200.7	363782
40213414001	MW-01	EPA 200.8	363961	EPA 200.8	364038
40213414002	MW-02	EPA 200.8	363961	EPA 200.8	364038
40213414003	MW-03	EPA 200.8	363961	EPA 200.8	364038
40213414004	MW-04	EPA 200.8	363961	EPA 200.8	364038
40213414005	MW-05	EPA 200.8	363961	EPA 200.8	364038
40213414006	FIELD BLANK	EPA 200.8	363961	EPA 200.8	364038
40213414001	MW-01	EPA 245.1	363989	EPA 245.1	364027
40213414002	MW-02	EPA 245.1	363989	EPA 245.1	364027
40213414003	MW-03	EPA 245.1	363989	EPA 245.1	364027
40213414004	MW-04	EPA 245.1	363989	EPA 245.1	364027
40213414005	MW-05	EPA 245.1	363989	EPA 245.1	364027
40213414006	FIELD BLANK	EPA 245.1	363989	EPA 245.1	364027
40213414001	MW-01	SM 2540C	363674		
40213414002	MW-02	SM 2540C	363674		
40213414003	MW-03	SM 2540C	363674		
40213414004	MW-04	SM 2540C	363674		
40213414005	MW-05	SM 2540C	363674		
40213414006	FIELD BLANK	SM 2540C	363674		
40213414001	MW-01	EPA 9040	363977		
40213414002	MW-02	EPA 9040	363977		
40213414003	MW-03	EPA 9040	363977		
40213414004	MW-04	EPA 9040	363977		
40213414005	MW-05	EPA 9040	363977		
40213414006	FIELD BLANK	EPA 9040	363977		
40213414001	MW-01	EPA 300.0	364013		
40213414002	MW-02	EPA 300.0	364013		
40213414003	MW-03	EPA 300.0	364013		
40213414004	MW-04	EPA 300.0	364013		
40213414005	MW-05	EPA 300.0	364013		
40213414006	FIELD BLANK	EPA 300.0	364013		

REPORT OF LABORATORY ANALYSIS

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(Please Print Clearly)

UPPER MIDWEST REGION

MN: 612-607-1700 WI: 920-469-2436

Page 1 of 1



CHAIN OF CUSTODY

A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
 H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

COC No. 40213414

Company Name: GEI Consultants
Branch/Location: Marquette, MI
Project Contact: Travis Anderson
Phone: (906) 290-0723
Project Number: 1903625
Project Name: MBLP CCR Impoundment GW
Project State: MI
Sampled By (Print): Travis Anderson
Sampled By (Sign): *[Signature]*
PO #: N/A
Regulatory Program:

PAGE LAB #	CLIENT FIELD ID	COLLECTION DATE	TIME	MATRIX	Analyses Requested		
					Y/N	Pick Letter	
001	MMW-01	8/20	1710	GW	X	D	Boron, Calcium, Iron 1*
002	MMW-02	8/20	1800	GW	X	A	TDS, pH
003	MMW-03	8/20	1845	GW	X	A	Cl, F, SO4
004	MMW-04	8/20	1425	GW	X		
005	MMW-05	8/20	1350	GW	X		
006	FIELD BLANK			W	X		

Data Package Options
 EPA Level III
 EPA Level IV
 On your sample (billable)
 NOT needed on your sample

Matrix Codes
 A = Air B = Biota C = Charcoal O = Oil S = Soil SI = Sludge
 W = Water DW = Drinking Water GW = Ground Water SW = Surface Water WP = Waste Water

Filtered? (YES/NO)
Preservation (CODE)*

Rush Turnaround Time Requested - Prelims
 (Rush TAT subject to approval/surcharge)
 Date Needed:

Transmit Prelim Rush Results by (complete what you want):
 Email #1: *[Signature]*
 Email #2:
 Telephone:
 Fax:


Relinquished By: *[Signature]* Date/Time: 8/21 1830
 Relinquished By: *[Signature]* Date/Time: 8/20 1445
 Relinquished By: Date/Time:

Quote #:
Mail To Contact: Travis Anderson
Mail To Company: GEI Consultants
Mail To Address: 109 W. Baraga Avenue, Marquette, MI 49855
Invoice To Contact: SAA
Invoice To Company: SAA
Invoice To Address: SAA
Invoice To Phone:

CLIENT COMMENTS
 I- Additional analytes added per TA. 8/26/20 CDH

LAB COMMENTS (Lab Use Only)
 1* - Sp, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl, Hg

Profile #
Receipt Temp = 1 °C
Sample Receipt pH
 Cooler Custody Seal Present / Not Present Intact / Not Intact


 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 26Mar2020
	Document No.: ENV-FRM-GBAY-0014-Rev.00	Author: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: COE Consultants
 Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Project #: _____

WO#: 40213414



40213414

Tracking #: 9325 1903 3964
 Custody Seal on Cooler/Box Present: yes no Seals intact: yes no
 Custody Seal on Samples Present: yes no Seals intact: yes no
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer Used SR - 86 Type of Ice: Wet Blue Dry None Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 0 /Corr: 1
 Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Person examining contents:

Date: 8/2/20 /Initials: AS

Labeled By Initials: SKU

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <u>8/2/20</u>	
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>W</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments
 Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logir

September 30, 2020

Travis Anderson
GEI Consultants, Inc
109 W. Baraga Avenue
Marquette, MI 49855

RE: Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Dear Travis Anderson:

Enclosed are the analytical results for sample(s) received by the laboratory on September 09, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Christopher Hyska
christopher.hyska@pacelabs.com
(920)469-2436
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40214274

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40214274001	MW-01	Water	09/08/20 10:45	09/09/20 11:00
40214274002	MW-02	Water	09/08/20 10:25	09/09/20 11:00
40214274003	MW-03	Water	09/08/20 10:00	09/09/20 11:00
40214274004	MW-04	Water	09/08/20 11:15	09/09/20 11:00
40214274005	MW-05	Water	09/08/20 11:35	09/09/20 11:00
40214274006	FIELD BLANK	Water	09/08/20 11:50	09/09/20 11:00

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SAMPLE ANALYTE COUNT

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40214274001	MW-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
40214274002	MW-02	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
40214274003	MW-03	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
40214274004	MW-04	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
40214274005	MW-05	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
40214274006	FIELD BLANK	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40214274001	MW-01					
EPA 903.1	Radium-226	0.168 ± 0.256 (0.412) C:NA T:96%	pCi/L		09/25/20 12:46	
EPA 904.0	Radium-228	0.399 ± 0.474 (1.01) C:74% T:84%	pCi/L		09/25/20 14:38	
Total Radium Calculation	Total Radium	0.567 ± 0.730 (1.42)	pCi/L		09/28/20 13:26	
40214274002	MW-02					
EPA 903.1	Radium-226	0.109 ± 0.339 (0.657) C:NA T:93%	pCi/L		09/25/20 12:46	
EPA 904.0	Radium-228	0.869 ± 0.485 (0.883) C:73% T:84%	pCi/L		09/25/20 14:36	
Total Radium Calculation	Total Radium	0.978 ± 0.824 (1.54)	pCi/L		09/28/20 13:12	
40214274003	MW-03					
EPA 903.1	Radium-226	0.513 ± 0.537 (0.841) C:NA T:85%	pCi/L		09/25/20 12:46	
EPA 904.0	Radium-228	0.404 ± 0.381 (0.783) C:75% T:93%	pCi/L		09/25/20 14:36	
Total Radium Calculation	Total Radium	0.917 ± 0.918 (1.62)	pCi/L		09/28/20 13:12	
40214274004	MW-04					
EPA 903.1	Radium-226	0.304 ± 0.572 (1.01) C:NA T:93%	pCi/L		09/25/20 12:46	
EPA 904.0	Radium-228	1.02 ± 0.494 (0.870) C:72% T:90%	pCi/L		09/25/20 14:38	
Total Radium Calculation	Total Radium	1.32 ± 1.07 (1.88)	pCi/L		09/28/20 13:26	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40214274005	MW-05					
EPA 903.1	Radium-226	0.308 ± 0.528 (0.925) C:NA T:85%	pCi/L		09/25/20 13:03	
EPA 904.0	Radium-228	0.957 ± 0.484 (0.869) C:72% T:93%	pCi/L		09/25/20 14:38	
Total Radium Calculation	Total Radium	1.27 ± 1.01 (1.79)	pCi/L		09/28/20 13:26	
40214274006	FIELD BLANK					
EPA 903.1	Radium-226	0.000 ± 0.331 (0.717) C:NA T:89%	pCi/L		09/25/20 13:03	
EPA 904.0	Radium-228	0.671 ± 0.474 (0.931) C:75% T:83%	pCi/L		09/25/20 14:38	
Total Radium Calculation	Total Radium	0.671 ± 0.805 (1.65)	pCi/L		09/28/20 13:26	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Sample: MW-01		Lab ID: 40214274001	Collected: 09/08/20 10:45	Received: 09/09/20 11:00	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.168 ± 0.256 (0.412) C:NA T:96%	pCi/L	09/25/20 12:46	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.399 ± 0.474 (1.01) C:74% T:84%	pCi/L	09/25/20 14:38	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.567 ± 0.730 (1.42)	pCi/L	09/28/20 13:26	7440-14-4	

Sample: MW-02		Lab ID: 40214274002	Collected: 09/08/20 10:25	Received: 09/09/20 11:00	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.109 ± 0.339 (0.657) C:NA T:93%	pCi/L	09/25/20 12:46	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.869 ± 0.485 (0.883) C:73% T:84%	pCi/L	09/25/20 14:36	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.978 ± 0.824 (1.54)	pCi/L	09/28/20 13:12	7440-14-4	

Sample: MW-03		Lab ID: 40214274003	Collected: 09/08/20 10:00	Received: 09/09/20 11:00	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.513 ± 0.537 (0.841) C:NA T:85%	pCi/L	09/25/20 12:46	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.404 ± 0.381 (0.783) C:75% T:93%	pCi/L	09/25/20 14:36	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.917 ± 0.918 (1.62)	pCi/L	09/28/20 13:12	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Sample: MW-04 Lab ID: 40214274004 Collected: 09/08/20 11:15 Received: 09/09/20 11:00 Matrix: Water						
PWS: Site ID: Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.304 ± 0.572 (1.01) C:NA T:93%	pCi/L	09/25/20 12:46	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	1.02 ± 0.494 (0.870) C:72% T:90%	pCi/L	09/25/20 14:38	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	1.32 ± 1.07 (1.88)	pCi/L	09/28/20 13:26	7440-14-4	

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Sample: MW-05 Lab ID: 40214274005 Collected: 09/08/20 11:35 Received: 09/09/20 11:00 Matrix: Water						
PWS: Site ID: Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.308 ± 0.528 (0.925) C:NA T:85%	pCi/L	09/25/20 13:03	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.957 ± 0.484 (0.869) C:72% T:93%	pCi/L	09/25/20 14:38	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	1.27 ± 1.01 (1.79)	pCi/L	09/28/20 13:26	7440-14-4	

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Sample: FIELD BLANK Lab ID: 40214274006 Collected: 09/08/20 11:50 Received: 09/09/20 11:00 Matrix: Water						
PWS: Site ID: Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.000 ± 0.331 (0.717) C:NA T:89%	pCi/L	09/25/20 13:03	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.671 ± 0.474 (0.931) C:75% T:83%	pCi/L	09/25/20 14:38	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.671 ± 0.805 (1.65)	pCi/L	09/28/20 13:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40214274

QC Batch: 413697

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 40214274001, 40214274002, 40214274003, 40214274004, 40214274005, 40214274006

METHOD BLANK: 2001110

Matrix: Water

Associated Lab Samples: 40214274001, 40214274002, 40214274003, 40214274004, 40214274005, 40214274006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.914 ± 0.450 (0.768) C:74% T:77%	pCi/L	09/25/20 14:31	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40214274

QC Batch: 413698

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 40214274001, 40214274002, 40214274003, 40214274004, 40214274005, 40214274006

METHOD BLANK: 2001111

Matrix: Water

Associated Lab Samples: 40214274001, 40214274002, 40214274003, 40214274004, 40214274005, 40214274006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.221 ± 0.398 (0.702) C:NA T:91%	pCi/L	09/25/20 12:30	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 1903625 MBLP CCR IMPOUNDMENT

Pace Project No.: 40214274

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 1903625 MBLP CCR IMPOUNDMENT
Pace Project No.: 40214274

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40214274001	MW-01	EPA 903.1	413698		
40214274002	MW-02	EPA 903.1	413698		
40214274003	MW-03	EPA 903.1	413698		
40214274004	MW-04	EPA 903.1	413698		
40214274005	MW-05	EPA 903.1	413698		
40214274006	FIELD BLANK	EPA 903.1	413698		
40214274001	MW-01	EPA 904.0	413697		
40214274002	MW-02	EPA 904.0	413697		
40214274003	MW-03	EPA 904.0	413697		
40214274004	MW-04	EPA 904.0	413697		
40214274005	MW-05	EPA 904.0	413697		
40214274006	FIELD BLANK	EPA 904.0	413697		
40214274001	MW-01	Total Radium Calculation	415896		
40214274002	MW-02	Total Radium Calculation	415894		
40214274003	MW-03	Total Radium Calculation	415894		
40214274004	MW-04	Total Radium Calculation	415896		
40214274005	MW-05	Total Radium Calculation	415896		
40214274006	FIELD BLANK	Total Radium Calculation	415896		

REPORT OF LABORATORY ANALYSIS

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(Please Print Clearly)

Company Name: GEI Consultants

Branch/Location: Marquette, MI

Project Contact: Travis Anderson

Phone: (906) 290-0723

Project Number: 1903625

Project Name: MBLP CCR Impoundment GW

Project State: MI

Sampled By (Print): Travis Anderson

Sampled By (Sign): *Travis Anderson*

PO #: N/A

Regulatory Program:

Data Package Options (billable)

EPA Level III

EPA Level IV

On your sample (billable)

NOT needed on your sample

MS/MSD

A = Air

B = Biota

C = Charcoal

O = Oil

S = Soil

SI = Sludge

W = Water

DW = Drinking Water

GW = Ground Water

SW = Surface Water

MW = Waste Water

WP = Wipe

CLIENT FIELD ID

Matrix Codes

DATE	COLLECTION TIME	MATRIX	Analyses Requested
9/8	1045	GW	Radium 226 (EPA 903.1)
9/8	1025	GW	Radium 228 (EPA 904.0)
9/8	1000	GW	Radium 226+228 (calc)
9/8	1115	GW	
9/8	1135	GW	
9/8	1150	W	

CHAIN OF CUSTODY



Preservation Codes

A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH

H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

UPPER MIDWEST REGION

MN: 612-607-1700 WI: 920-469-2436

COC No. 4024274

Quote #:

Mail To Contact: Travis Anderson

Mail To Company: GEI Consultants

Mail To Address: 109 W. Baraga Avenue, Marquette, MI 49855

Invoice To Contact: SAA

Invoice To Company: SAA

Invoice To Address: SAA

Invoice To Phone:

CLIENT COMMENTS

LAB COMMENTS (Lab Use Only)

Profile #

Rush Turnaround Time Requested - Prelims (Rush TAT subject to approval/surcharge)

Date Needed:

Transmit Prelim Rush Results by (complete what you want):

Email #1:

Email #2:

Telephone:

Fax:

Relinquished By: *Travis Anderson* Date/Time: 9/8 @ 1200

Relinquished By: *UPS* Date/Time: 9/9/20 1100

Relinquished By: Date/Time:

Relinquished By: Date/Time:

Relinquished By: Date/Time:

Received By: Date/Time:

Received By: *Scam* Date/Time: 9/9/20 1100

Received By: *Wayne Pace* Date/Time:

Received By: Date/Time:

Received By: Date/Time:

PACE Project No. *W024274*

Receipt Temp = 19.0 °C

Sample Receipt pH *OK* Adjusted

Cooler Custody Seal *Present* Not Present


Intact Not Intact

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: GEI Consultants

WO#: 40214274



40214274

Courier: CS Logistics Fed Ex Speedee UPS Waltco
 Client Pace Other: _____

Tracking #: 1Z WD3 54Y 03 9250 8998

Custody Seal on Cooler/Box Present: yes no Seals intact: yes no

Custody Seal on Samples Present: yes no Seals intact: yes no

Packing Material: Bubble Wrap Bubble Bags None Other Cardboard box + tube 9/9/20 SRK

Thermometer Used SR - 78 Type of Ice: Wet Blue Dry None Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 19.0 / Corr: 19.0

Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
 Date: 7/9/20 / Initials: SRK
 Labeled By Initials: [Signature]

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>w</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: _____ If checked, see attached form for additional comments

Person Contacted: _____ Date/Time: _____
 Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logir

Appendix D

Statistical Results

- D1 First Semi-Annual Sampling 2020 Statistical Evaluation
- D2 Second Semi-Annual Sampling 2020 Statistical Evaluation

Appendix D1- First Semi-Annual Statistical Evaluation

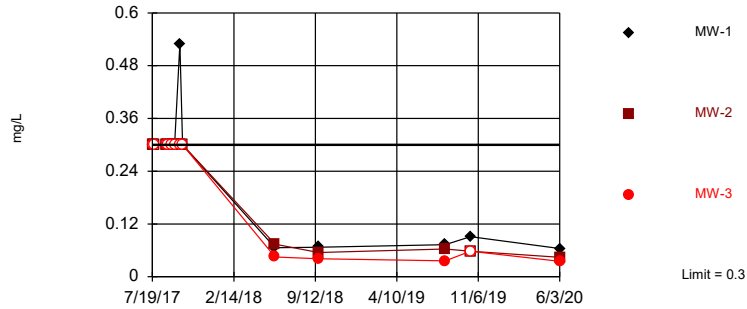
Interwell Upper Prediction Limit Summary

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:18 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-1	0.3	n/a	6/3/2020	0.064	No	26	65.38	n/a	0.002603	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-2	0.3	n/a	6/3/2020	0.044	No	26	65.38	n/a	0.002603	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-3	0.3	n/a	6/3/2020	0.035	No	26	65.38	n/a	0.002603	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-1	149.7	n/a	6/3/2020	83.9	No	26	0	No	0.002505	Param Inter 1 of 2
Calcium (mg/L)	MW-2	149.7	n/a	6/3/2020	56.5	No	26	0	No	0.002505	Param Inter 1 of 2
Calcium (mg/L)	MW-3	149.7	n/a	6/3/2020	70.5	No	26	0	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-1	466	n/a	6/3/2020	241	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-2	466	n/a	6/3/2020	65.2	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-3	466	n/a	6/3/2020	104	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-1	0.3	n/a	6/3/2020	0.095ND	No	26	69.23	n/a	0.002603	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-2	0.3	n/a	6/3/2020	0.48ND	No	26	69.23	n/a	0.002603	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-3	0.3	n/a	6/3/2020	0.095ND	No	26	69.23	n/a	0.002603	NP Inter (NDs) 1 of 2
pH [field] (SU)	MW-1	8.029	7.111	6/3/2020	7.92	No	26	0	No	0.001253	Param Inter 1 of 2
pH [field] (SU)	MW-2	8.029	7.111	6/3/2020	8	No	26	0	No	0.001253	Param Inter 1 of 2
pH [field] (SU)	MW-3	8.029	7.111	6/3/2020	7.98	No	26	0	No	0.001253	Param Inter 1 of 2
Sulfate (mg/L)	MW-1	53	n/a	6/3/2020	23.9	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-2	53	n/a	6/3/2020	23.1	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-3	53	n/a	6/3/2020	20.6	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-1	2300	n/a	6/3/2020	518	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-2	2300	n/a	6/3/2020	290	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-3	2300	n/a	6/3/2020	396	No	26	0	n/a	0.002603	NP Inter (normality) 1 of 2

Within Limit

Prediction Limit
Interwell Non-parametric

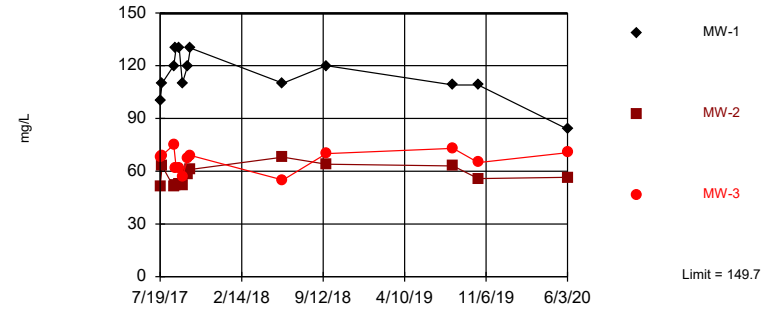


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 26 background values. 65.38% NDs. Annual per-constituent alpha = 0.01552. Individual comparison alpha = 0.002603 (1 of 2). Comparing 3 points to limit.

Constituent: Boron Analysis Run 11/4/2020 8:17 AM
Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
Interwell Parametric

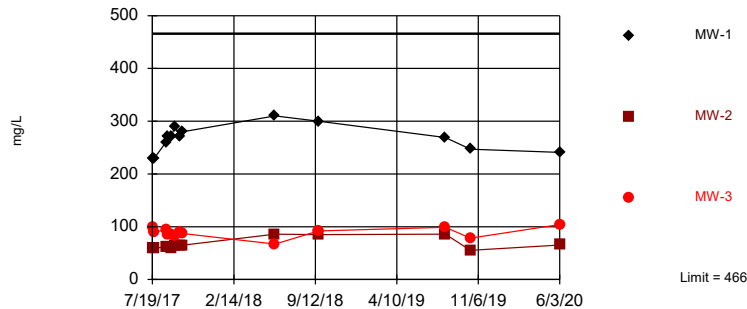


Background Data Summary: Mean=116.2, Std. Dev.=18.32, n=26. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9148, critical = 0.891. Kappa = 1.826 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Calcium Analysis Run 11/4/2020 8:17 AM
Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
Interwell Non-parametric

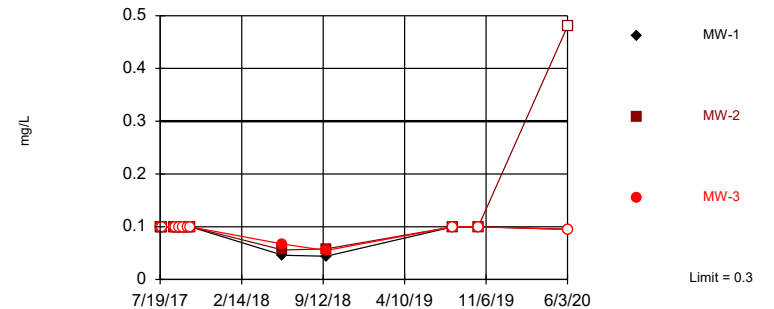


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 26 background values. Annual per-constituent alpha = 0.01552. Individual comparison alpha = 0.002603 (1 of 2). Comparing 3 points to limit.

Constituent: Chloride Analysis Run 11/4/2020 8:17 AM
Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
Interwell Non-parametric

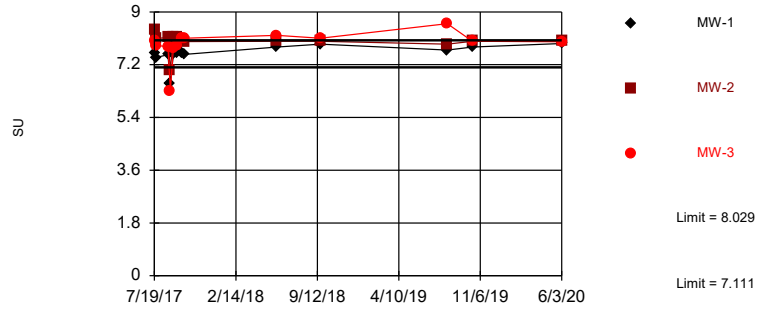


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 26 background values. 69.23% NDs. Annual per-constituent alpha = 0.01552. Individual comparison alpha = 0.002603 (1 of 2). Comparing 3 points to limit.

Constituent: Fluoride Analysis Run 11/4/2020 8:17 AM
Client: GEI Data: Shiras Database

Within Limits

Prediction Limit
Interwell Parametric

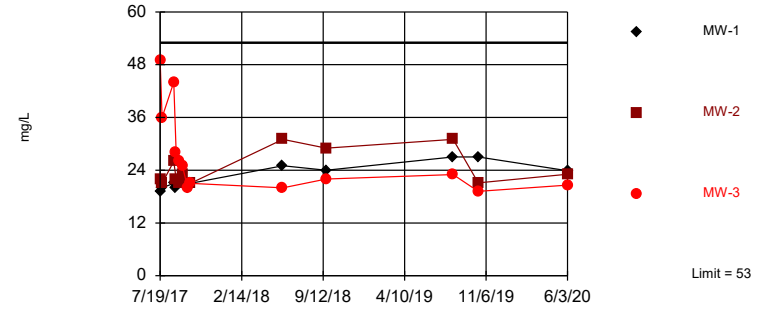


Background Data Summary: Mean=7.57, Std. Dev.=0.2516, n=26. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9136, critical = 0.891. Kappa = 1.826 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001253. Comparing 3 points to limit.

Constituent: pH [field] Analysis Run 11/4/2020 8:17 AM
Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
Interwell Non-parametric

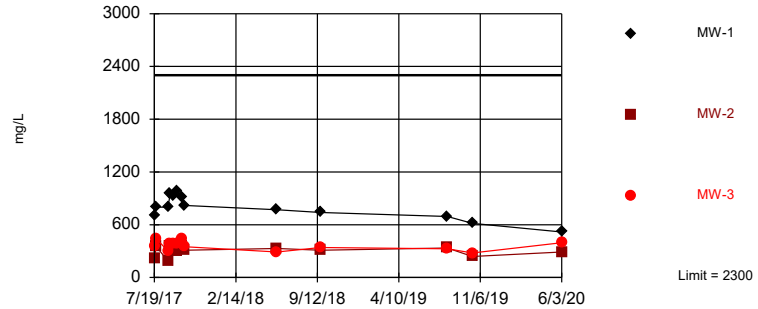


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 26 background values. Annual per-constituent alpha = 0.01552. Individual comparison alpha = 0.002603 (1 of 2). Comparing 3 points to limit.

Constituent: Sulfate Analysis Run 11/4/2020 8:17 AM
Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 26 background values. Annual per-constituent alpha = 0.01552. Individual comparison alpha = 0.002603 (1 of 2). Comparing 3 points to limit.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:17 AM
Client: GEI Data: Shiras Database

Trend Test - Significant Results

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:26 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-2	-0.0892	-46	-39	Yes	13	69.23	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3	-0.09234	-44	-39	Yes	13	69.23	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4 (bg)	-0.07108	-47	-39	Yes	13	61.54	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5 (bg)	-0.09129	-42	-39	Yes	13	69.23	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5 (bg)	16.37	46	39	Yes	13	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4 (bg)	104.8	60	39	Yes	13	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5 (bg)	30.67	40	39	Yes	13	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-1	0.1478	48	39	Yes	13	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-4 (bg)	-0.07522	-40	-39	Yes	13	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-1	3.132	51	39	Yes	13	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3	-9.144	-53	-39	Yes	13	0	n/a	n/a	0.02	NP

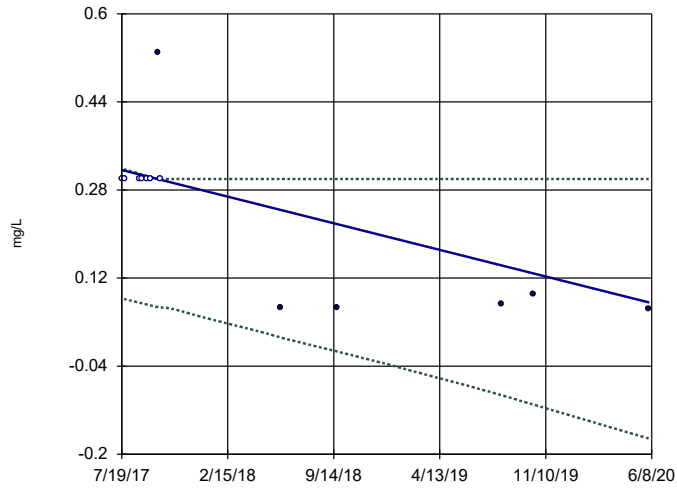
Trend Test - All Results

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:22 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-1	-0.08365	-33	-39	No	13	53.85	n/a	n/a	0.02	NP
Boron (mg/L)	MW-2	-0.0892	-46	-39	Yes	13	69.23	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3	-0.09234	-44	-39	Yes	13	69.23	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4 (bg)	-0.07108	-47	-39	Yes	13	61.54	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5 (bg)	-0.09129	-42	-39	Yes	13	69.23	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-1	-0.6236	-18	-39	No	13	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2	2.898	31	39	No	13	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3	0.7131	8	39	No	13	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4 (bg)	12.28	39	39	No	13	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5 (bg)	16.37	46	39	Yes	13	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-1	14.35	16	39	No	13	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2	12.96	37	39	No	13	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3	-2.517	-3	-39	No	13	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4 (bg)	104.8	60	39	Yes	13	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5 (bg)	30.67	40	39	Yes	13	0	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-1	0	-21	-39	No	13	84.62	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2	0	1	39	No	13	84.62	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3	0	-21	-39	No	13	84.62	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4 (bg)	0.01445	16	39	No	13	53.85	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5 (bg)	0	-21	-39	No	13	84.62	n/a	n/a	0.02	NP
pH [field] (SU)	MW-1	0.1478	48	39	Yes	13	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-2	-0.0804	-33	-39	No	13	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-3	0.2191	28	39	No	13	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-4 (bg)	-0.07522	-40	-39	Yes	13	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-5 (bg)	0.1416	39	39	No	13	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-1	3.132	51	39	Yes	13	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2	0.2158	18	39	No	13	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3	-9.144	-53	-39	Yes	13	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4 (bg)	-1.288	-7	-39	No	13	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5 (bg)	0.03493	9	39	No	13	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-1	-98.13	-35	-39	No	13	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-2	0	-4	-39	No	13	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-3	-22.49	-22	-39	No	13	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-4 (bg)	82.04	32	39	No	13	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5 (bg)	42.61	18	39	No	13	0	n/a	n/a	0.02	NP

Sen's Slope and 95% Confidence Band

MW-1

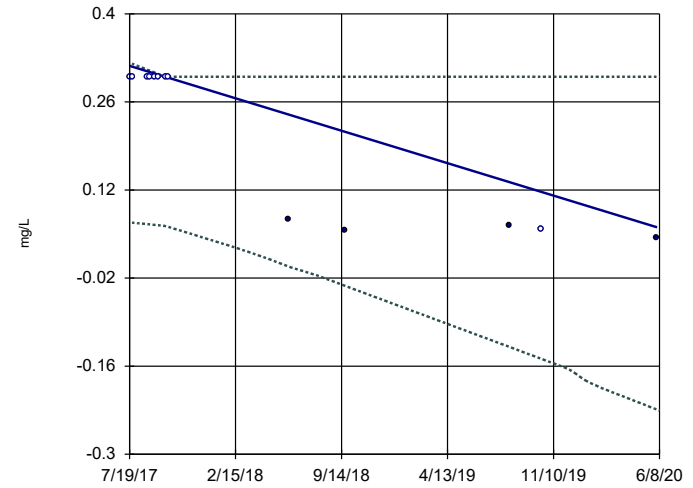


n = 13
Slope = -0.08365
units per year.
Mann-Kendall
statistic = -33
critical = -39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Boron Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

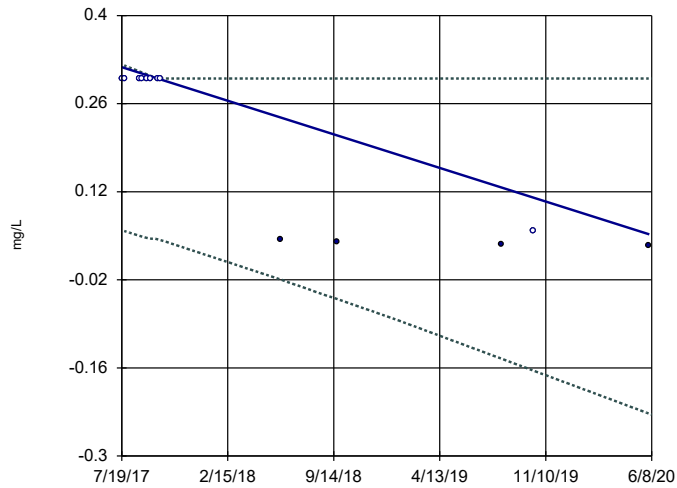


n = 13
Slope = -0.0892
units per year.
Mann-Kendall
statistic = -46
critical = -39
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Boron Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

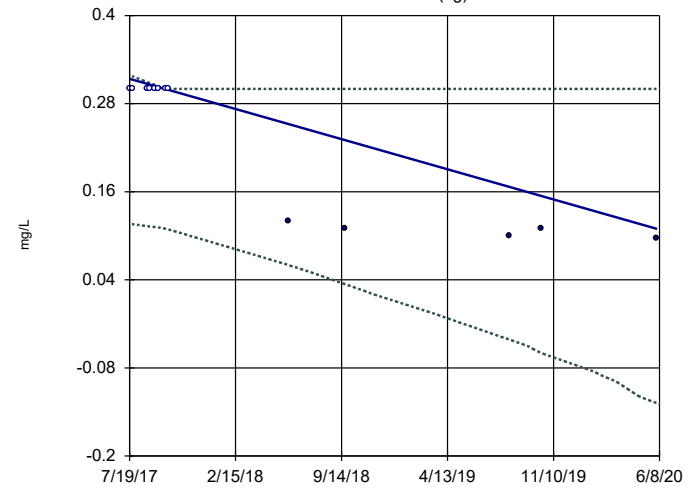


n = 13
Slope = -0.09234
units per year.
Mann-Kendall
statistic = -44
critical = -39
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Boron Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

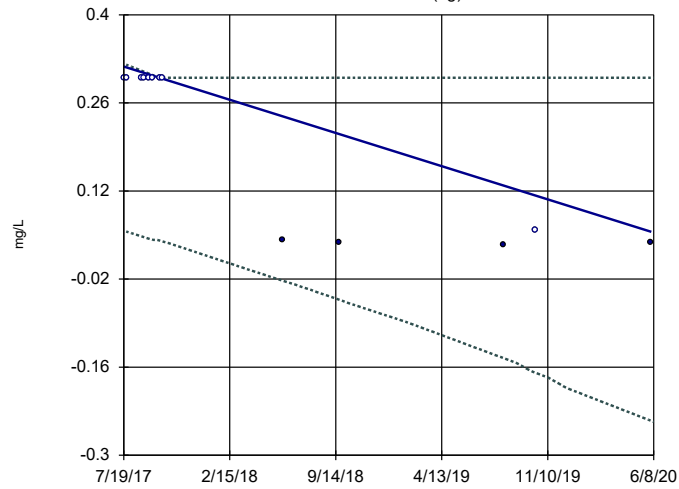


n = 13
Slope = -0.07108
units per year.
Mann-Kendall
statistic = -47
critical = -39
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Boron Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

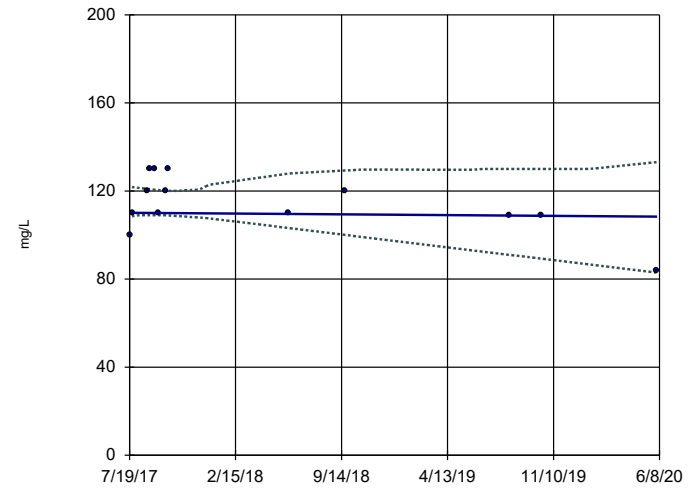


n = 13
Slope = -0.09129
units per year.
Mann-Kendall
statistic = -42
critical = -39
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Boron Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

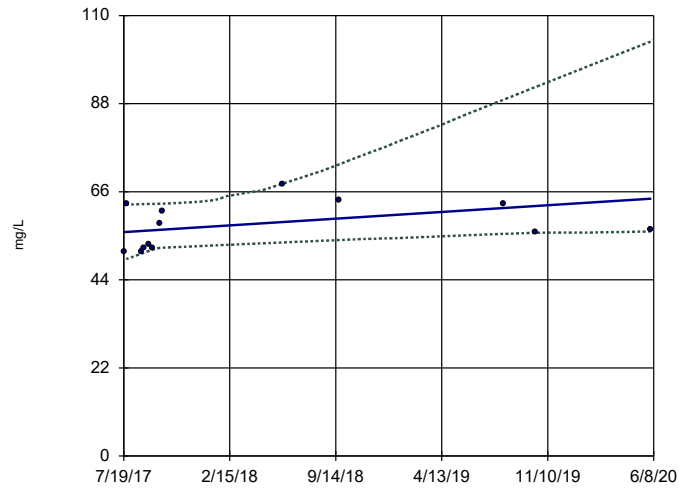


n = 13
Slope = -0.6236
units per year.
Mann-Kendall
statistic = -18
critical = -39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Calcium Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

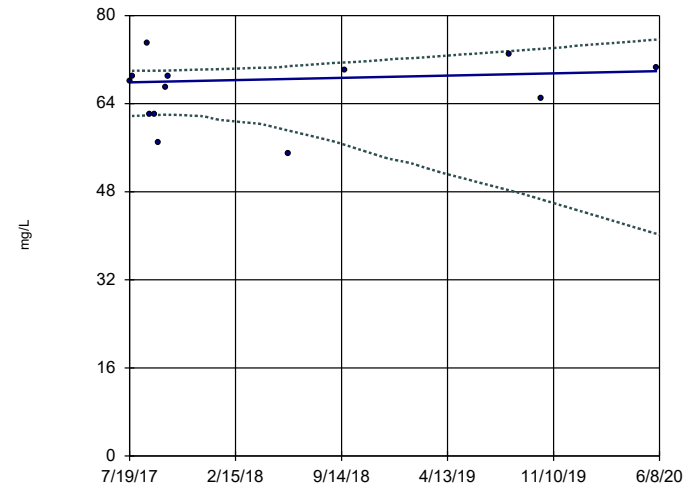


n = 13
Slope = 2.898
units per year.
Mann-Kendall
statistic = 31
critical = 39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Calcium Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

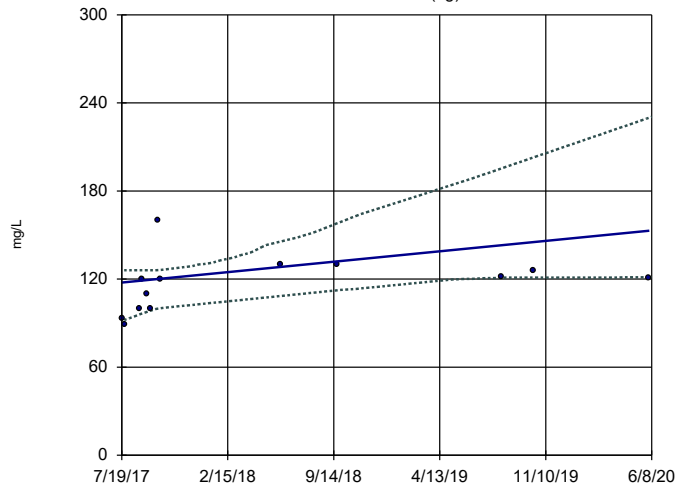


n = 13
Slope = 0.7131
units per year.
Mann-Kendall
statistic = 8
critical = 39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Calcium Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

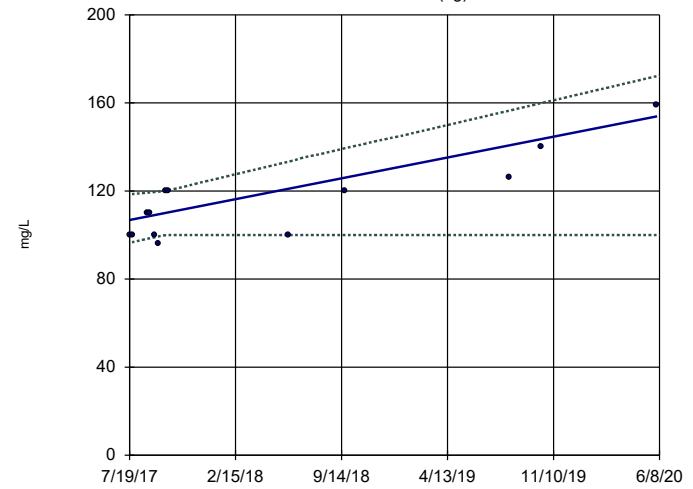


n = 13
 Slope = 12.28
 units per year.
 Mann-Kendall
 statistic = 39
 critical = 39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Calcium Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

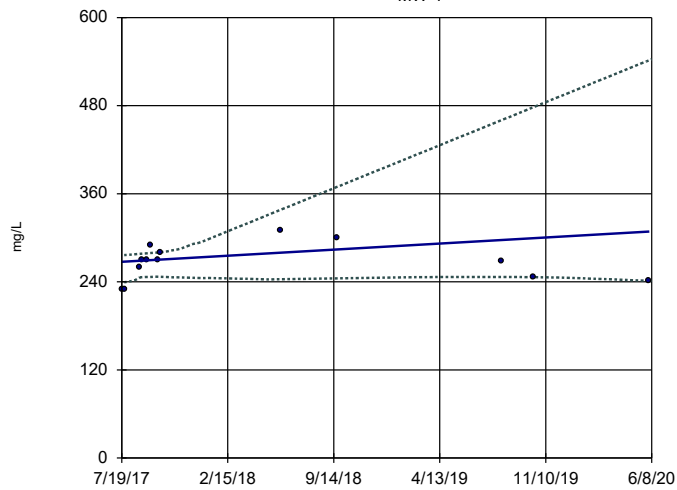


n = 13
 Slope = 16.37
 units per year.
 Mann-Kendall
 statistic = 46
 critical = 39
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Calcium Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

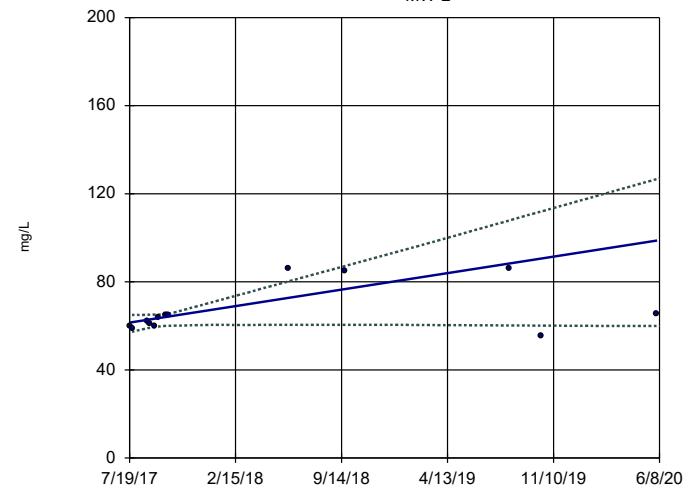


n = 13
 Slope = 14.35
 units per year.
 Mann-Kendall
 statistic = 16
 critical = 39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

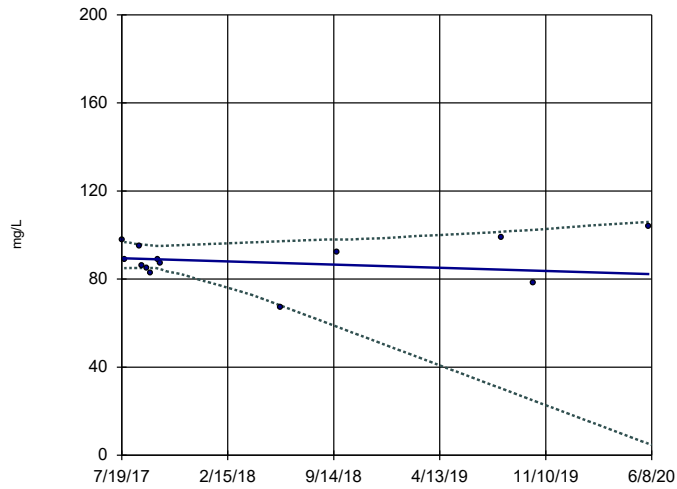


n = 13
 Slope = 12.96
 units per year.
 Mann-Kendall
 statistic = 37
 critical = 39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

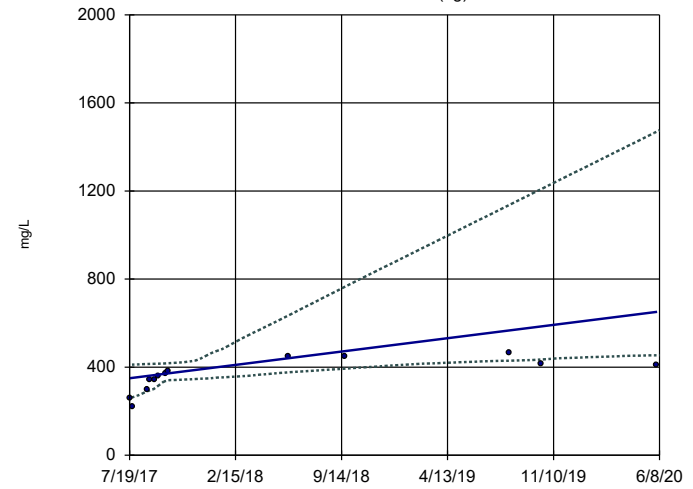


n = 13
 Slope = -2.517
 units per year.
 Mann-Kendall
 statistic = -3
 critical = -39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

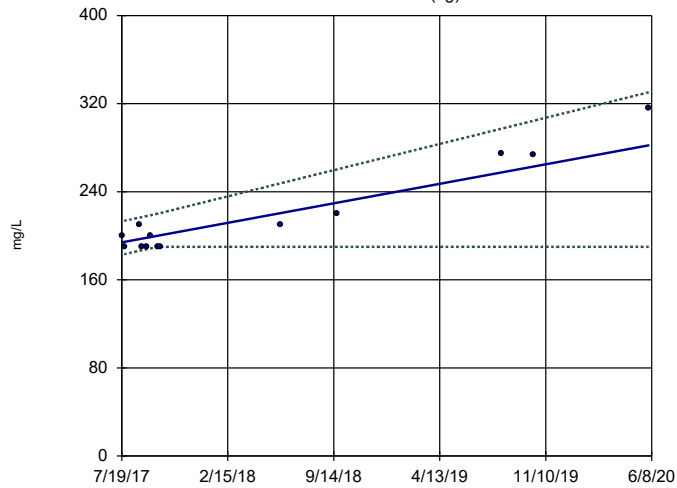


n = 13
 Slope = 104.8
 units per year.
 Mann-Kendall
 statistic = 60
 critical = 39
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

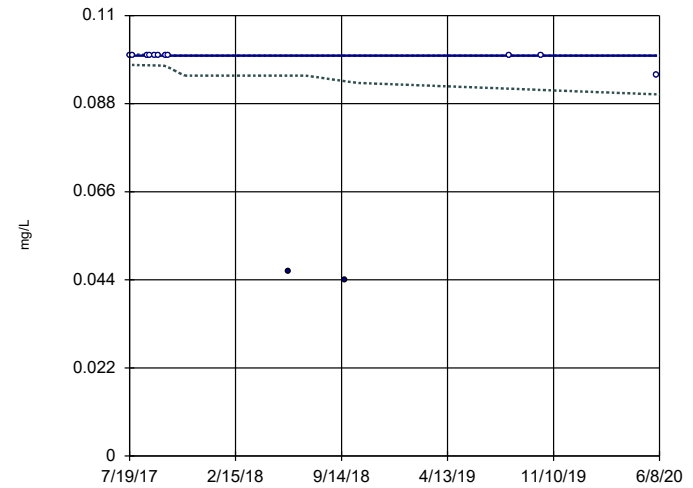


n = 13
 Slope = 30.67
 units per year.
 Mann-Kendall
 statistic = 40
 critical = 39
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

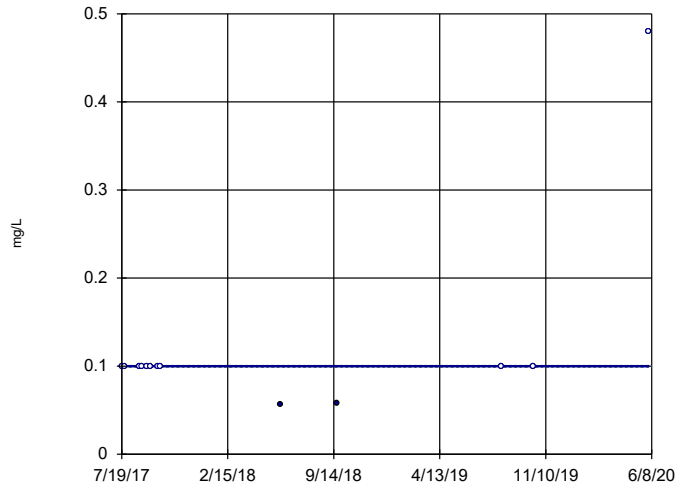


n = 13
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -21
 critical = -39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

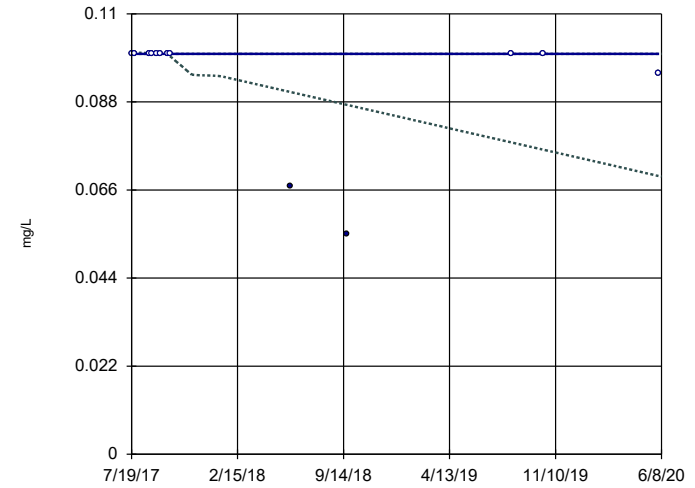


n = 13
Slope = 0
units per year.
Mann-Kendall
statistic = 1
critical = 39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

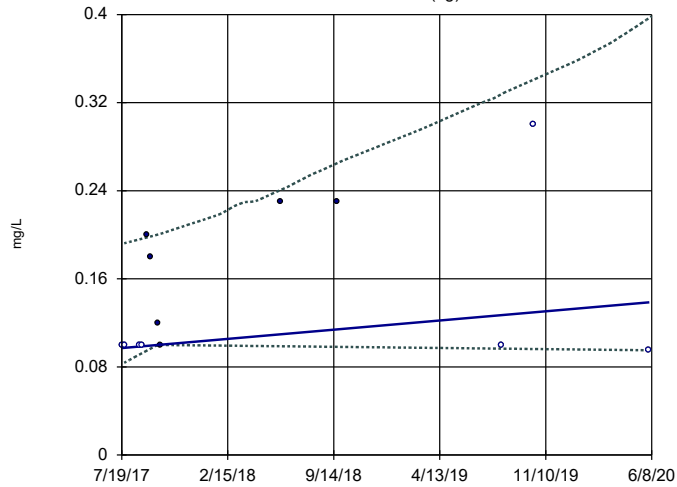


n = 13
Slope = 0
units per year.
Mann-Kendall
statistic = -21
critical = -39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

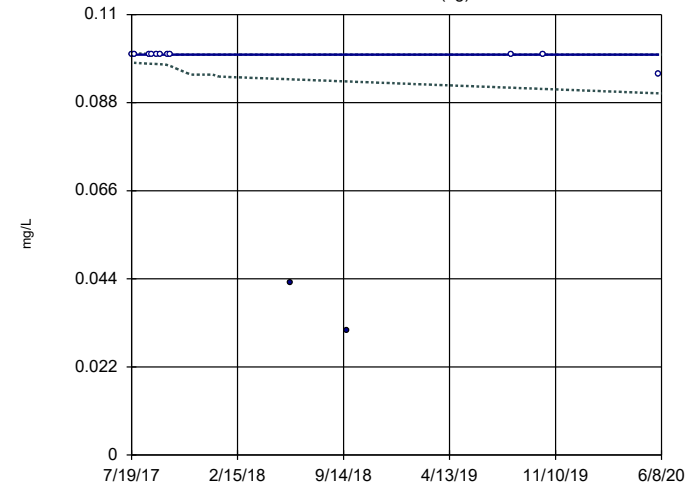


n = 13
Slope = 0.01445
units per year.
Mann-Kendall
statistic = 16
critical = 39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

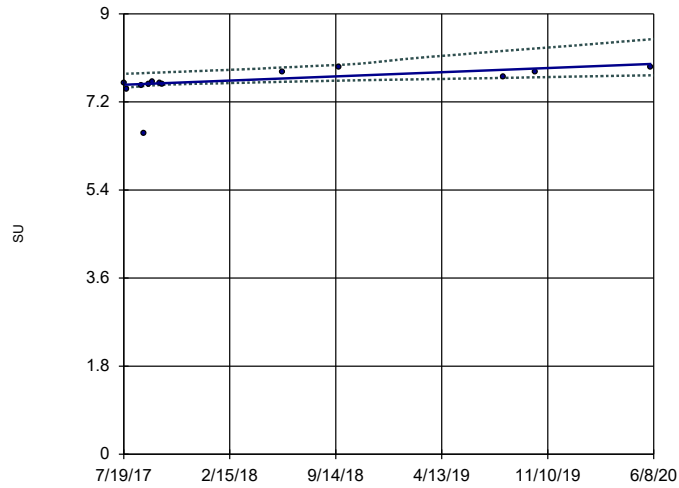


n = 13
Slope = 0
units per year.
Mann-Kendall
statistic = -21
critical = -39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

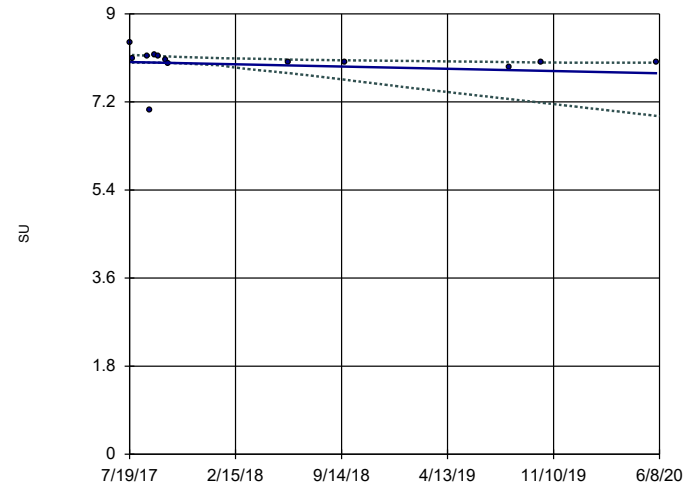


n = 13
 Slope = 0.1478
 units per year.
 Mann-Kendall
 statistic = 48
 critical = 39
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

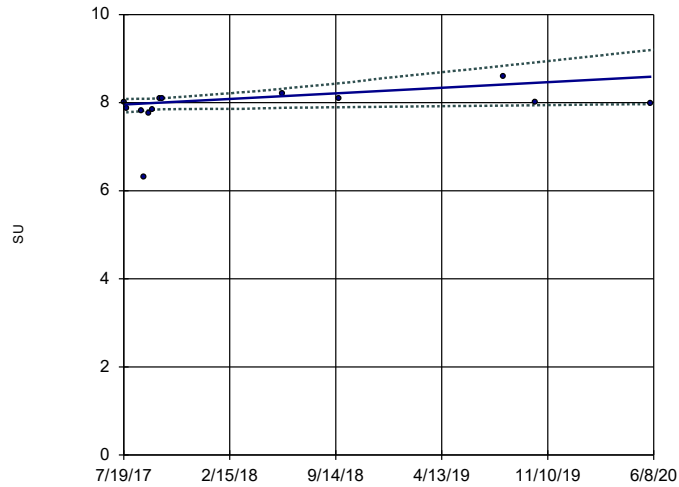


n = 13
 Slope = -0.0804
 units per year.
 Mann-Kendall
 statistic = -33
 critical = -39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

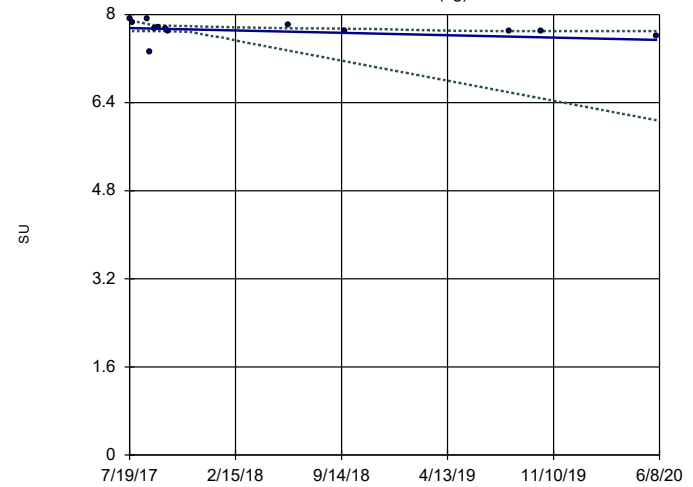


n = 13
 Slope = 0.2191
 units per year.
 Mann-Kendall
 statistic = 28
 critical = 39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

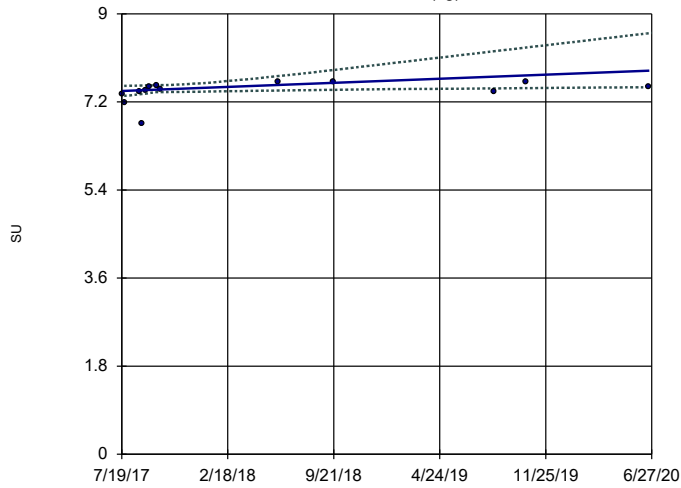


n = 13
 Slope = -0.07522
 units per year.
 Mann-Kendall
 statistic = -40
 critical = -39
 Decreasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

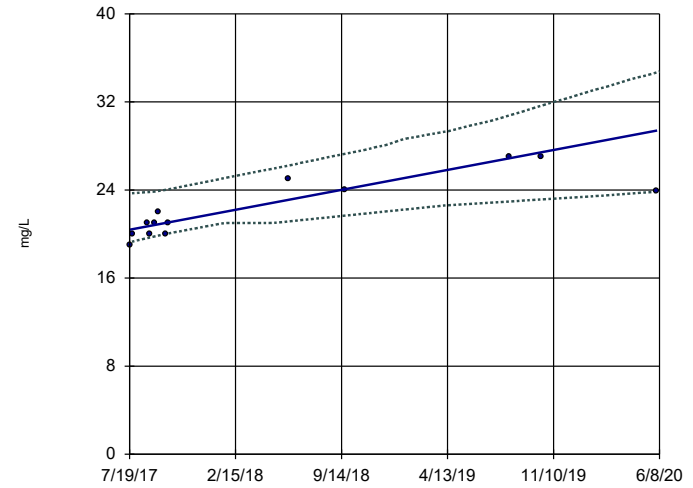


n = 13
 Slope = 0.1416
 units per year.
 Mann-Kendall
 statistic = 39
 critical = 39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

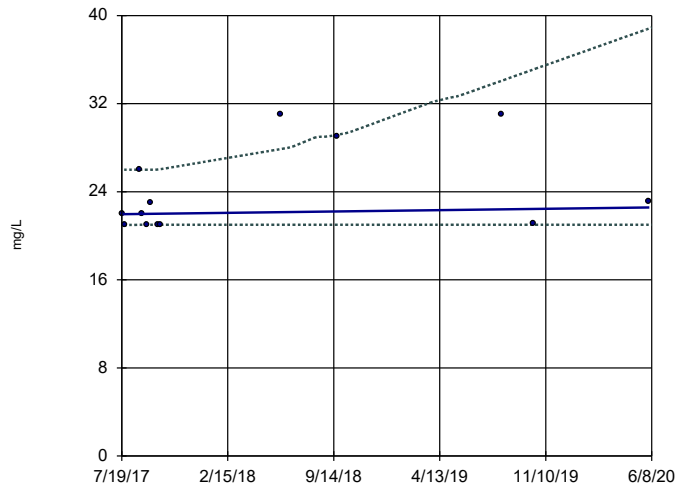


n = 13
 Slope = 3.132
 units per year.
 Mann-Kendall
 statistic = 51
 critical = 39
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

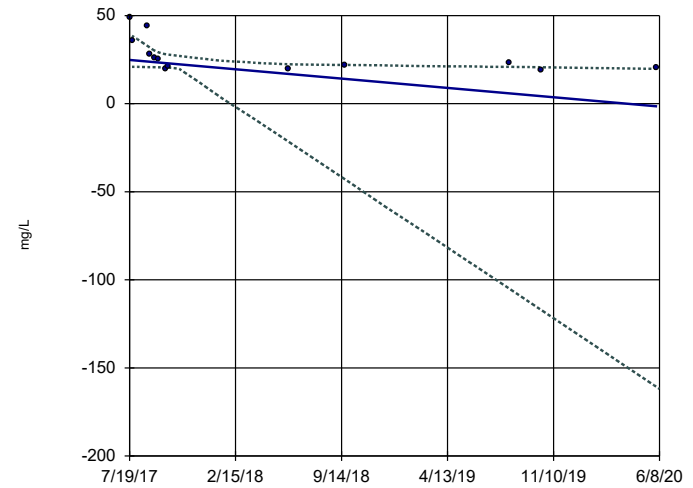


n = 13
 Slope = 0.2158
 units per year.
 Mann-Kendall
 statistic = 18
 critical = 39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

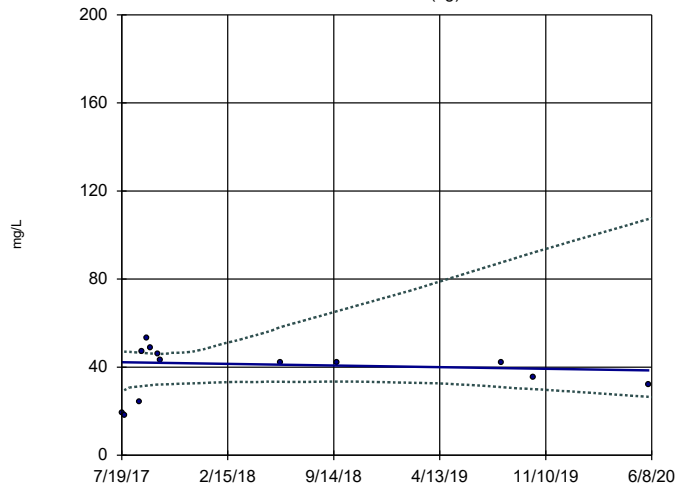


n = 13
 Slope = -9.144
 units per year.
 Mann-Kendall
 statistic = -53
 critical = -39
 Decreasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

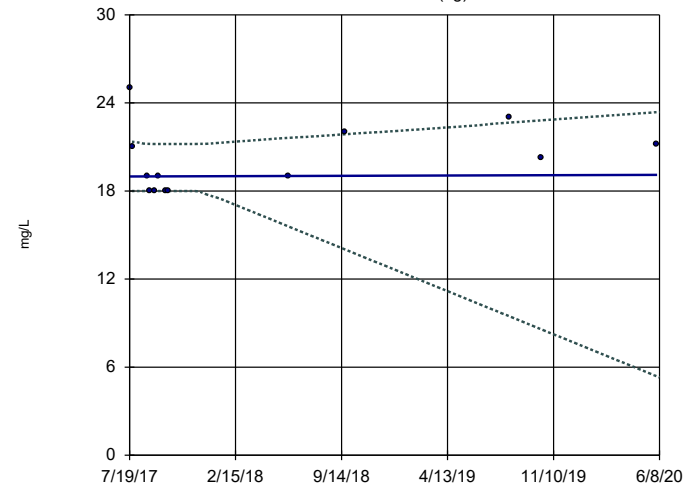


n = 13
 Slope = -1.288
 units per year.
 Mann-Kendall
 statistic = -7
 critical = -39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

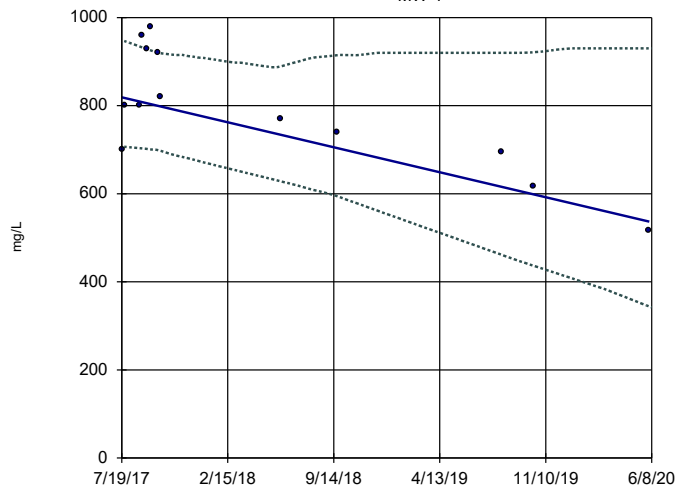


n = 13
 Slope = 0.03493
 units per year.
 Mann-Kendall
 statistic = 9
 critical = 39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

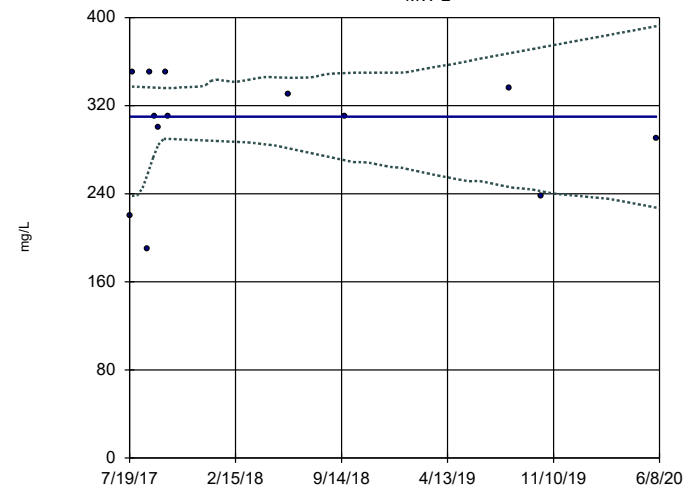


n = 13
 Slope = -98.13
 units per year.
 Mann-Kendall
 statistic = -35
 critical = -39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

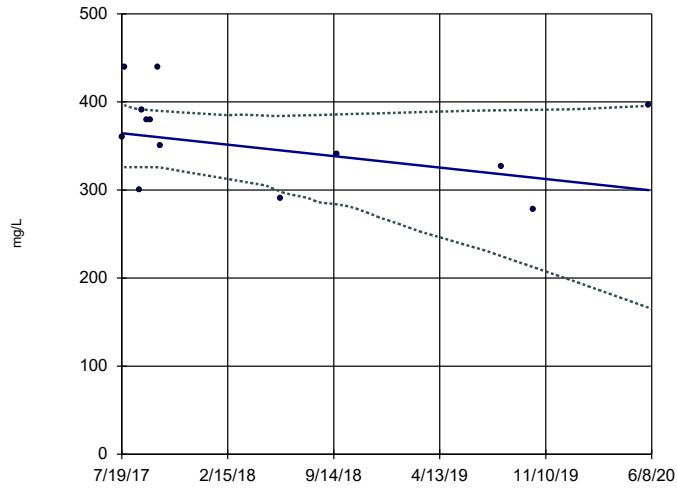


n = 13
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -4
 critical = -39
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:19 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

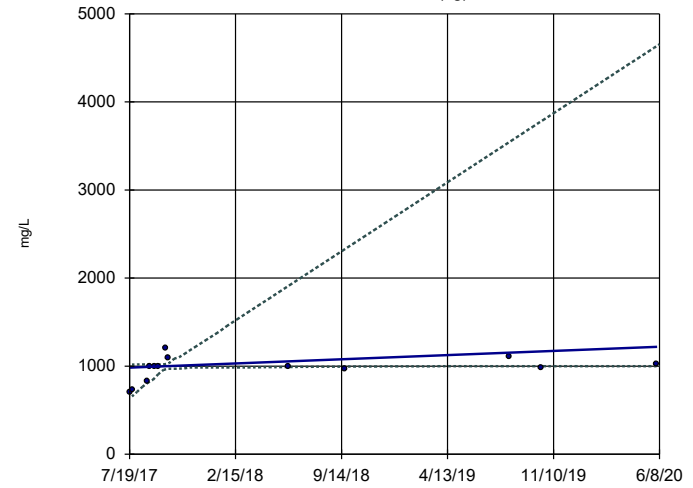


n = 13
Slope = -22.49
units per year.
Mann-Kendall
statistic = -22
critical = -39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

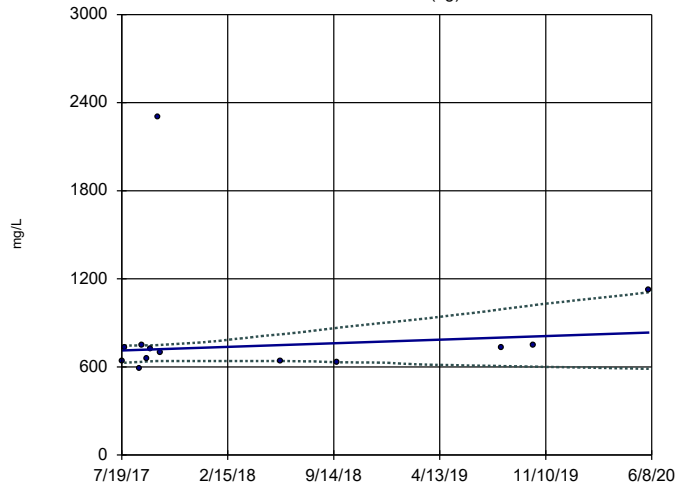


n = 13
Slope = 82.04
units per year.
Mann-Kendall
statistic = 32
critical = 39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)



n = 13
Slope = 42.61
units per year.
Mann-Kendall
statistic = 18
critical = 39
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:19 AM
Client: GEI Data: Shiras Database

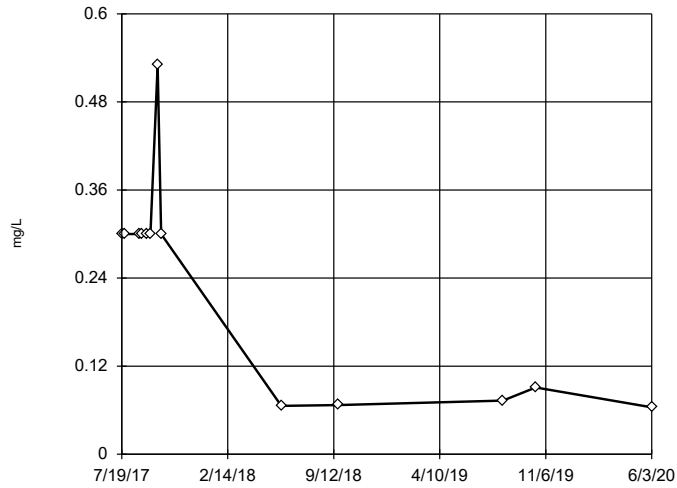
Outlier Analysis

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:11 AM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distrib...</u>	<u>Normality Test</u>
Boron (mg/L)	MW-1	No	n/a	n/a	NP (nrm)	13	0.2301	0.1441	unknown	ShapiroWilk
Boron (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	13	0.2072	0.1223	unknown	ShapiroWilk
Boron (mg/L)	MW-3	No	n/a	n/a	NP (nrm)	13	0.2012	0.1302	unknown	ShapiroWilk
Boron (mg/L)	MW-4 (bg)	No	n/a	n/a	NP (nrm)	13	0.2258	0.09778	unknown	ShapiroWilk
Boron (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	13	0.2008	0.1307	unknown	ShapiroWilk
Calcium (mg/L)	MW-1	Yes	83.9	6/3/2020	Dixon's	13	114	13.15	normal	ShapiroWilk
Calcium (mg/L)	MW-2	No	n/a	n/a	EPA 1989	13	57.56	5.734	normal	ShapiroWilk
Calcium (mg/L)	MW-3	No	n/a	n/a	EPA 1989	13	66.34	5.937	normal	ShapiroWilk
Calcium (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA 1989	13	117	18.96	normal	ShapiroWilk
Calcium (mg/L)	MW-5 (bg)	No	n/a	n/a	EPA 1989	13	115.5	18.41	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-1	No	n/a	n/a	EPA 1989	13	266.7	25.05	normal	ShapiroWilk
Chloride (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	13	67.18	10.91	unknown	ShapiroWilk
Chloride (mg/L)	MW-3	No	n/a	n/a	Dixon's	13	88.64	9.63	normal	ShapiroWilk
Chloride (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA 1989	13	366.4	74.81	normal	ShapiroWilk
Chloride (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	13	219.6	41.49	unknown	ShapiroWilk
Fluoride (mg/L)	MW-1	Yes	0.046,0.044	5/31/2018,9/20/2018	NP (nrm)	13	0.09115	0.02053	unknown	ShapiroWilk
Fluoride (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	13	0.1226	0.1086	unknown	ShapiroWilk
Fluoride (mg/L)	MW-3	Yes	0.067,0.055	5/31/2018,9/20/2018	NP (nrm)	13	0.09362	0.01475	unknown	ShapiroWilk
Fluoride (mg/L)	MW-4 (bg)	No	n/a	n/a	NP (nrm)	13	0.1504	0.0693	unknown	ShapiroWilk
Fluoride (mg/L)	MW-5 (bg)	Yes	0.043,0.031	5/31/2018,9/20/2018	NP (nrm)	13	0.08992	0.02366	unknown	ShapiroWilk
pH [field] (SU)	MW-1	Yes	6.56	8/29/2017	Dixon's	13	7.58	0.3403	normal	ShapiroWilk
pH [field] (SU)	MW-2	Yes	8.41,7.03	7/19/2017,8/29/2017	Dixon's	13	7.992	0.3146	normal	ShapiroWilk
pH [field] (SU)	MW-3	Yes	8.6,6.32	8/13/2019,8/29/2017	Dixon's	13	7.898	0.5203	normal	ShapiroWilk
pH [field] (SU)	MW-4 (bg)	Yes	7.32	8/29/2017	Dixon's	13	7.73	0.1551	normal	ShapiroWilk
pH [field] (SU)	MW-5 (bg)	Yes	7.17,6.76	7/24/2017,8/29/2017	Dixon's	13	7.41	0.2288	normal	ShapiroWilk
Sulfate (mg/L)	MW-1	No	n/a	n/a	EPA 1989	13	22.38	2.72	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	13	24.02	3.886	unknown	ShapiroWilk
Sulfate (mg/L)	MW-3	No	n/a	n/a	NP (nrm)	13	27.22	9.731	unknown	ShapiroWilk
Sulfate (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA 1989	13	37.88	11.41	normal	ShapiroWilk
Sulfate (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	13	20.12	2.224	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1	No	n/a	n/a	EPA 1989	13	788.3	137.5	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	13	298.8	51.98	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-3	No	n/a	n/a	EPA 1989	13	359.2	52.18	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA 1989	13	972.8	143.1	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-5 (bg)	Yes	1120,2300	6/3/2020,9/28/2017	Dixon's	13	842.9	456.8	normal	ShapiroWilk

Tukey's Outlier Screening

MW-1

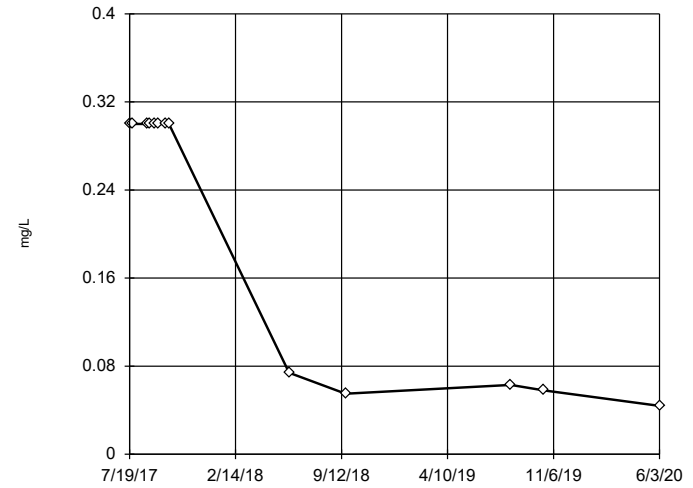


n = 13
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 0.99, low cutoff = -0.62, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

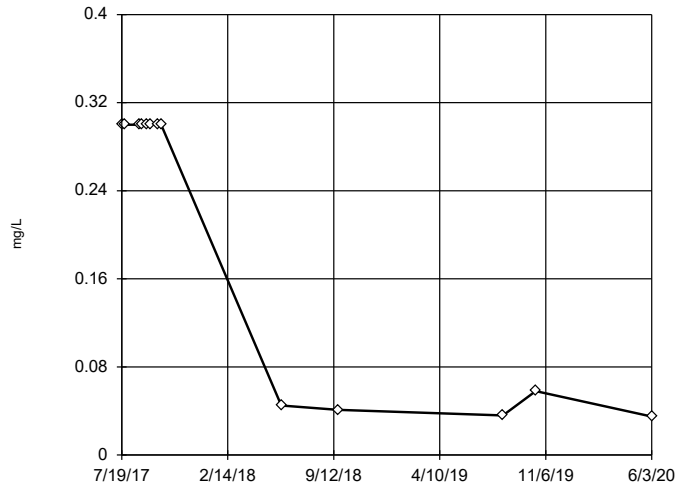


n = 13
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 36.67, low cutoff = 0.0004945, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-3

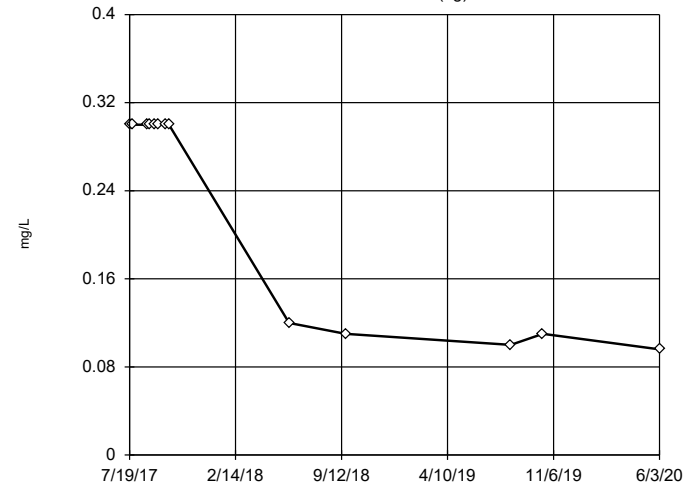


n = 13
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 102.2, low cutoff = 0.0001261, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

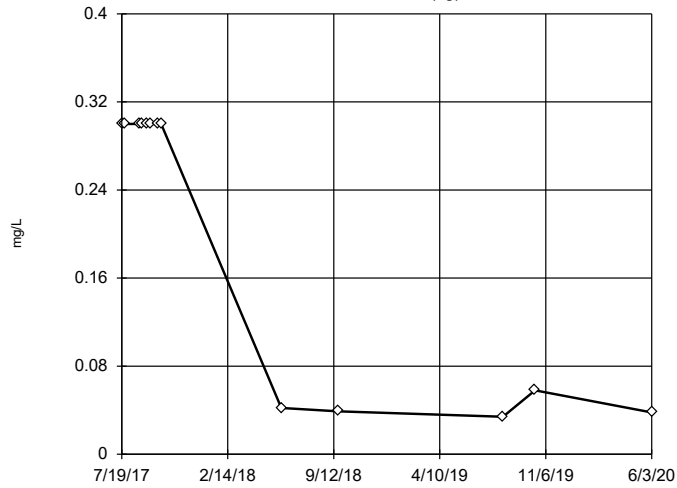
MW-4 (bg)



n = 13
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 6.086, low cutoff = 0.005423, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

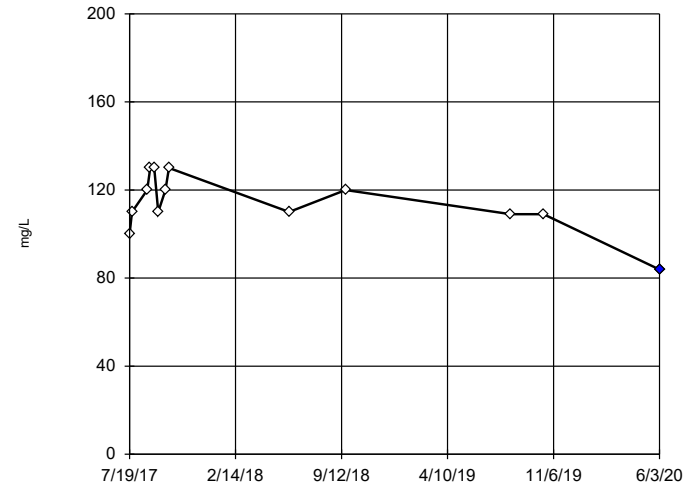
Tukey's Outlier Screening
MW-5 (bg)



n = 13
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 122.2, low cutoff = 0.00009937, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

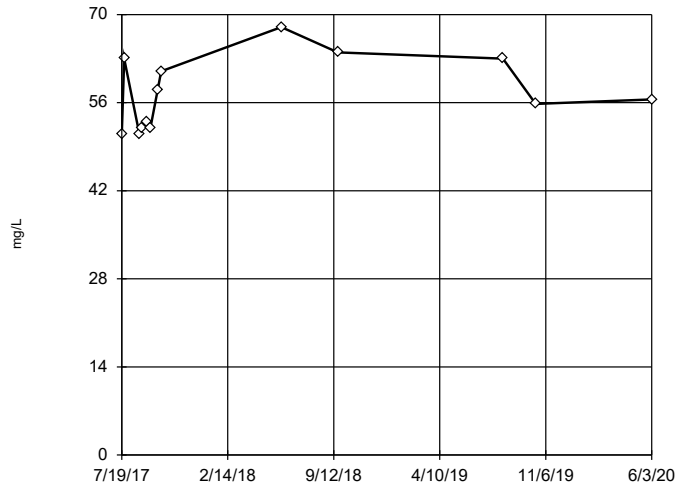
Dixon's Outlier Test
MW-1



n = 13
Statistical outlier is drawn as solid. Testing for 1 low outlier. Mean = 114. Std. Dev. = 13.15. 83.9: c = 0.5445 tab1 = 0.521. Alpha = 0.05.
Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.886 Critical = 0.883 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

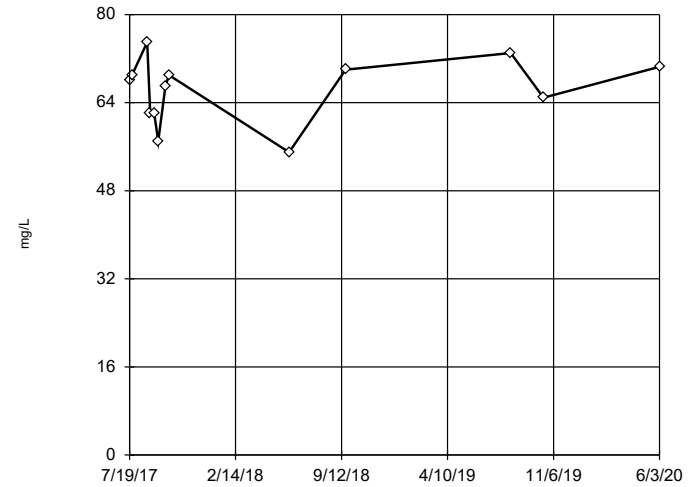
EPA Screening (suspected outliers for Dixon's Test)
MW-2



n = 13
Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 57.56, std. dev. 5.734, critical Tn 2.331
Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9112 Critical = 0.889 The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)
MW-3

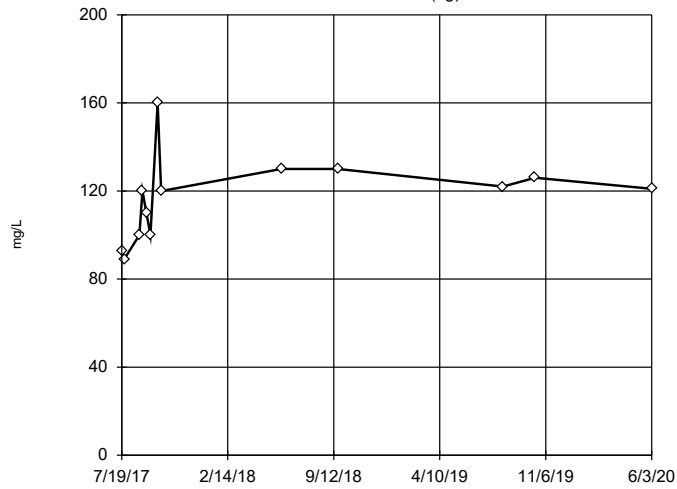


n = 13
Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 66.34, std. dev. 5.937, critical Tn 2.331
Normality test used: Shapiro Wilk@alpha = 0.1 Calculated = 0.9468 Critical = 0.889 The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)

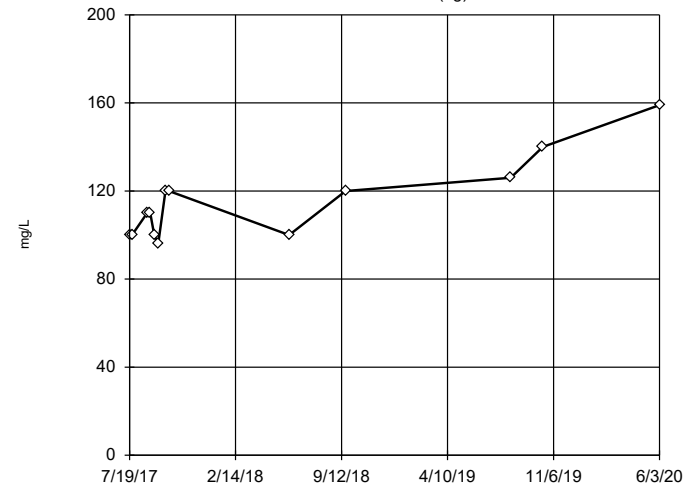


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 117, std. dev. 18.96, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9317
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-5 (bg)

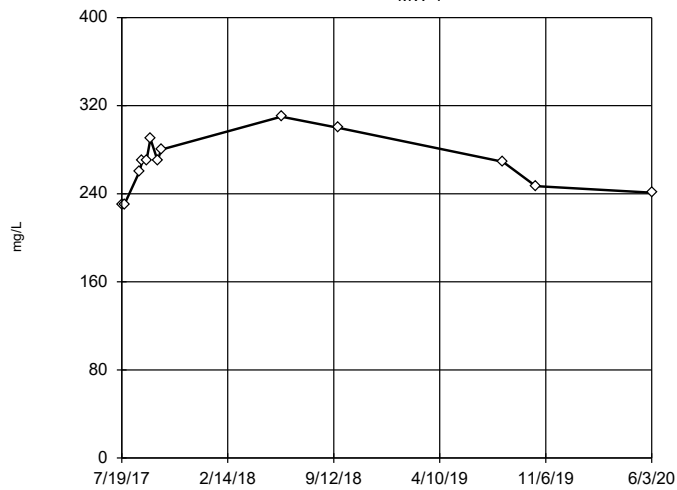


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 115.5, std. dev. 18.41, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.8983
 Critical = 0.889 (after natural log transformation)
 The distribution was found to be log-normal.

Constituent: Calcium Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-1

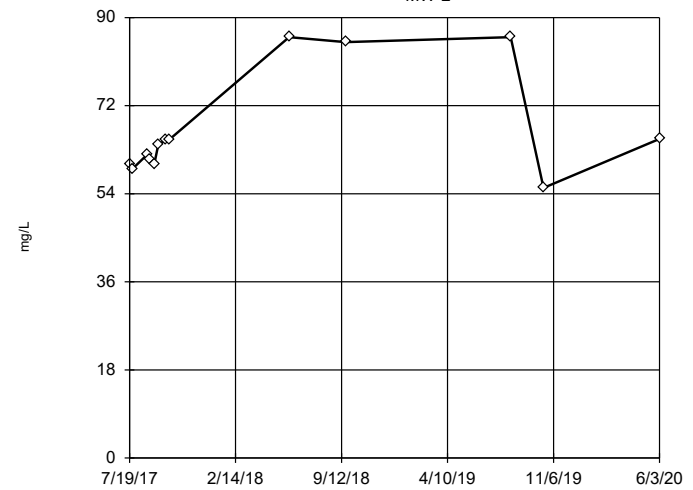


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 266.7, std. dev. 25.05, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9541
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Chloride Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

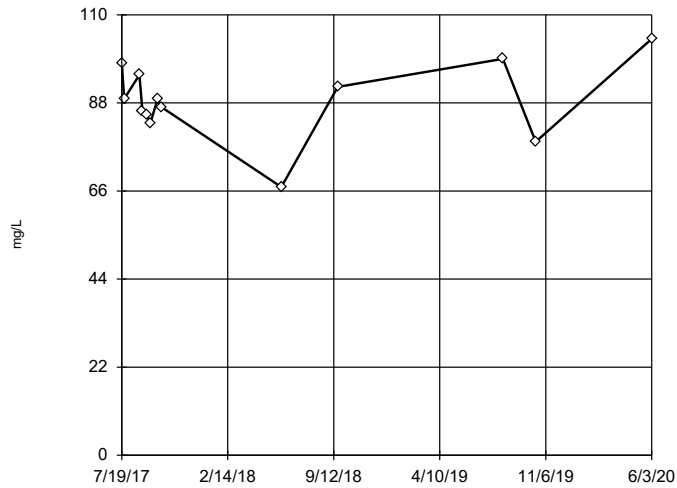


n = 13
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 142.2, low cutoff = 31.41, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test

MW-3

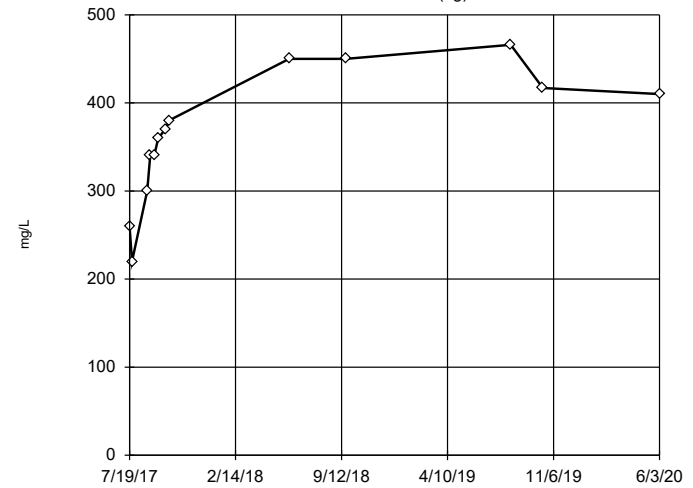


n = 13
 No statistical outliers.
 Testing for 1 low outlier.
 Mean = 88.64.
 Std. Dev = 9.63.
 67: c = 0.5
 tab1 = 0.521.
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9776
 Critical = 0.883
 The distribution was found to be normally distributed.

Constituent: Chloride Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)

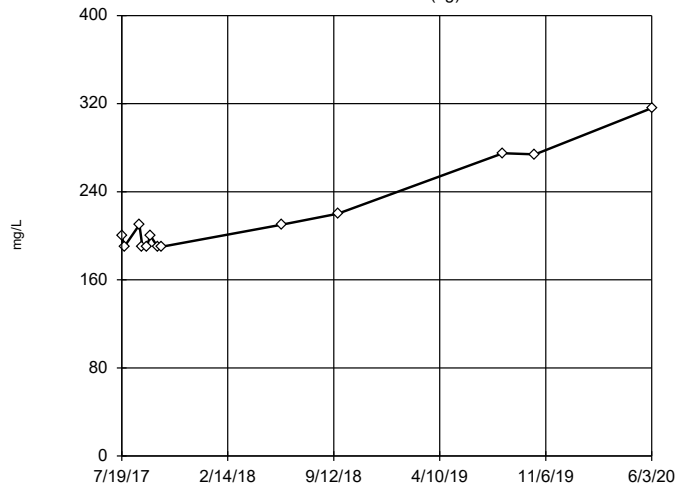


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 365.4, std. dev. 74.81, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9539
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Chloride Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)

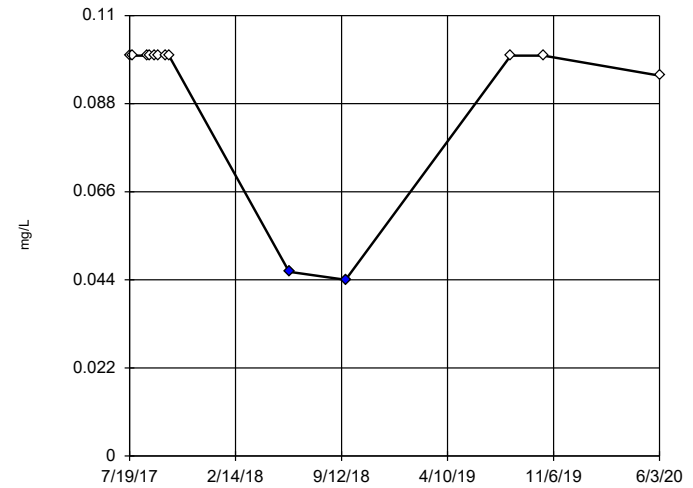


n = 13
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 529.8, low cutoff = 88.06, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

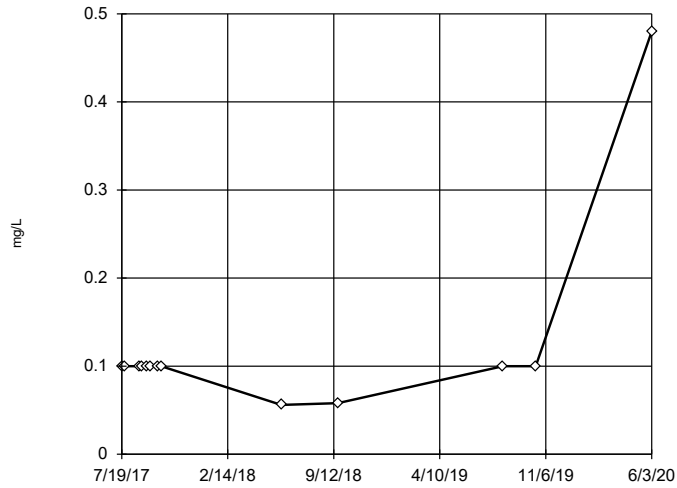
MW-1



n = 13
 Outliers are drawn as solid.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.1057, low cutoff = 0.08818, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

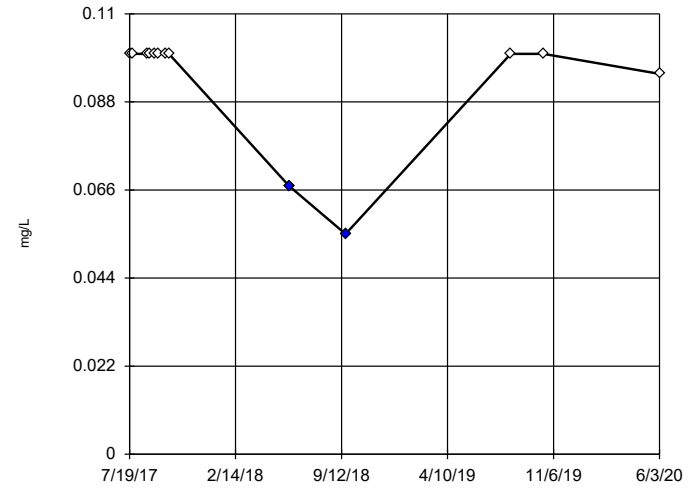
Tukey's Outlier Screening
MW-2



n = 13
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Fluoride Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

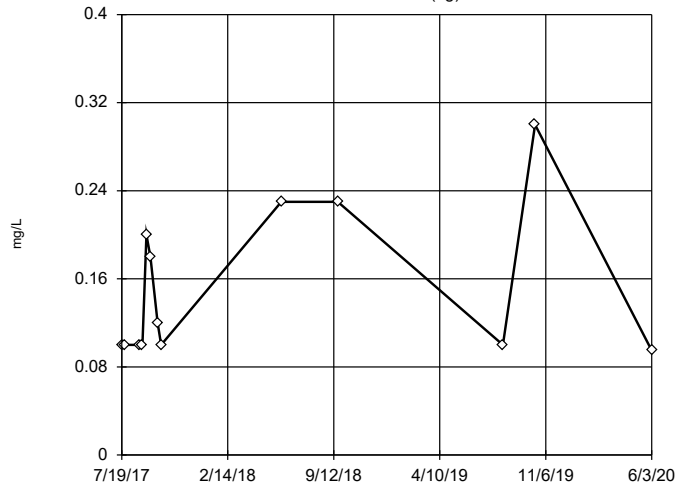
Tukey's Outlier Screening
MW-3



n = 13
Outliers are drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x*6 transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.1057, low cutoff = 0.08818, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

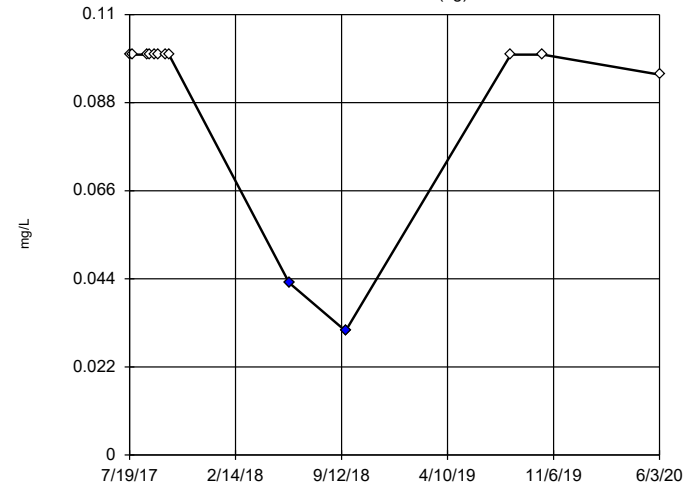
Tukey's Outlier Screening
MW-4 (bg)



n = 13
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 2.116, low cutoff = 0.01014, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening
MW-5 (bg)

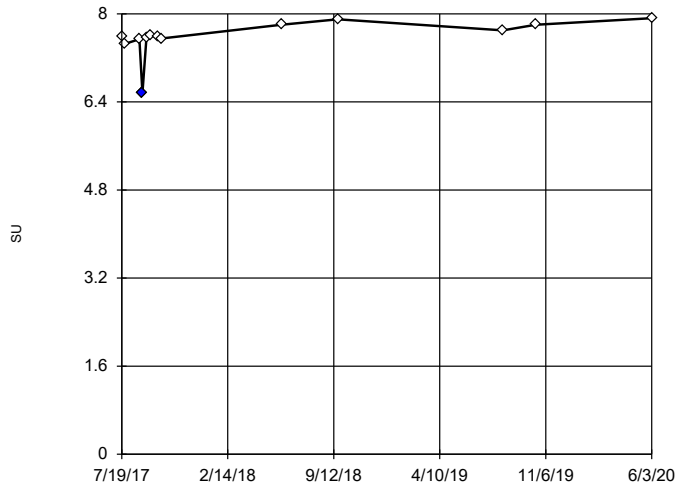


n = 13
Outliers are drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x*6 transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.1057, low cutoff = 0.08818, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/4/2020 8:08 AM
Client: GEI Data: Shiras Database

Dixon's Outlier Test

MW-1

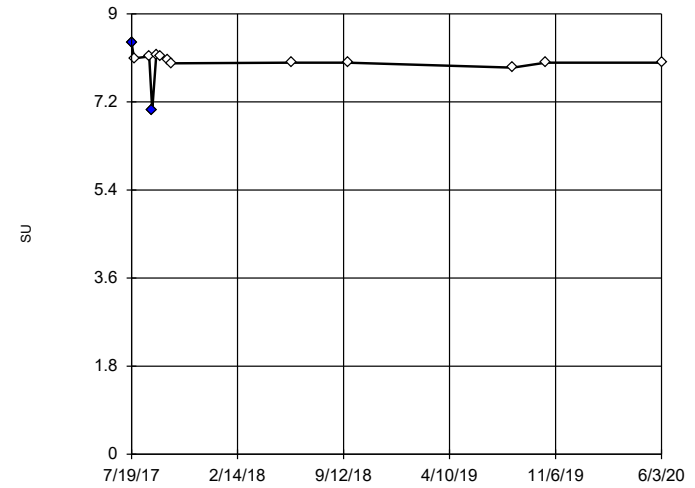


n = 13
 Statistical outlier is drawn as solid.
 Testing for 1 low outlier.
 Mean = 7.58.
 Std. Dev. = 0.3403.
 6.56: c = 0.7313
 tab1 = 0.521.
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.897
 Critical = 0.883
 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test

MW-2

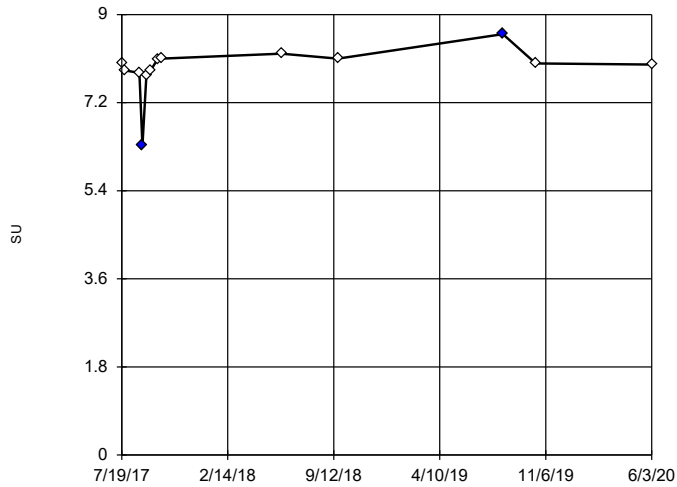


n = 13
 Statistical outliers are drawn as solid.
 Testing for 1 high and 1 low outlier.
 Mean = 7.992.
 Std. Dev. = 0.3146.
 8.41: c = 0.549
 tab1 = 0.521.
 7.03: c = 0.8571
 tab1 = 0.521.
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9066
 Critical = 0.876
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test

MW-3

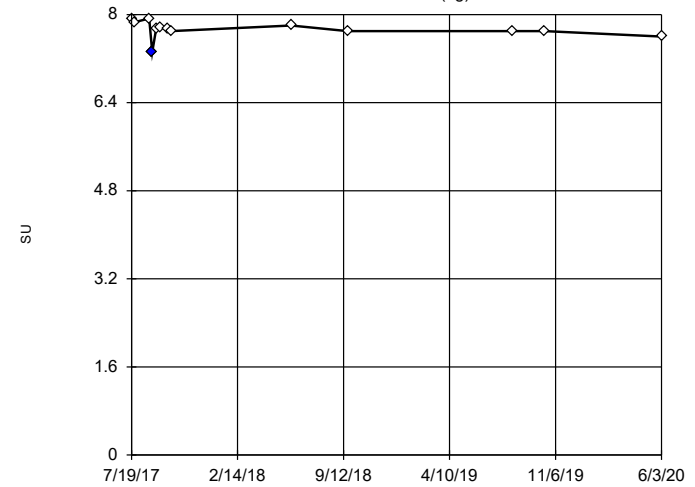


n = 13
 Statistical outliers are drawn as solid.
 Testing for 1 high and 1 low outlier.
 Mean = 7.898.
 Std. Dev. = 0.5203.
 8.6: c = 0.6024
 tab1 = 0.521.
 6.32: c = 0.7926
 tab1 = 0.521.
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9413
 Critical = 0.876
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test

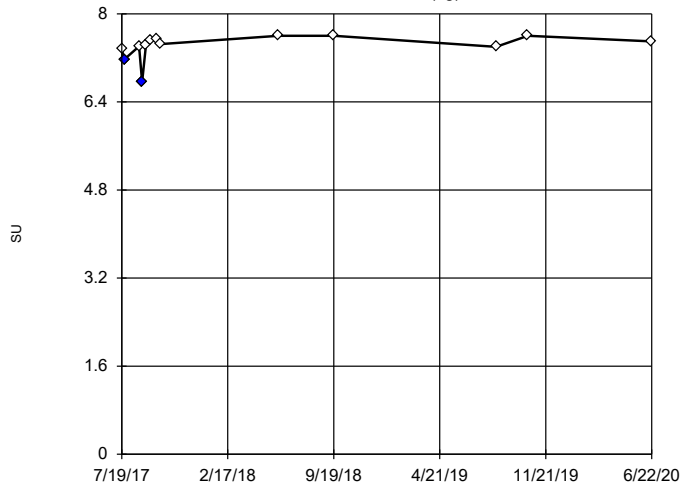
MW-4 (bg)



n = 13
 Statistical outlier is drawn as solid.
 Testing for 1 low outlier.
 Mean = 7.73.
 Std. Dev. = 0.1551.
 7.32: c = 0.6333
 tab1 = 0.521.
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9256
 Critical = 0.883
 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

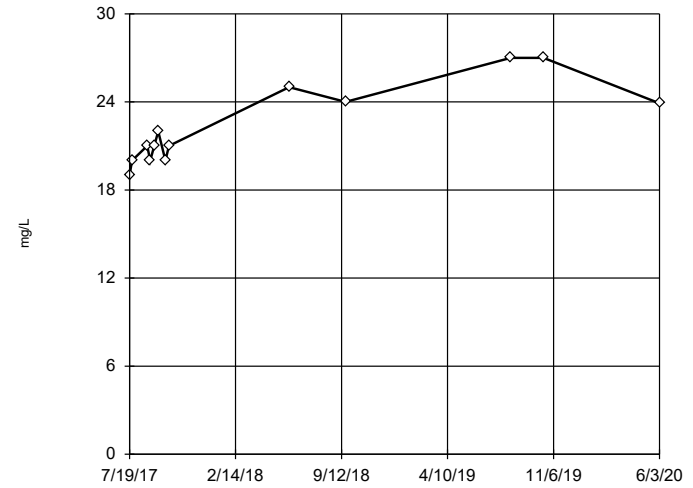
Dixon's Outlier Test MW-5 (bg)



n = 13
 Statistical outliers are drawn as solid. Testing for 2 low outliers.
 Mean = 7.41.
 Std. Dev. = 0.2288.
 7.17; c = 0.5349
 tab1 = 0.521.
 Alpha = 0.05.
 Normality test used: Shapiro Wilk@alpha = 0.1
 Calculated = 0.9153
 Critical = 0.876
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

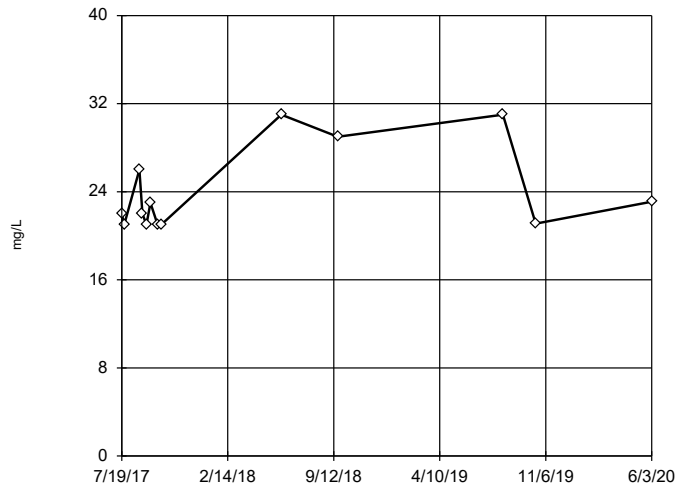
EPA Screening (suspected outliers for Dixon's Test) MW-1



n = 13
 Dixon's will not be run. No suspect values identified or unable to establish suspect values.
 Mean 22.38, std. dev. 2.72, critical Tn 2.331
 Normality test used: Shapiro Wilk@alpha = 0.1
 Calculated = 0.9017
 Critical = 0.889 (after natural log transformation)
 The distribution was found to be log-normal.

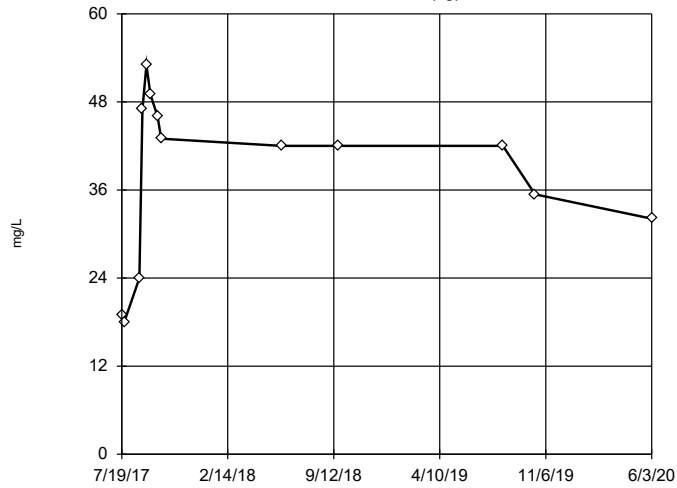
Constituent: Sulfate Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening MW-2



EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)

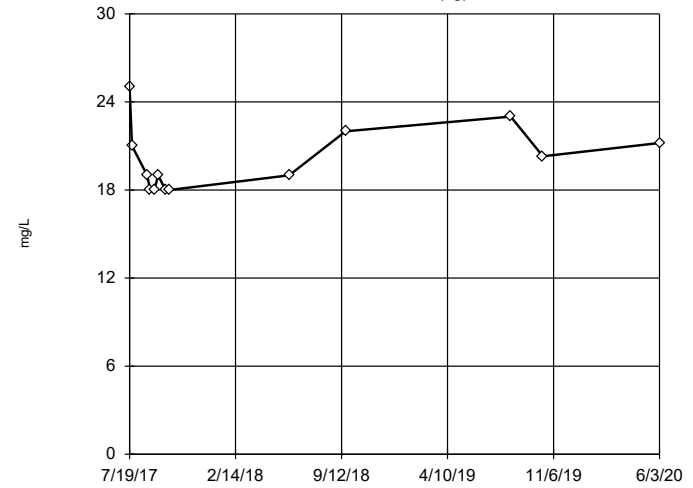


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 37.86, std. dev. 11.41, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.8994
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Sulfate Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)

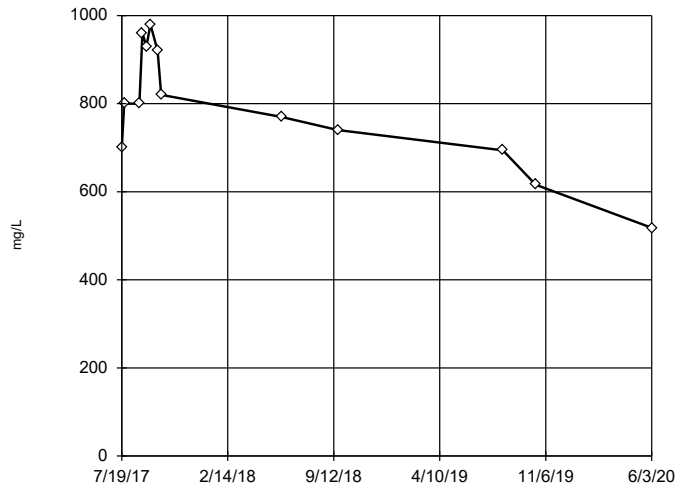


n = 13
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 37.3, low cutoff = 10.42, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-1

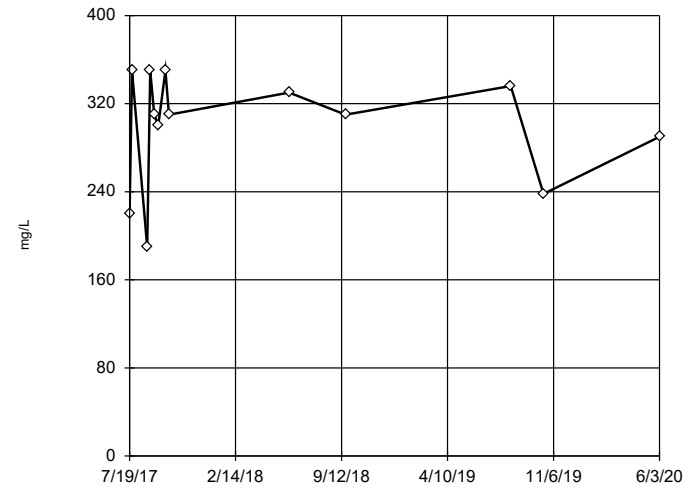


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 788.3, std. dev. 137.5, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.96
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

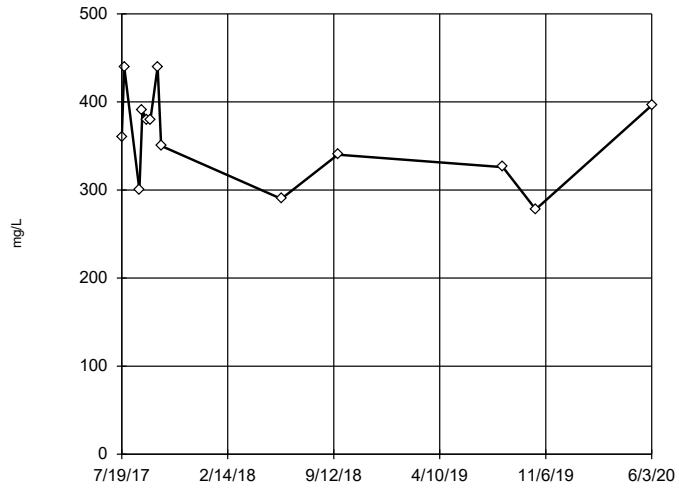


n = 13
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x⁵ transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 430.9, low cutoff = -386.9, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-3

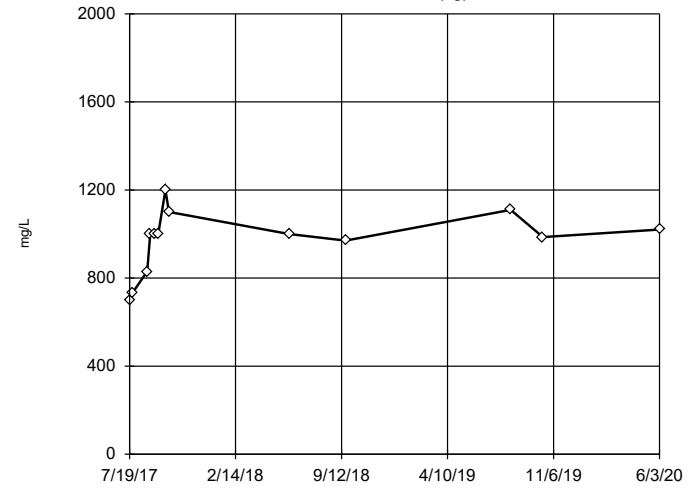


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 359.2, std. dev. 52.18, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9567
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)

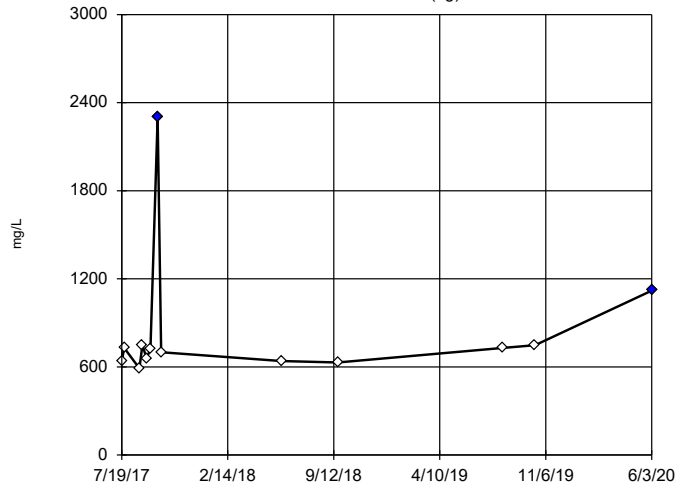


n = 13
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 972.8, std. dev. 143.1, critical Tn 2.331
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.8969
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test

MW-5 (bg)



n = 13
 Statistical outliers are drawn as solid.
 Testing for 2 high outliers.
 Mean = 842.9
 Std. Dev. = 456.8
 1120: c = 0.7592
 tab1 = 0.521
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.907
 Critical = 0.876
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:08 AM
 Client: GEI Data: Shiras Database

Appendix D2- Second Semi-Annual Statistical Evaluation

Prediction Limit - Significant Results

Client: GEI Data: Shiras Database Printed 11/4/2020, 9:09 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
pH [field] (SU)	MW-1	8.001	7.133	8/20/2020	8.1	Yes	29	0	No	0.001253	Param Inter 1 of 2
pH [field] (SU)	MW-3	8.001	7.133	8/20/2020	8.1	Yes	29	0	No	0.001253	Param Inter 1 of 2

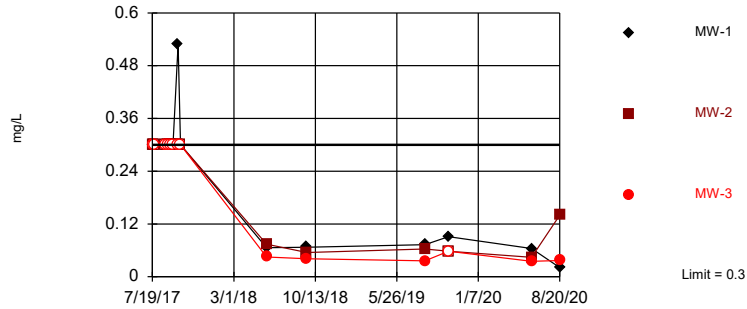
Prediction Limit - All Results

Client: GEI Data: Shiras Database Printed 11/4/2020, 9:09 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-1	0.3	n/a	8/20/2020	0.021	No	28	60.71	n/a	0.002286	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-2	0.3	n/a	8/20/2020	0.14	No	28	60.71	n/a	0.002286	NP Inter (NDs) 1 of 2
Boron (mg/L)	MW-3	0.3	n/a	8/20/2020	0.037	No	28	60.71	n/a	0.002286	NP Inter (NDs) 1 of 2
Calcium (mg/L)	MW-1	153.7	n/a	8/20/2020	37	No	28	0	No	0.002505	Param Inter 1 of 2
Calcium (mg/L)	MW-2	153.7	n/a	8/20/2020	55.1	No	28	0	No	0.002505	Param Inter 1 of 2
Calcium (mg/L)	MW-3	153.7	n/a	8/20/2020	66.2	No	28	0	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-1	466	n/a	8/20/2020	86.7	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-2	466	n/a	8/20/2020	66	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Chloride (mg/L)	MW-3	466	n/a	8/20/2020	104	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Fluoride (mg/L)	MW-1	0.3	n/a	8/20/2020	0.095ND	No	28	71.43	n/a	0.002286	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-2	0.3	n/a	8/20/2020	0.11	No	28	71.43	n/a	0.002286	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-3	0.3	n/a	8/20/2020	0.095ND	No	28	71.43	n/a	0.002286	NP Inter (NDs) 1 of 2
pH [field] (SU)	MW-1	8.001	7.133	8/20/2020	8.1	Yes	29	0	No	0.001253	Param Inter 1 of 2
pH [field] (SU)	MW-2	8.001	7.133	8/20/2020	8	No	29	0	No	0.001253	Param Inter 1 of 2
pH [field] (SU)	MW-3	8.001	7.133	8/20/2020	8.1	Yes	29	0	No	0.001253	Param Inter 1 of 2
Sulfate (mg/L)	MW-1	53	n/a	8/20/2020	10.4	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-2	53	n/a	8/20/2020	48.7	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Sulfate (mg/L)	MW-3	53	n/a	8/20/2020	27	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-1	2300	n/a	8/20/2020	276	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-2	2300	n/a	8/20/2020	336	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2
Total Dissolved Solids (mg/L)	MW-3	2300	n/a	8/20/2020	404	No	28	0	n/a	0.002286	NP Inter (normality) 1 of 2

Within Limit

Prediction Limit
 Interwell Non-parametric

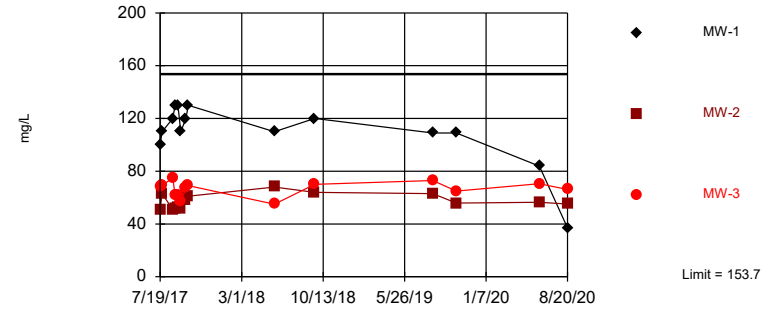


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 28 background values. 60.71% NDs. Annual per-constituent alpha = 0.01364. Individual comparison alpha = 0.002286 (1 of 2). Comparing 3 points to limit.

Constituent: Boron Analysis Run 11/4/2020 9:08 AM
 Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
 Interwell Parametric

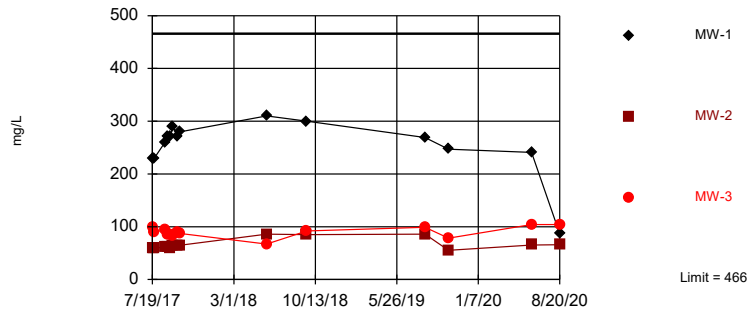


Background Data Summary: Mean=117.7, Std. Dev.=19.88, n=28. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9041, critical = 0.896. Kappa = 1.81 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Calcium Analysis Run 11/4/2020 9:08 AM
 Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
 Interwell Non-parametric

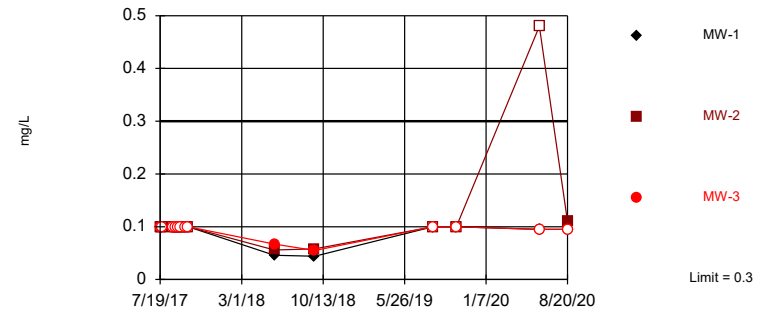


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 28 background values. Annual per-constituent alpha = 0.01364. Individual comparison alpha = 0.002286 (1 of 2). Comparing 3 points to limit.

Constituent: Chloride Analysis Run 11/4/2020 9:08 AM
 Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
 Interwell Non-parametric

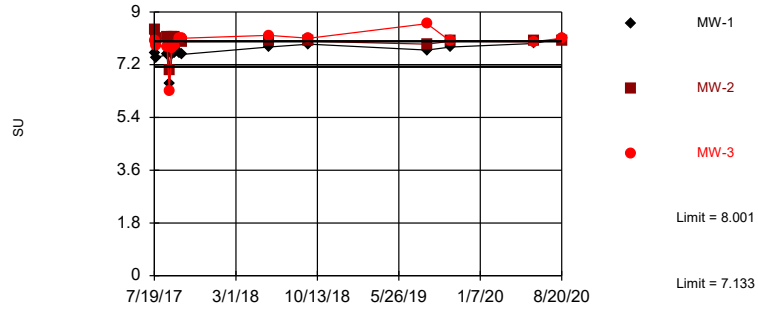


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 28 background values. 71.43% NDs. Annual per-constituent alpha = 0.01364. Individual comparison alpha = 0.002286 (1 of 2). Comparing 3 points to limit.

Constituent: Fluoride Analysis Run 11/4/2020 9:08 AM
 Client: GEI Data: Shiras Database

Exceeds Limits: MW-1, MW-3

Prediction Limit
Interwell Parametric

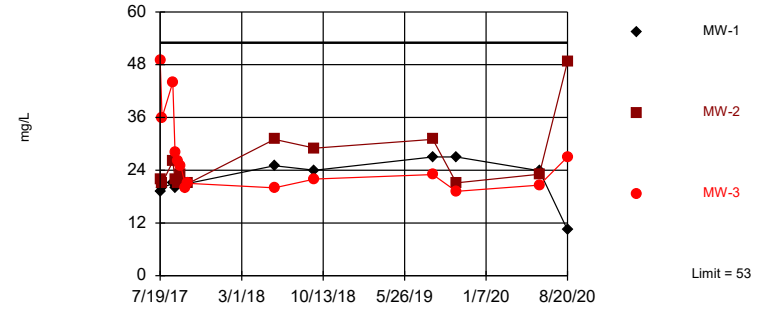


Background Data Summary: Mean=7.567, Std. Dev.=0.241, n=29. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.916, critical = 0.898. Kappa = 1.802 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001253. Comparing 3 points to limit.

Constituent: pH [field] Analysis Run 11/4/2020 9:08 AM
Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
Interwell Non-parametric

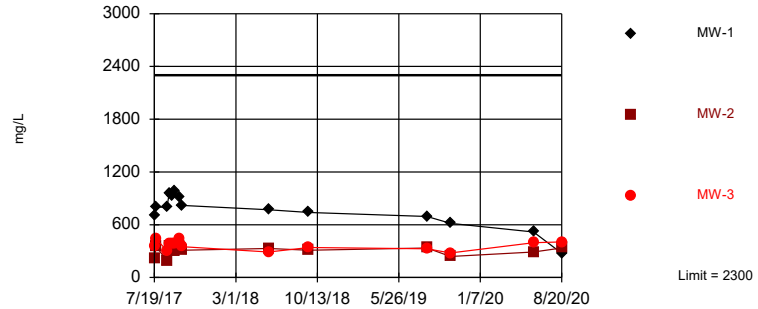


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 28 background values. Annual per-constituent alpha = 0.01364. Individual comparison alpha = 0.002286 (1 of 2). Comparing 3 points to limit.

Constituent: Sulfate Analysis Run 11/4/2020 9:08 AM
Client: GEI Data: Shiras Database

Within Limit

Prediction Limit
Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 28 background values. Annual per-constituent alpha = 0.01364. Individual comparison alpha = 0.002286 (1 of 2). Comparing 3 points to limit.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 9:08 AM
Client: GEI Data: Shiras Database

Trend Test - Significant Results

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:51 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Barium, Total (mg/L)	MW-1	-0.06671	-26	-23	Yes	9	0	n/a	n/a	0.02	NP
Boron (mg/L)	MW-1	-0.08605	-46	-44	Yes	14	50	n/a	n/a	0.02	NP
Boron (mg/L)	MW-2	-0.05373	-49	-44	Yes	14	64.29	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3	-0.08783	-53	-44	Yes	14	64.29	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4 (bg)	-0.07248	-60	-44	Yes	14	57.14	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5 (bg)	-0.09108	-55	-44	Yes	14	64.29	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5 (bg)	17.83	59	44	Yes	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4 (bg)	73	67	44	Yes	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5 (bg)	36.26	53	44	Yes	14	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-1	0.1796	61	44	Yes	14	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-4 (bg)	-0.06249	-45	-44	Yes	14	0	n/a	n/a	0.02	NP
Radium 224 and 226 (pCi/L)	MW-1	-1.392	-24	-23	Yes	9	66.67	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3	-5.677	-48	-44	Yes	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-1	-120.6	-48	-44	Yes	14	0	n/a	n/a	0.02	NP

Trend Test - All Results

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:51 AM

<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Arsenic, Total (mg/L)	MW-1	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Arsenic, Total (mg/L)	MW-2	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Arsenic, Total (mg/L)	MW-3	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Arsenic, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Arsenic, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Barium, Total (mg/L)	MW-1	-0.06671	-26	-23	Yes	9	0	n/a	n/a	0.02	NP
Barium, Total (mg/L)	MW-2	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Barium, Total (mg/L)	MW-3	0	1	23	No	9	77.78	n/a	n/a	0.02	NP
Barium, Total (mg/L)	MW-4 (bg)	0	8	23	No	9	88.89	n/a	n/a	0.02	NP
Barium, Total (mg/L)	MW-5 (bg)	0	3	23	No	9	11.11	n/a	n/a	0.02	NP
Beryllium, Total (mg/L)	MW-1	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Beryllium, Total (mg/L)	MW-2	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Beryllium, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Beryllium, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Beryllium, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Boron (mg/L)	MW-1	-0.08605	-46	-44	Yes	14	50	n/a	n/a	0.02	NP
Boron (mg/L)	MW-2	-0.05373	-49	-44	Yes	14	64.29	n/a	n/a	0.02	NP
Boron (mg/L)	MW-3	-0.08783	-53	-44	Yes	14	64.29	n/a	n/a	0.02	NP
Boron (mg/L)	MW-4 (bg)	-0.07248	-60	-44	Yes	14	57.14	n/a	n/a	0.02	NP
Boron (mg/L)	MW-5 (bg)	-0.09108	-55	-44	Yes	14	64.29	n/a	n/a	0.02	NP
Cadmium, Total (mg/L)	MW-1	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Cadmium, Total (mg/L)	MW-2	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Cadmium, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Cadmium, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Cadmium, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-1	-5.87	-31	-44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-2	1.78	28	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-3	0.5239	5	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-4 (bg)	9.432	34	44	No	14	0	n/a	n/a	0.02	NP
Calcium (mg/L)	MW-5 (bg)	17.83	59	44	Yes	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-1	0	3	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-2	11.21	44	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-3	2.086	9	44	No	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-4 (bg)	73	67	44	Yes	14	0	n/a	n/a	0.02	NP
Chloride (mg/L)	MW-5 (bg)	36.26	53	44	Yes	14	0	n/a	n/a	0.02	NP
Chromium, Total (mg/L)	MW-1	0	-9	-23	No	9	88.89	n/a	n/a	0.02	NP
Chromium, Total (mg/L)	MW-2	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Chromium, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Chromium, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Chromium, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Cobalt, Total (mg/L)	MW-1	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Cobalt, Total (mg/L)	MW-2	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Cobalt, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Cobalt, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Cobalt, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-1	0	-29	-44	No	14	85.71	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-2	0	12	44	No	14	78.57	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-3	0	-29	-44	No	14	85.71	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-4 (bg)	0	4	44	No	14	57.14	n/a	n/a	0.02	NP
Fluoride (mg/L)	MW-5 (bg)	0	-29	-44	No	14	85.71	n/a	n/a	0.02	NP

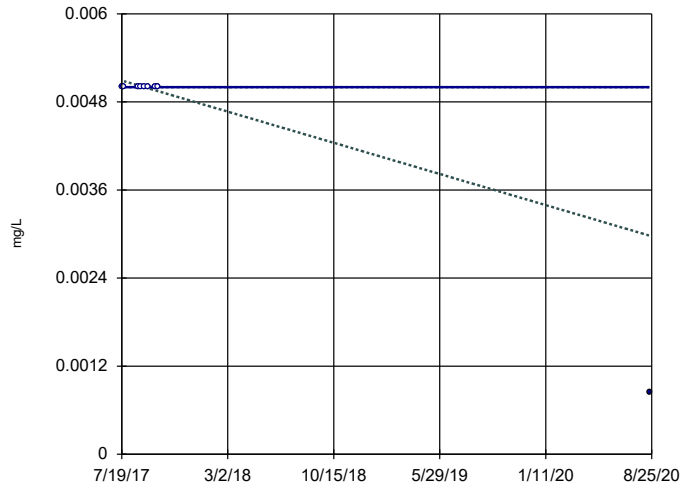
Trend Test - All Results

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:51 AM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
Lead, Total (mg/L)	MW-1	0	-15	-23	No	9	88.89	n/a	n/a	0.02	NP
Lead, Total (mg/L)	MW-2	0	-11	-23	No	9	88.89	n/a	n/a	0.02	NP
Lead, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Lead, Total (mg/L)	MW-4 (bg)	0	-3	-23	No	9	77.78	n/a	n/a	0.02	NP
Lead, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Lithium, Total (mg/L)	MW-1	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Lithium, Total (mg/L)	MW-2	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Lithium, Total (mg/L)	MW-3	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Lithium, Total (mg/L)	MW-4 (bg)	0	3	23	No	9	66.67	n/a	n/a	0.02	NP
Lithium, Total (mg/L)	MW-5 (bg)	0	14	23	No	9	77.78	n/a	n/a	0.02	NP
Mercury, Total (mg/L)	MW-1	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Mercury, Total (mg/L)	MW-2	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Mercury, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Mercury, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Mercury, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Molybdenum, Total (mg/L)	MW-1	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Molybdenum, Total (mg/L)	MW-2	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Molybdenum, Total (mg/L)	MW-3	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Molybdenum, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Molybdenum, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
pH [field] (SU)	MW-1	0.1796	61	44	Yes	14	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-2	-0.0547	-36	-44	No	14	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-3	0.1116	35	44	No	14	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-4 (bg)	-0.06249	-45	-44	Yes	14	0	n/a	n/a	0.02	NP
pH [field] (SU)	MW-5 (bg)	0.08058	37	48	No	15	0	n/a	n/a	0.02	NP
Radium 224 and 226 (pCi/L)	MW-1	-1.392	-24	-23	Yes	9	66.67	n/a	n/a	0.02	NP
Radium 224 and 226 (pCi/L)	MW-2	0	-13	-23	No	9	66.67	n/a	n/a	0.02	NP
Radium 224 and 226 (pCi/L)	MW-3	0	-3	-23	No	9	66.67	n/a	n/a	0.02	NP
Radium 224 and 226 (pCi/L)	MW-4 (bg)	0	1	23	No	9	77.78	n/a	n/a	0.02	NP
Radium 224 and 226 (pCi/L)	MW-5 (bg)	0	-7	-23	No	9	66.67	n/a	n/a	0.02	NP
Selenium, Total (mg/L)	MW-1	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Selenium, Total (mg/L)	MW-2	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Selenium, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Selenium, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Selenium, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	88.89	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-1	2.793	38	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-2	2.232	31	44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-3	-5.677	-48	-44	Yes	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-4 (bg)	-2.135	-10	-44	No	14	0	n/a	n/a	0.02	NP
Sulfate (mg/L)	MW-5 (bg)	0.8629	22	44	No	14	0	n/a	n/a	0.02	NP
Thallium, Total (mg/L)	MW-1	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Thallium, Total (mg/L)	MW-2	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Thallium, Total (mg/L)	MW-3	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Thallium, Total (mg/L)	MW-4 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Thallium, Total (mg/L)	MW-5 (bg)	0	-8	-23	No	9	100	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-1	-120.6	-48	-44	Yes	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-2	0	2	44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-3	-12.94	-13	-44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-4 (bg)	56.87	38	44	No	14	0	n/a	n/a	0.02	NP
Total Dissolved Solids (mg/L)	MW-5 (bg)	74.83	29	44	No	14	0	n/a	n/a	0.02	NP

Sen's Slope and 95% Confidence Band

MW-1

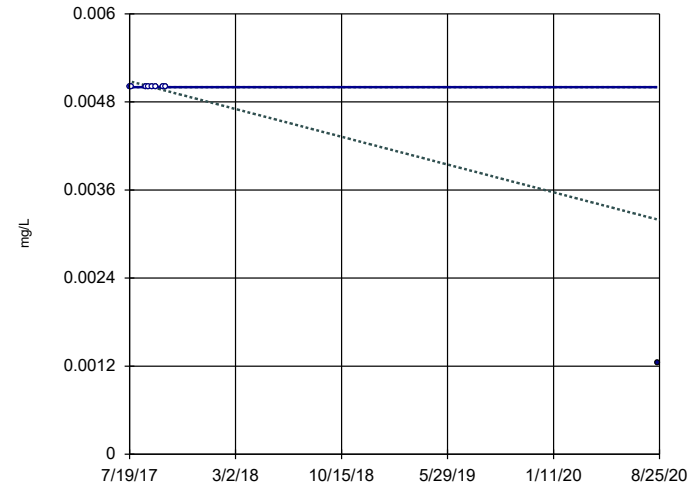


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

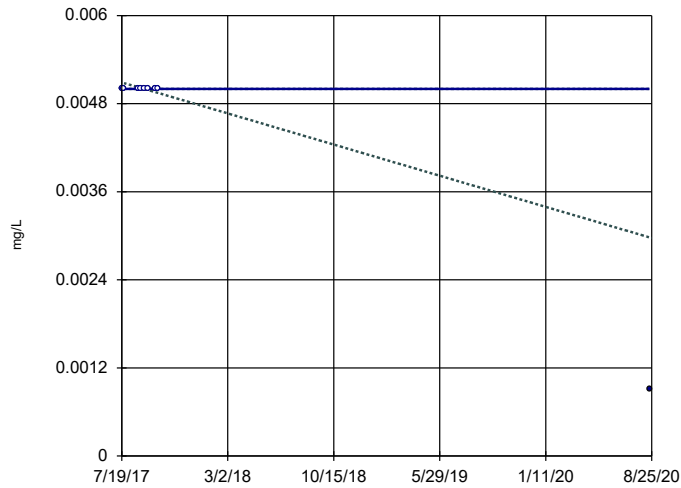


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

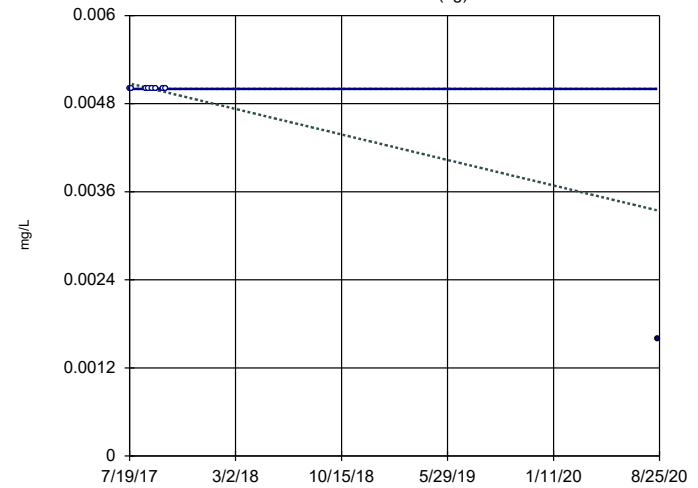


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

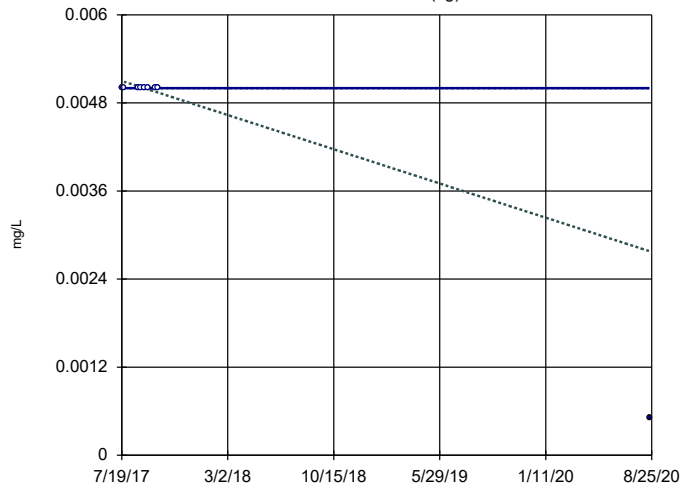
MW-4 (bg)



n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

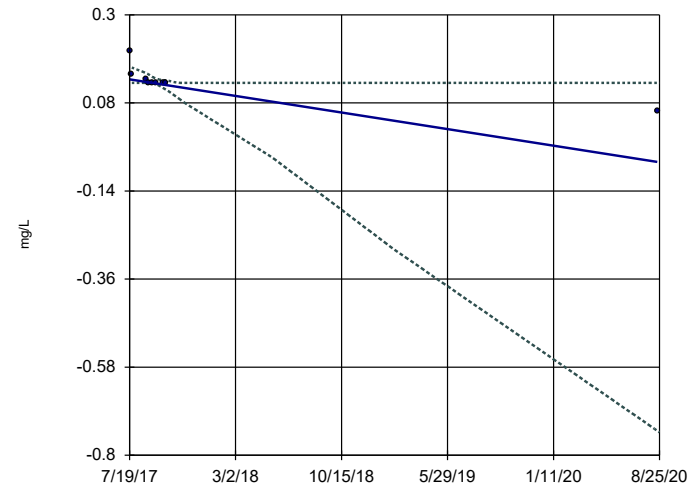
Sen's Slope and 95% Confidence Band
 MW-5 (bg)



n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:45 AM
 Client: GEI Data: Shiras Database

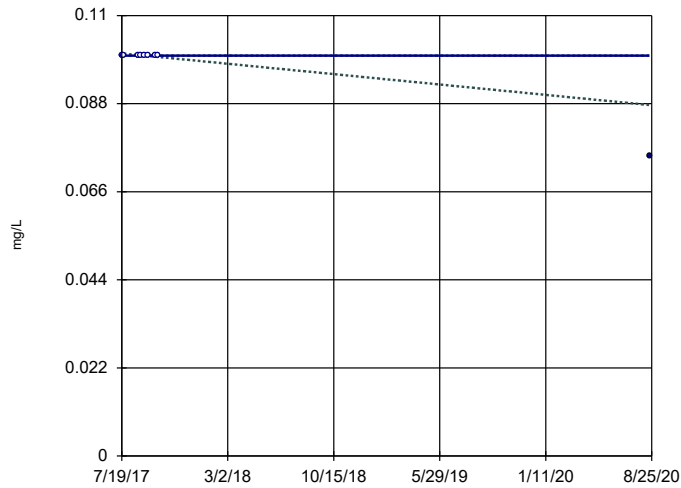
Sen's Slope and 95% Confidence Band
 MW-1



n = 9
 Slope = -0.06671
 units per year.
 Mann-Kendall
 statistic = -26
 critical = -23
 Decreasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Barium, Total Analysis Run 11/4/2020 8:45 AM
 Client: GEI Data: Shiras Database

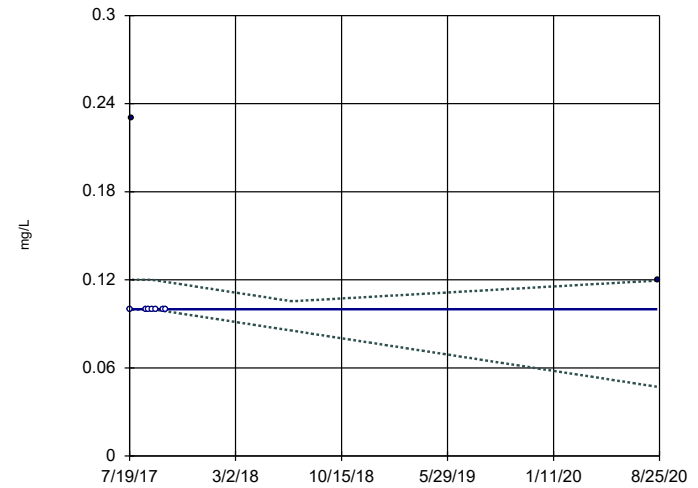
Sen's Slope and 95% Confidence Band
 MW-2



n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Barium, Total Analysis Run 11/4/2020 8:45 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band
 MW-3

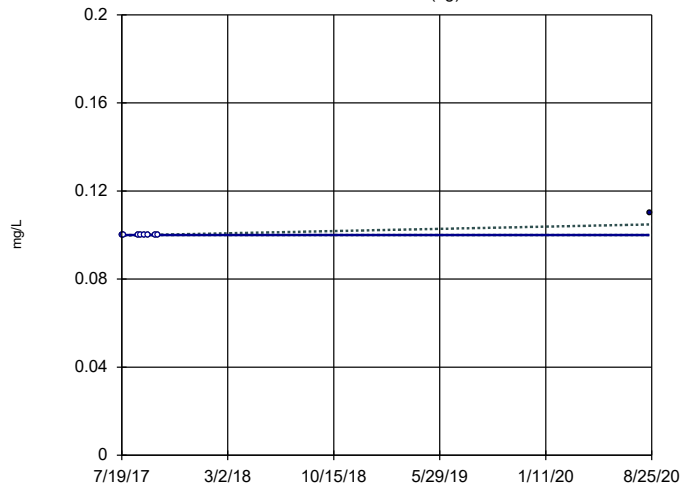


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = 1
 critical = 23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Barium, Total Analysis Run 11/4/2020 8:45 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

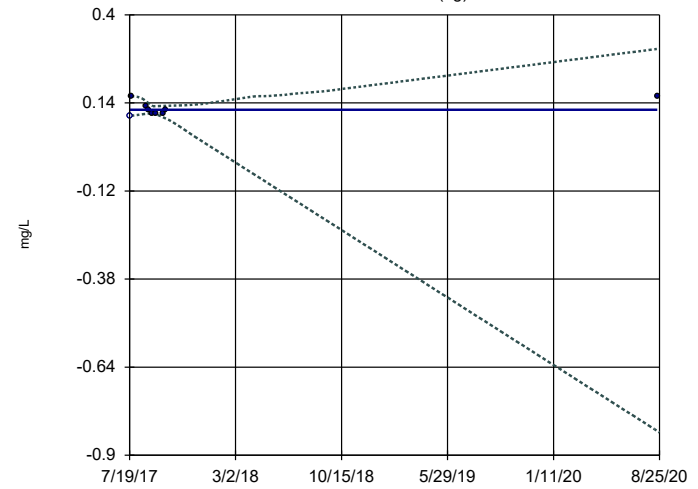


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = 8
critical = 23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Barium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

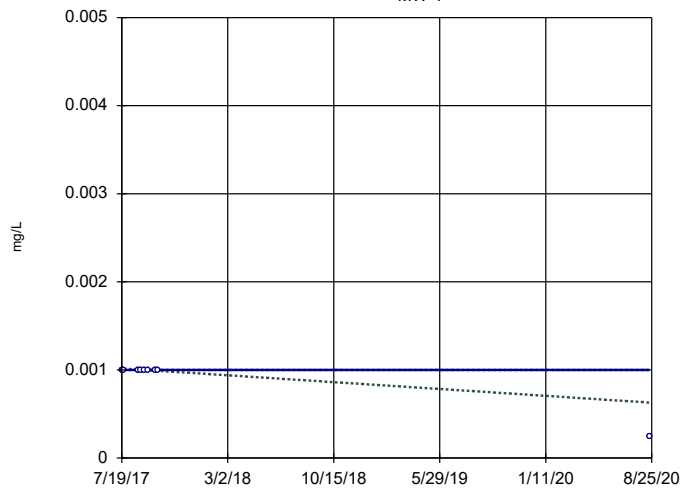


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = 3
critical = 23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Barium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

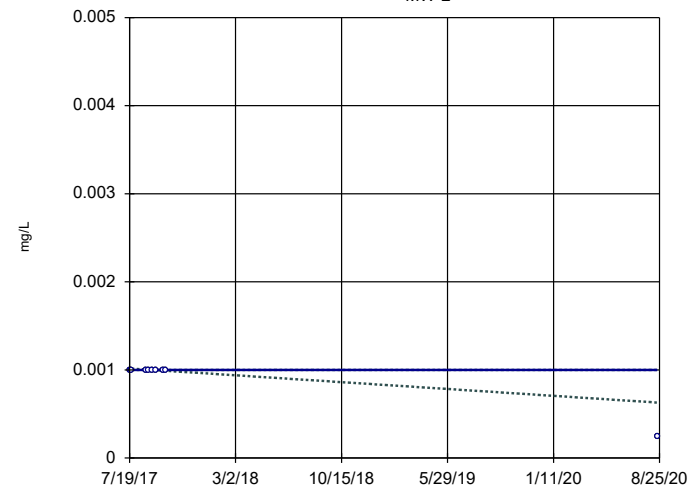


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

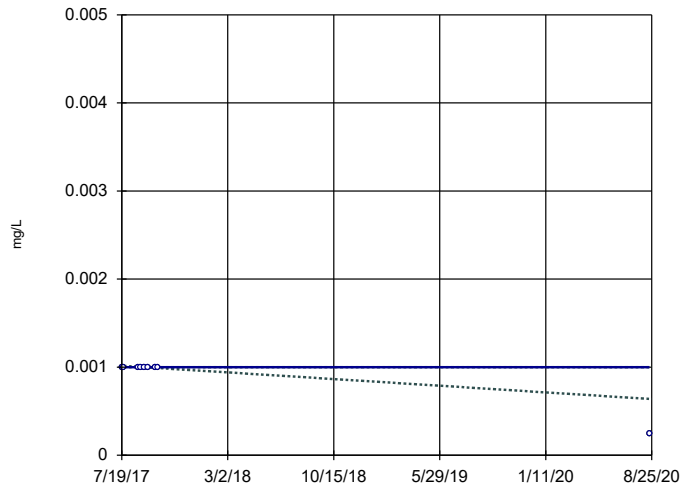


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

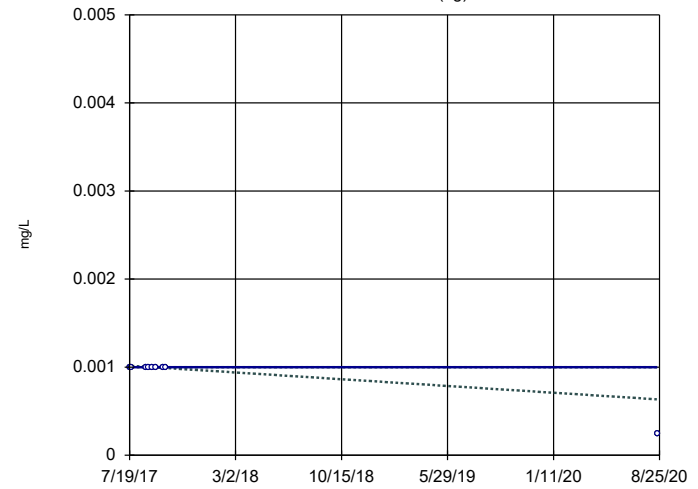


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

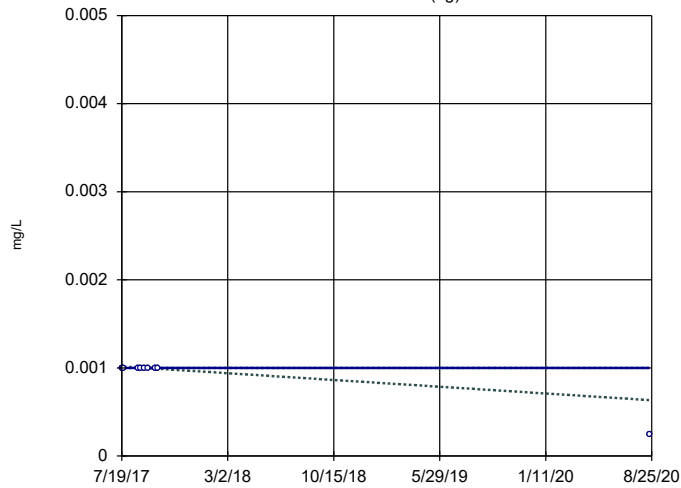


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

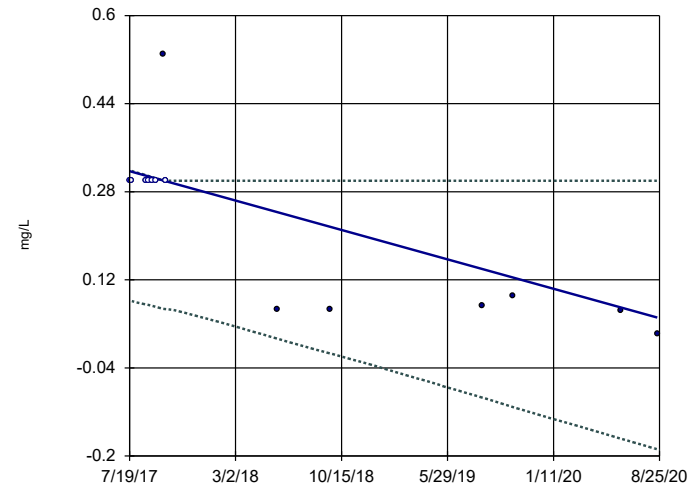


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

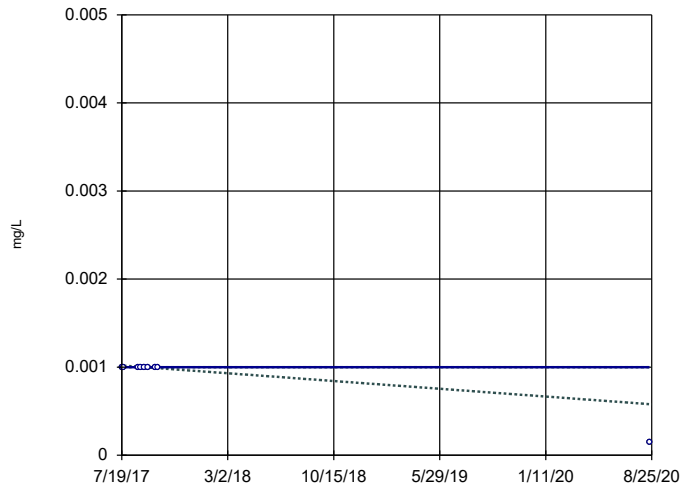


n = 14
Slope = -0.08605
units per year.
Mann-Kendall
statistic = -46
critical = -44
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Boron Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

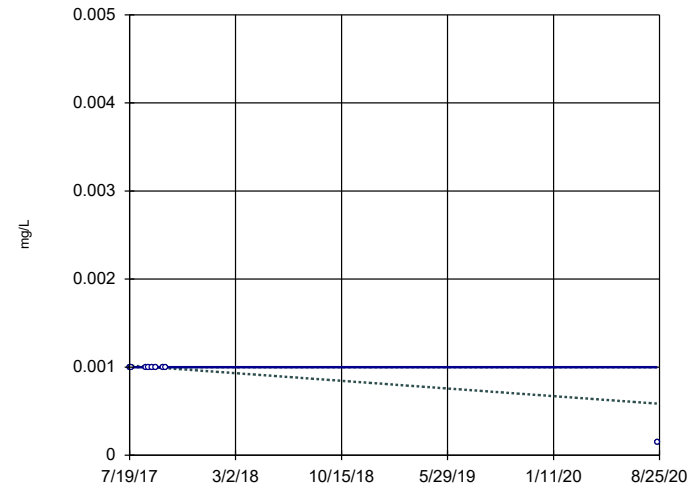


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:45 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

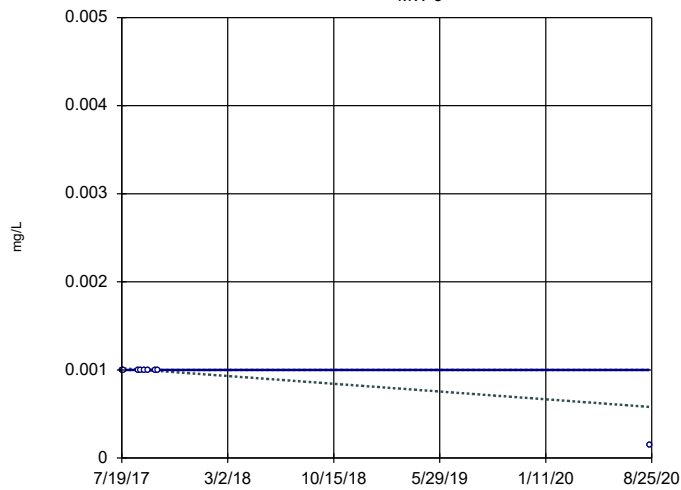


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

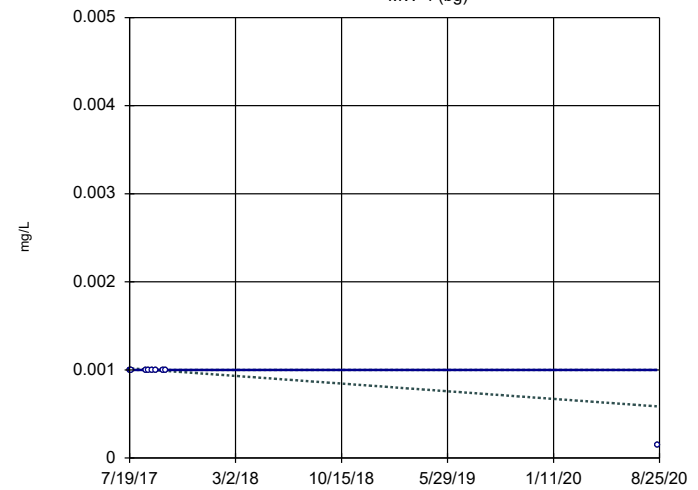


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

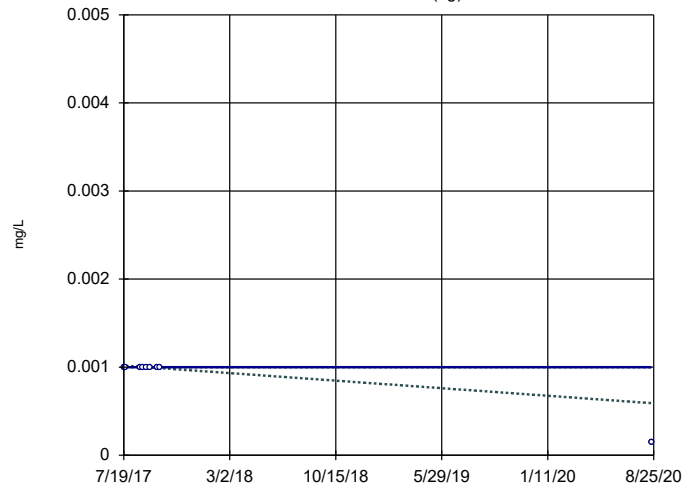


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

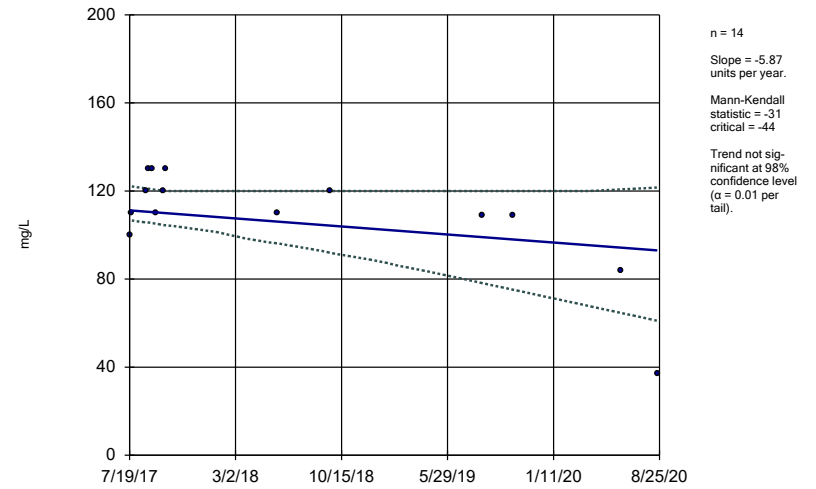
MW-5 (bg)



Constituent: Cadmium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

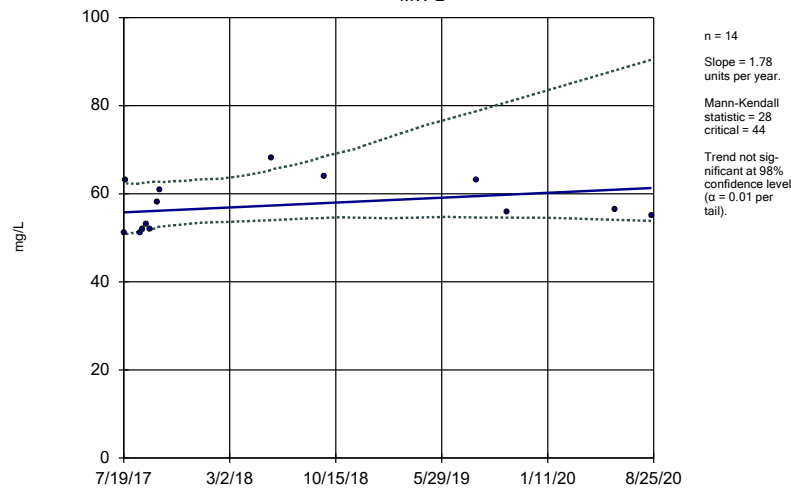
MW-1



Constituent: Calcium Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

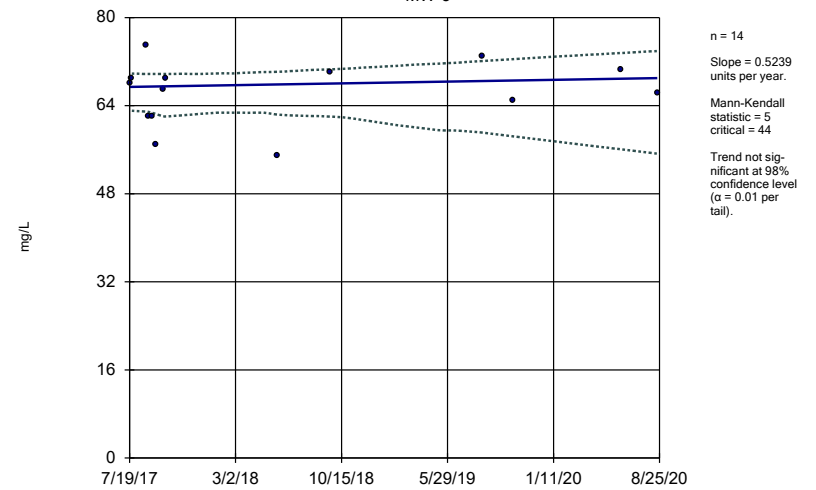
MW-2



Constituent: Calcium Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

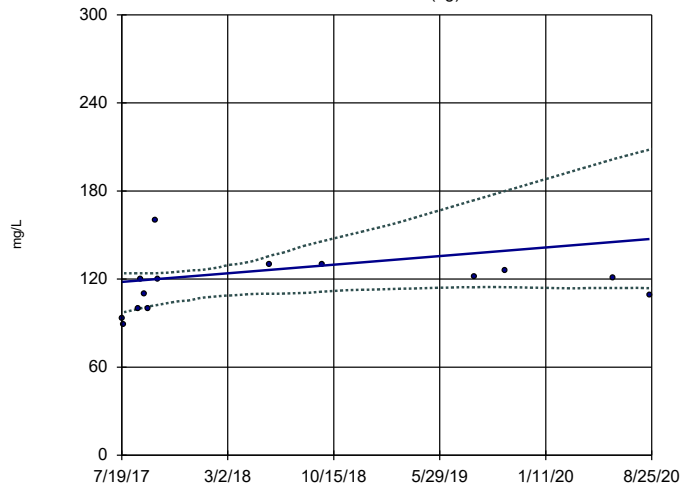
MW-3



Constituent: Calcium Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

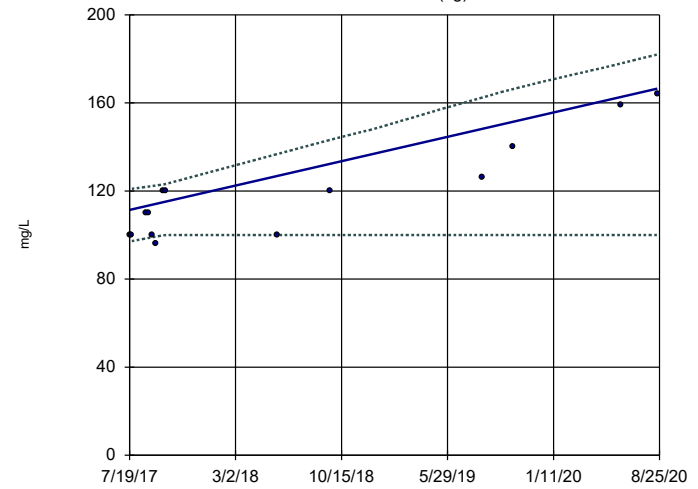


n = 14
 Slope = 9.432
 units per year.
 Mann-Kendall
 statistic = 34
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Calcium Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

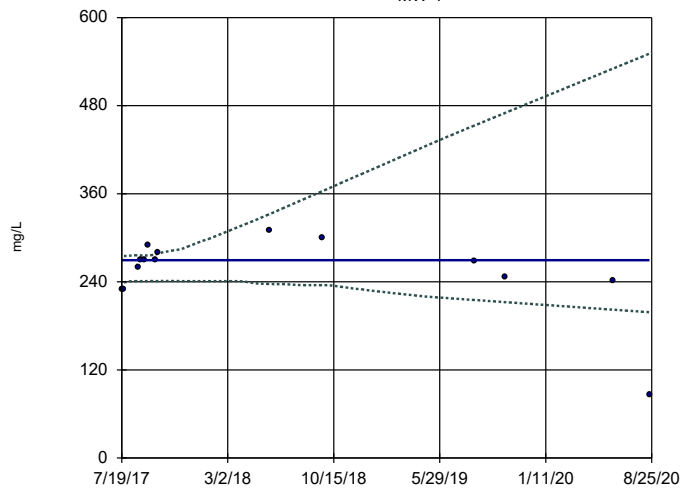


n = 14
 Slope = 17.83
 units per year.
 Mann-Kendall
 statistic = 59
 critical = 44
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Calcium Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

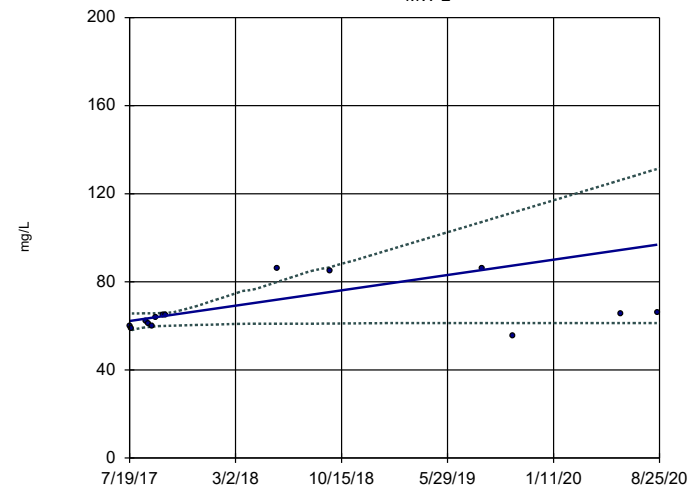


n = 14
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = 3
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

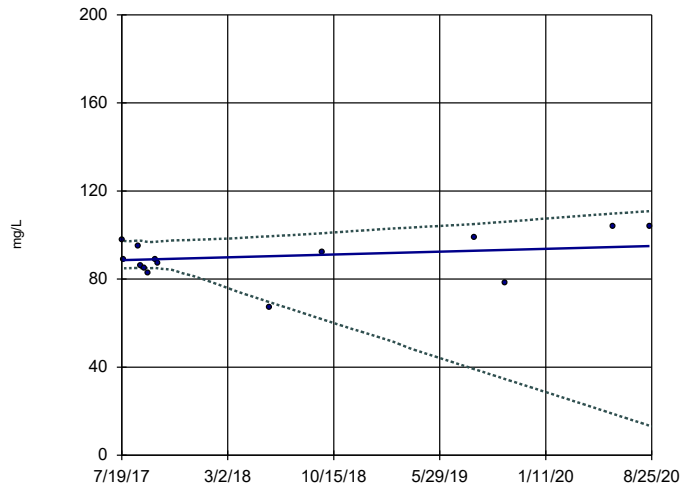


n = 14
 Slope = 11.21
 units per year.
 Mann-Kendall
 statistic = 44
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

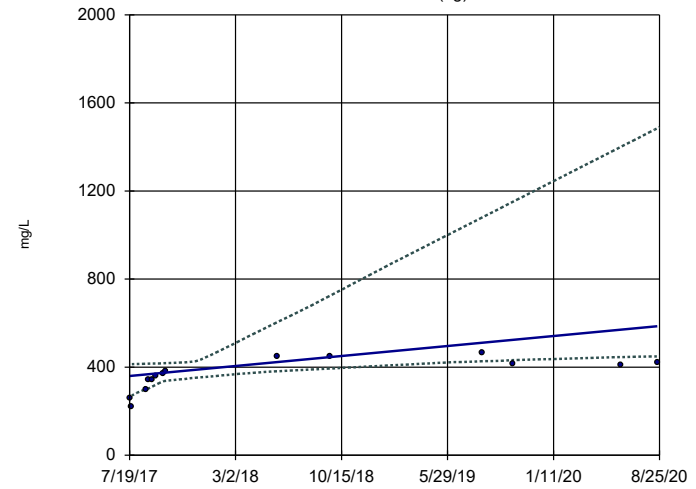


n = 14
 Slope = 2.086
 units per year.
 Mann-Kendall
 statistic = 9
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

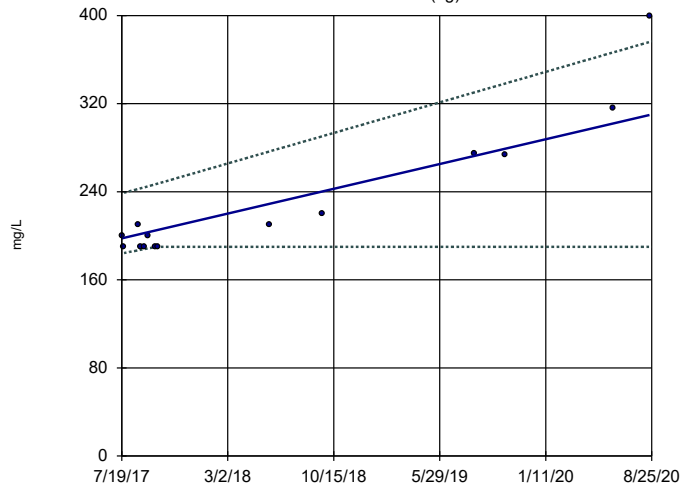


n = 14
 Slope = 73
 units per year.
 Mann-Kendall
 statistic = 67
 critical = 44
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

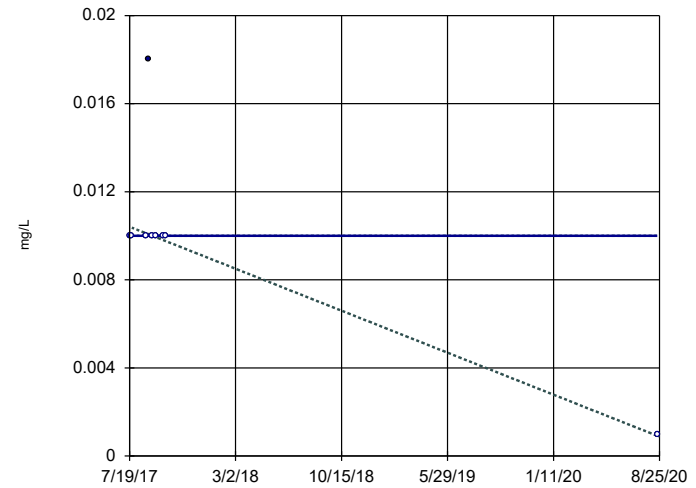


n = 14
 Slope = 36.26
 units per year.
 Mann-Kendall
 statistic = 53
 critical = 44
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chloride Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

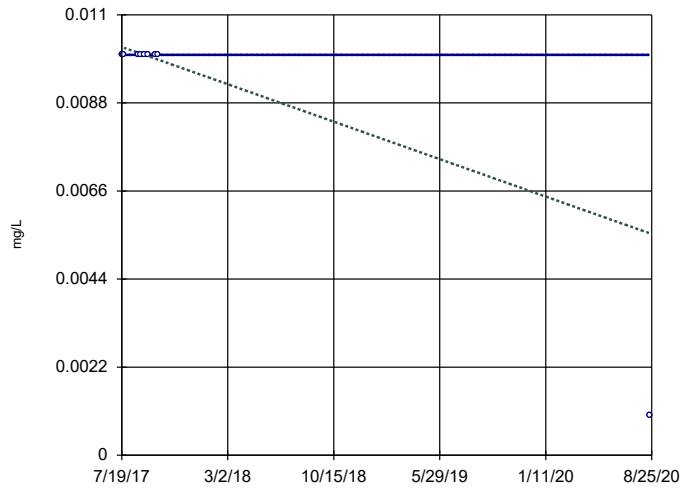


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -9
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Chromium, Total Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

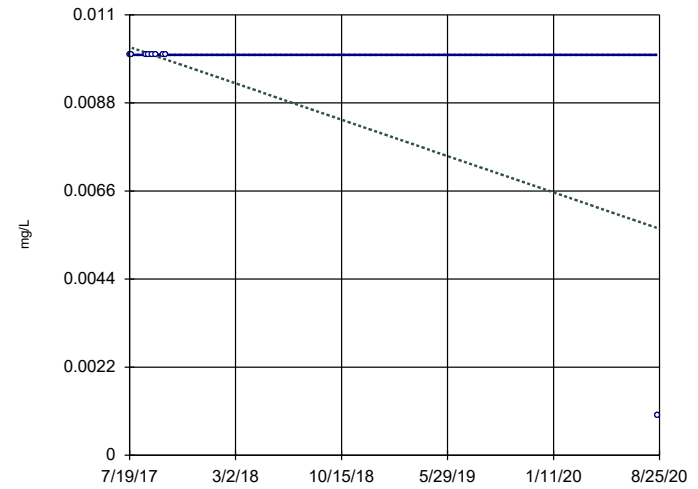


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Chromium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

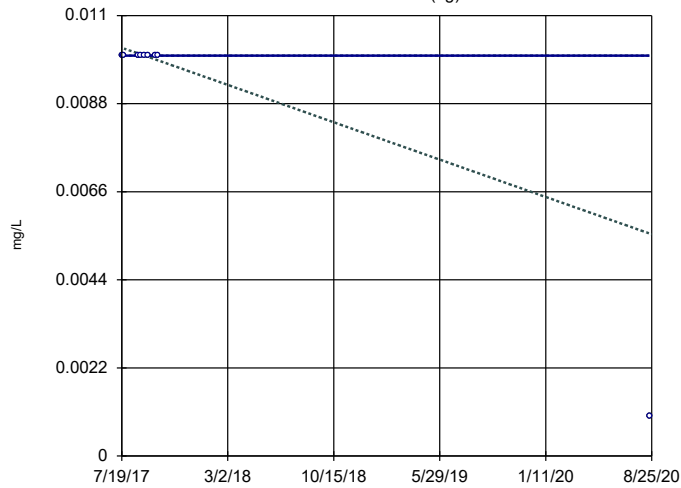


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Chromium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

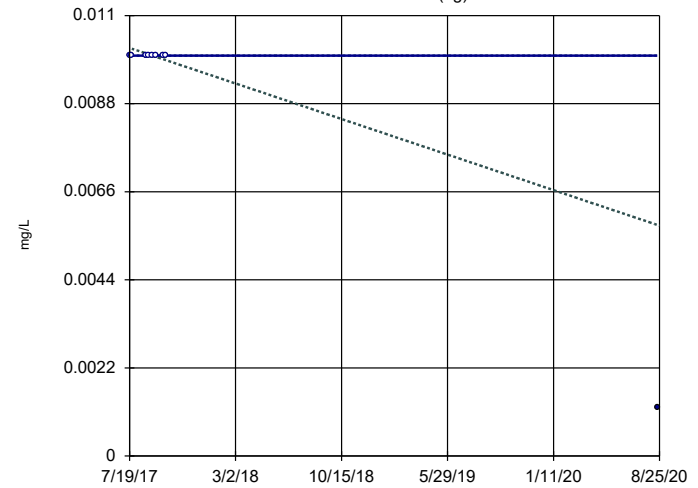


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Chromium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

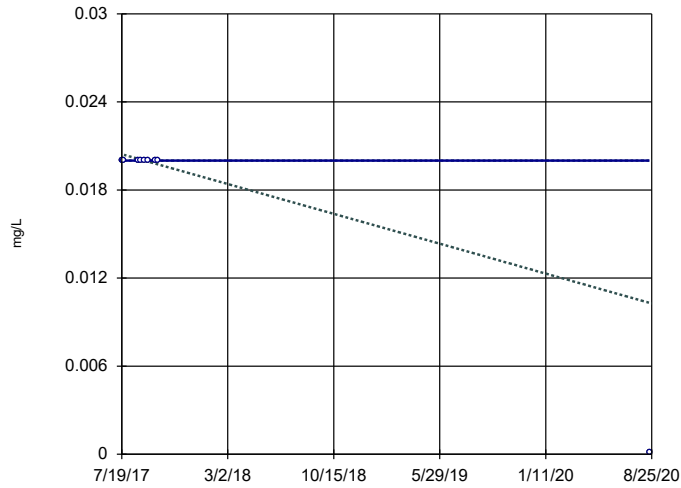


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Chromium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

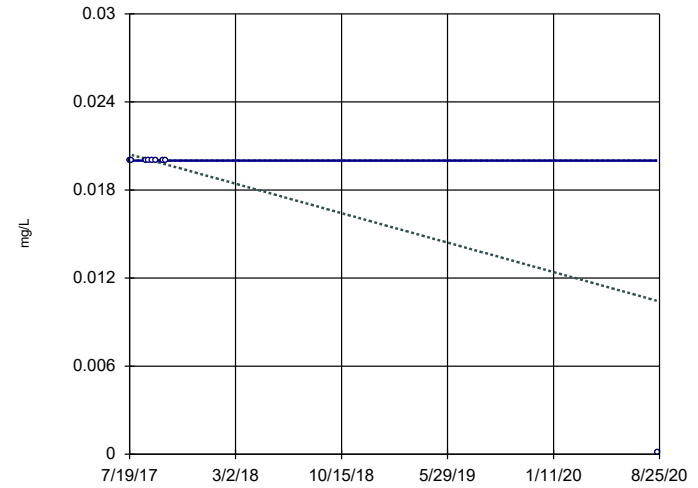


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

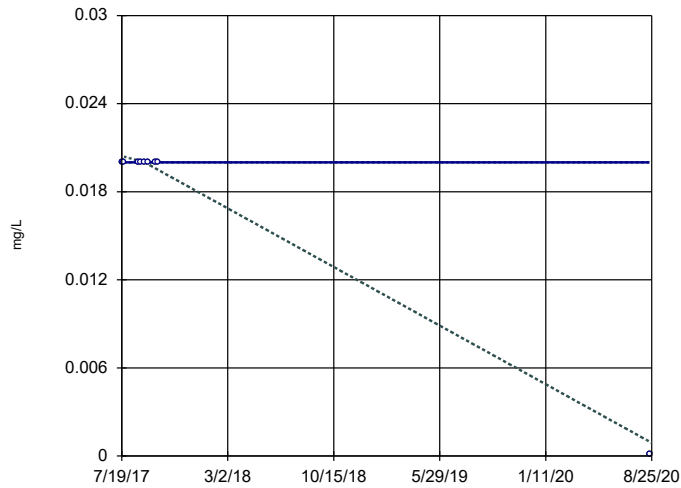


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

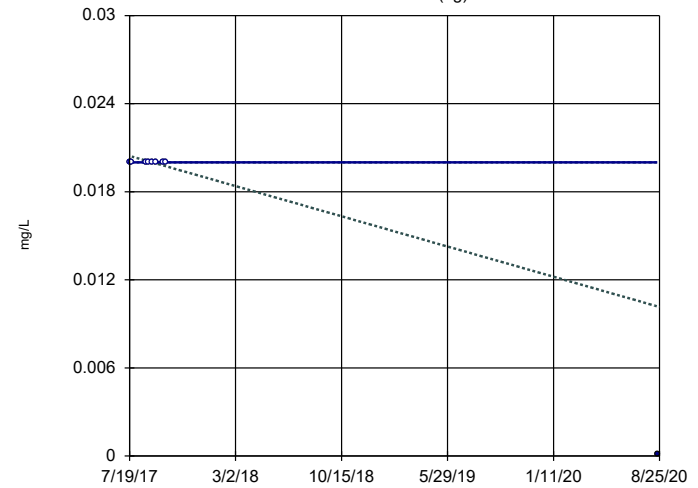


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

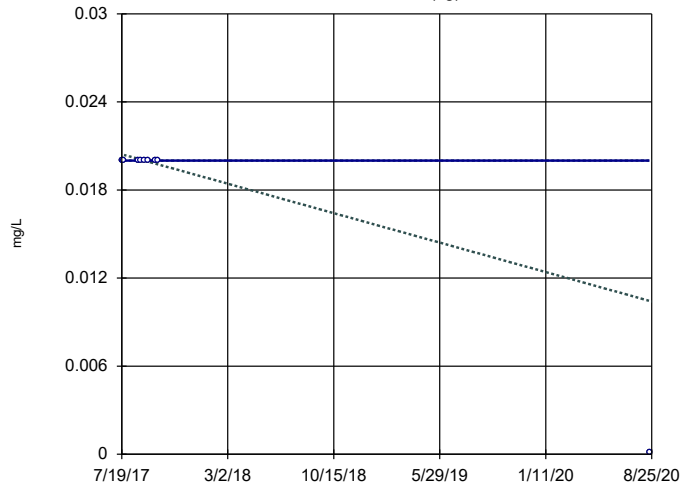
MW-4 (bg)



n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

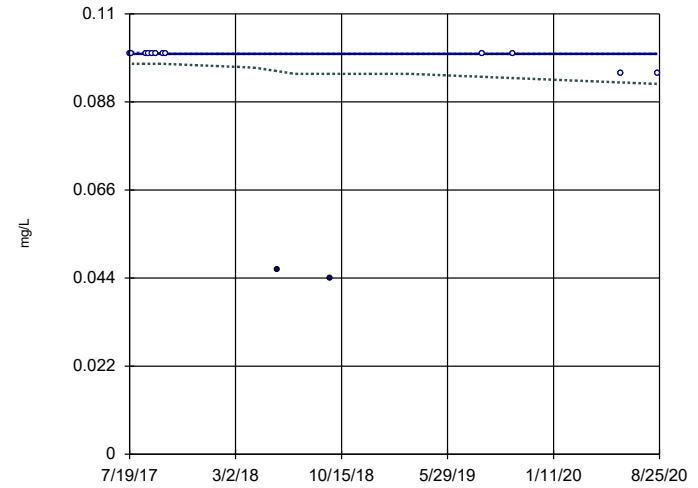
Sen's Slope and 95% Confidence Band
MW-5 (bg)



n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

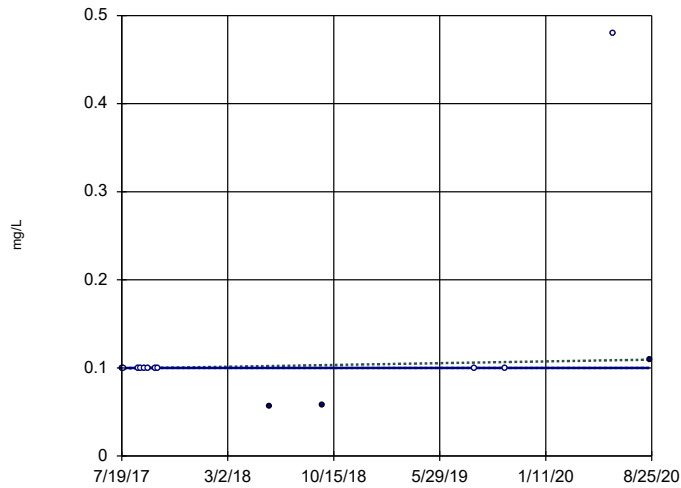
Sen's Slope and 95% Confidence Band
MW-1



n = 14
Slope = 0
units per year.
Mann-Kendall
statistic = -29
critical = -44
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

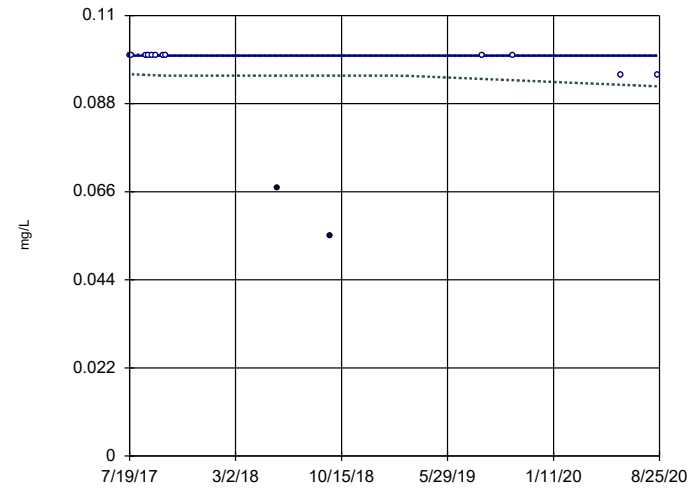
Sen's Slope and 95% Confidence Band
MW-2



n = 14
Slope = 0
units per year.
Mann-Kendall
statistic = 12
critical = 44
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band
MW-3

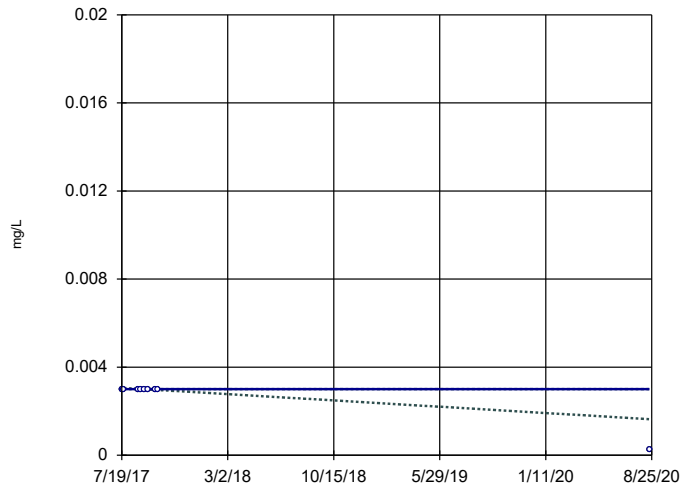


n = 14
Slope = 0
units per year.
Mann-Kendall
statistic = -29
critical = -44
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Fluoride Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

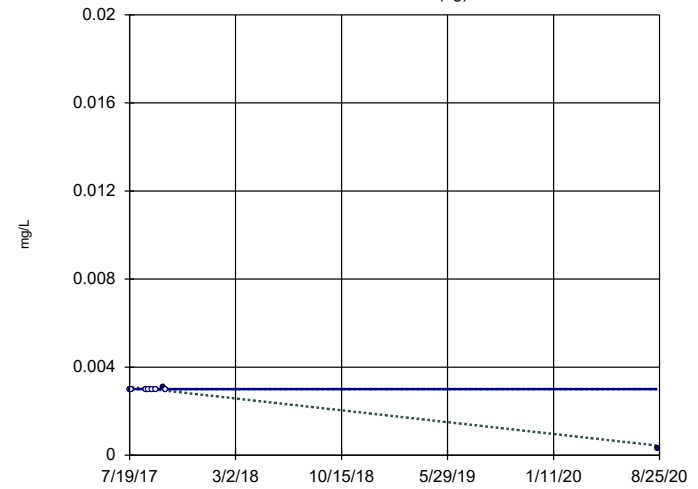


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Lead, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

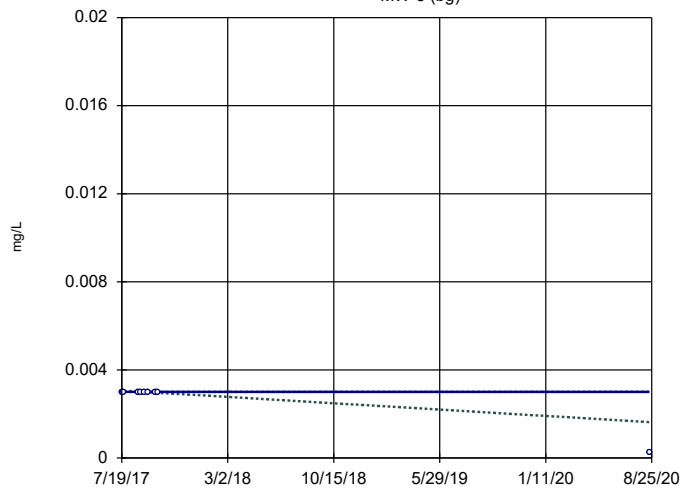


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -3
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Lead, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

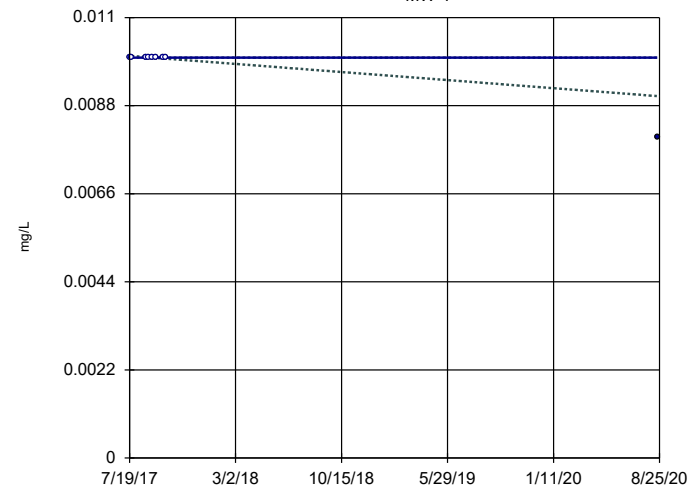


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Lead, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

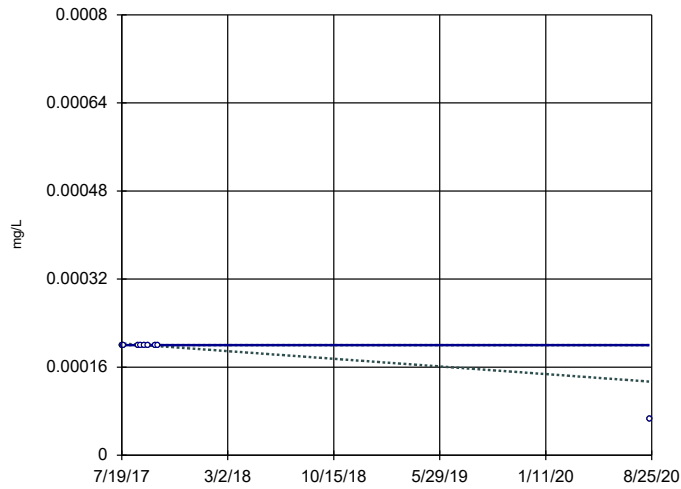


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Lithium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

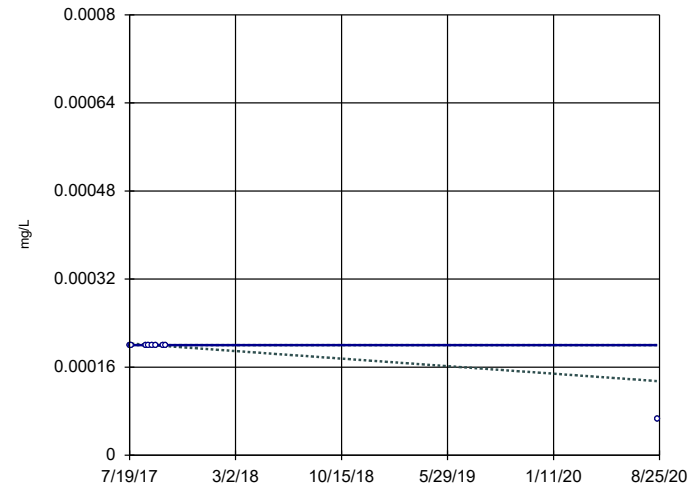


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Mercury, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

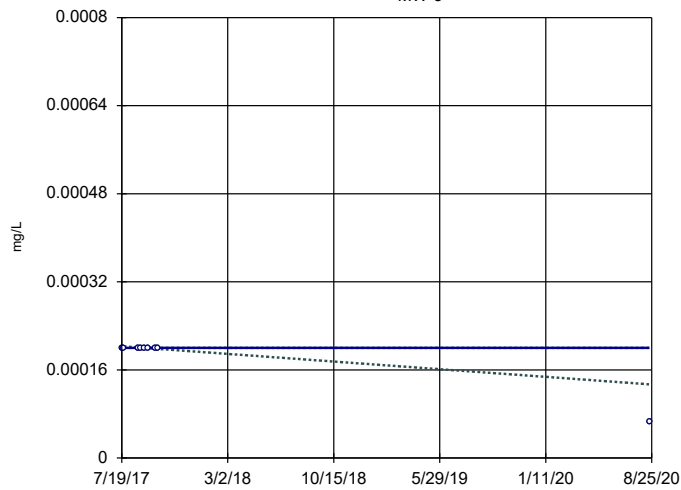


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Mercury, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

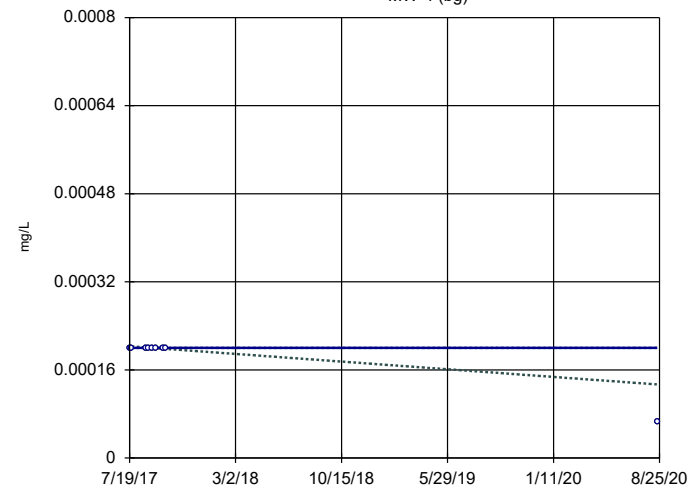


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Mercury, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

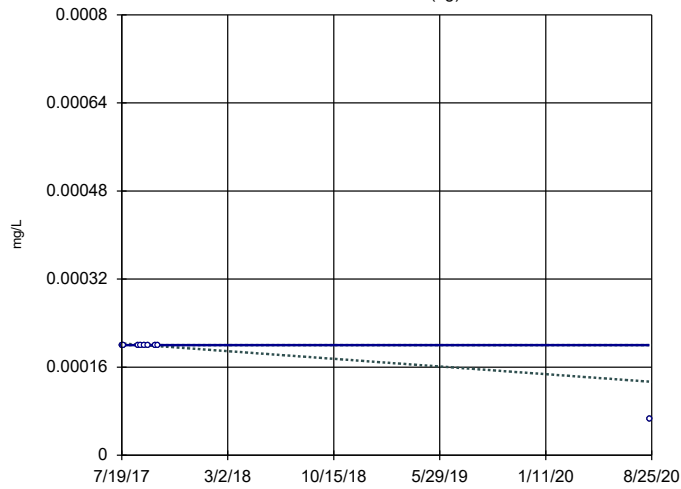


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Mercury, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

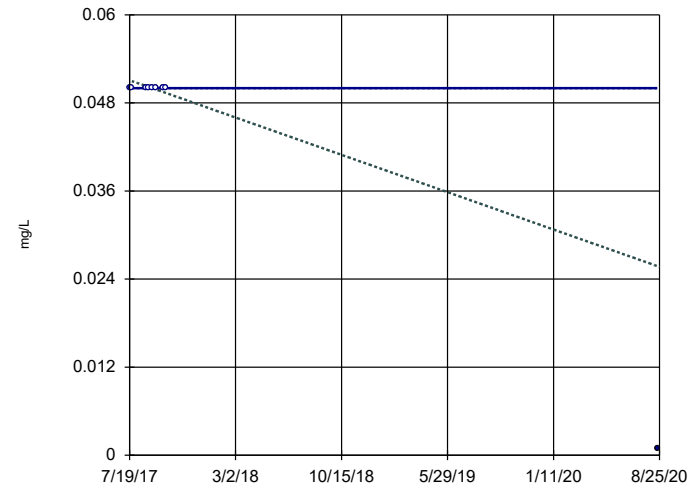


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Mercury, Total Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

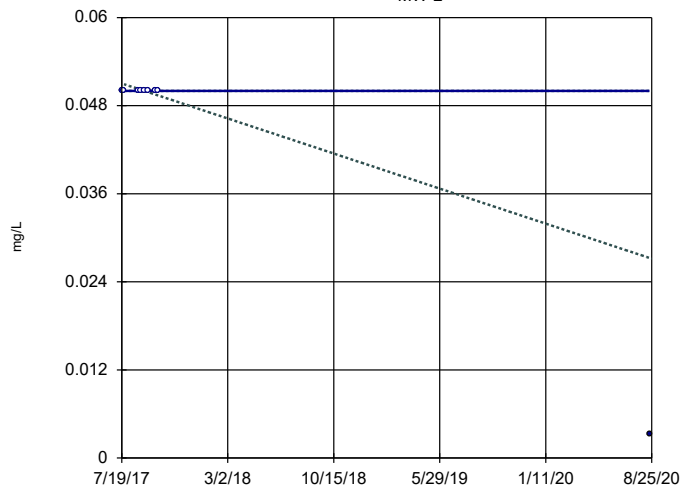


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

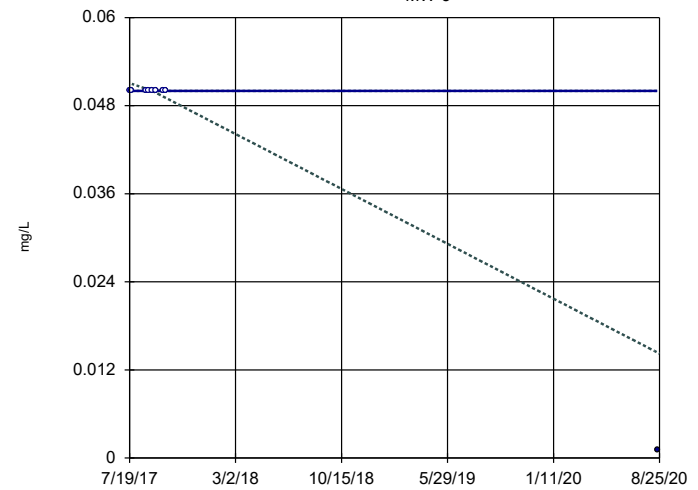


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

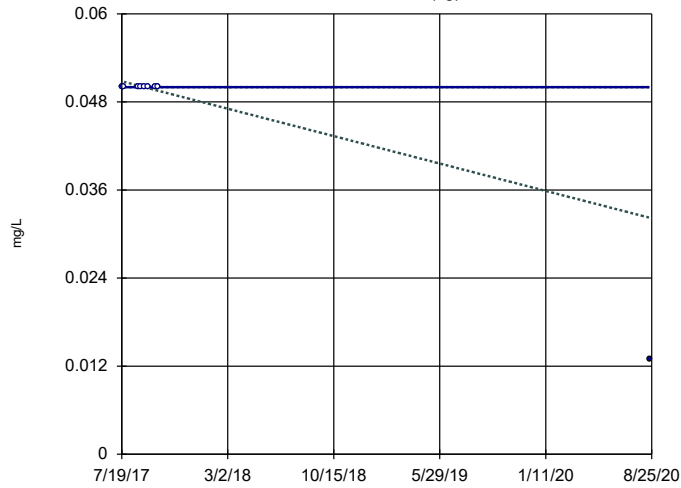


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

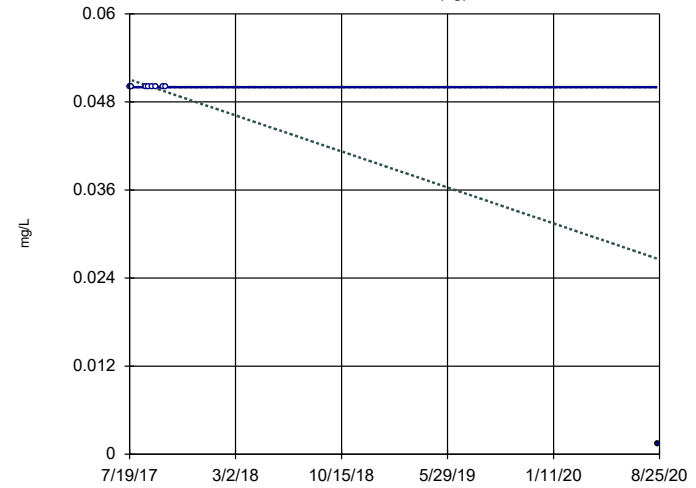


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

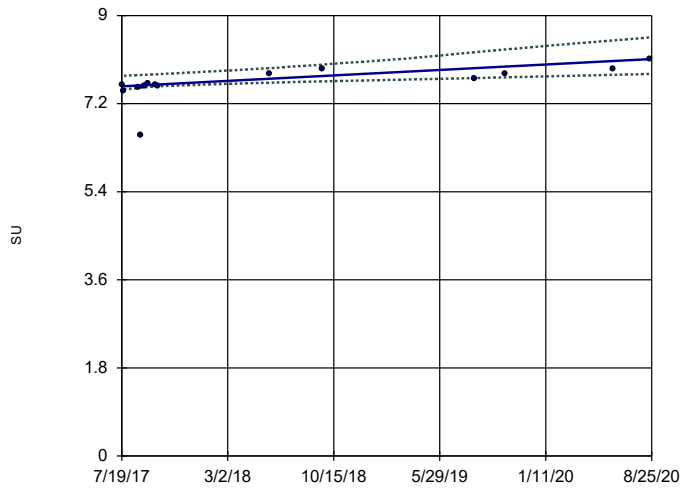


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

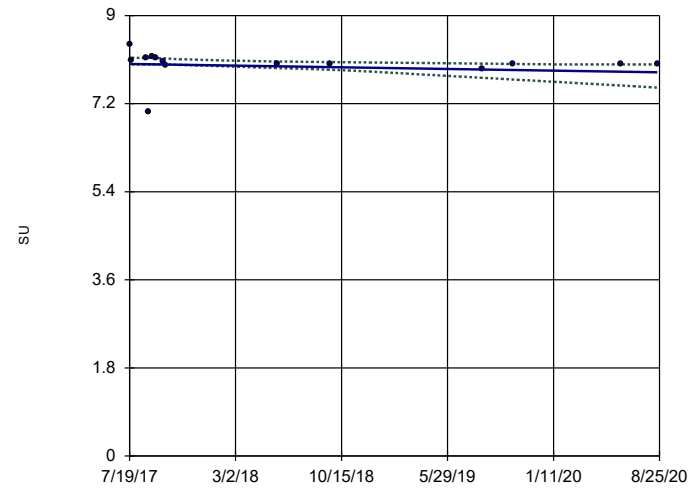


n = 14
 Slope = 0.1796
 units per year.
 Mann-Kendall
 statistic = 61
 critical = 44
 Increasing trend
 significant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

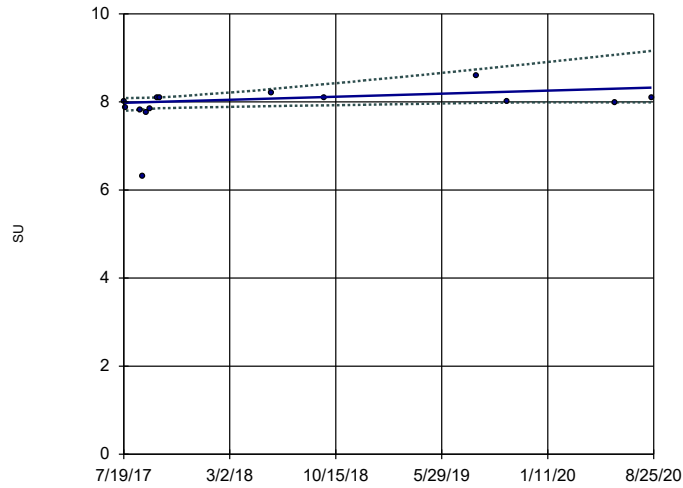


n = 14
 Slope = -0.0547
 units per year.
 Mann-Kendall
 statistic = -36
 critical = -44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

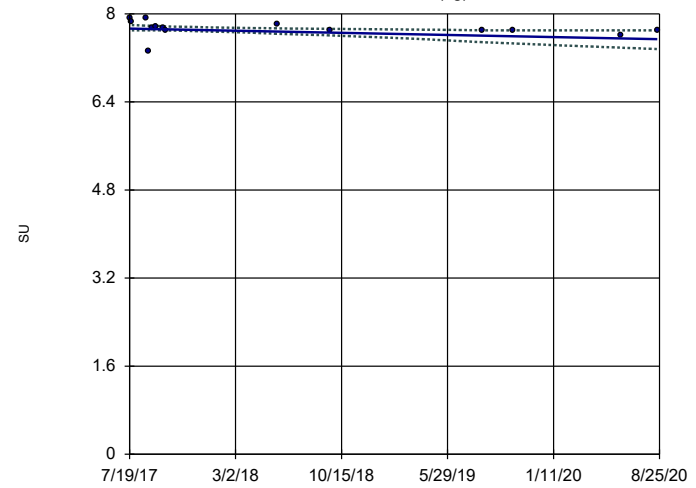


n = 14
 Slope = 0.1116 units per year.
 Mann-Kendall statistic = 35
 critical = 44
 Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

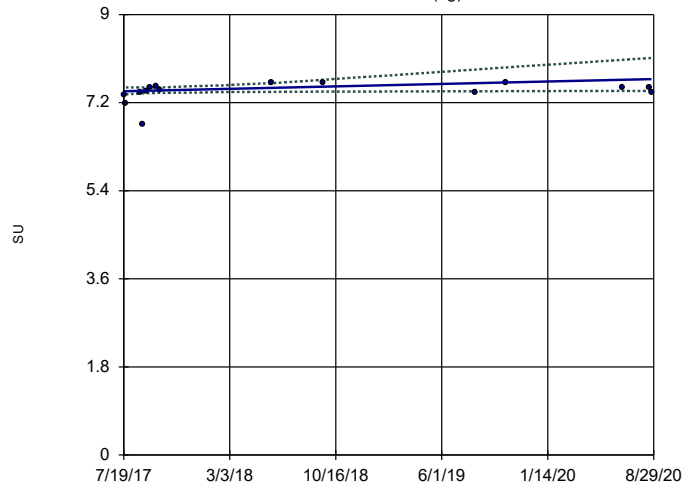


n = 14
 Slope = -0.06249 units per year.
 Mann-Kendall statistic = -45
 critical = -44
 Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

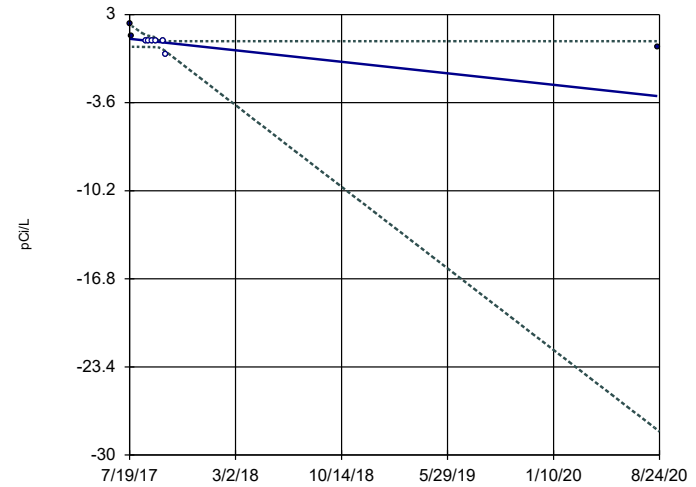


n = 15
 Slope = 0.08058 units per year.
 Mann-Kendall statistic = 37
 critical = 48
 Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: pH [field] Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

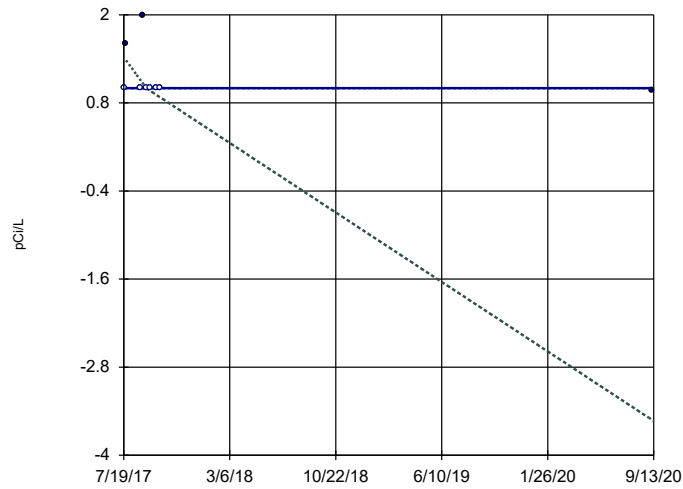


n = 9
 Slope = -1.392 units per year.
 Mann-Kendall statistic = -24
 critical = -23
 Decreasing trend significant at 98% confidence level (α = 0.01 per tail).

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:46 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

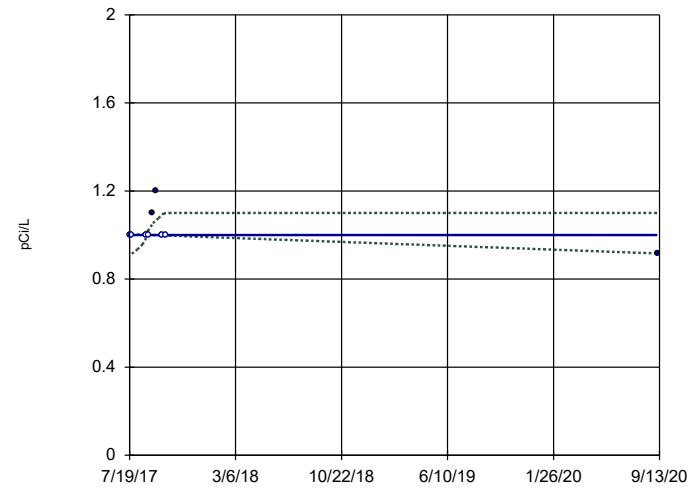


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -13
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

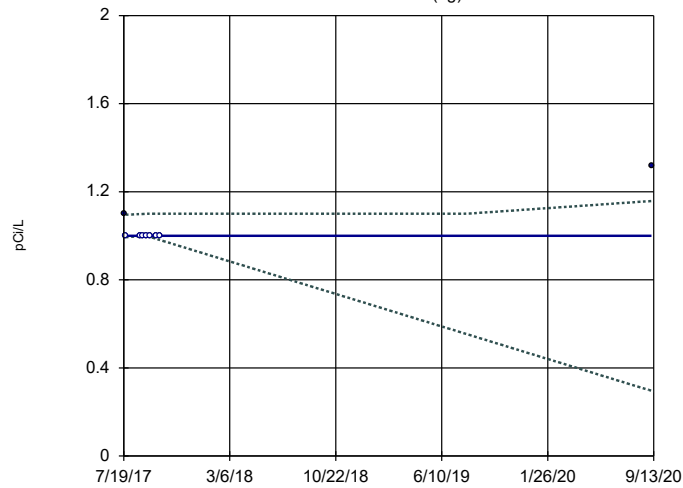


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -3
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

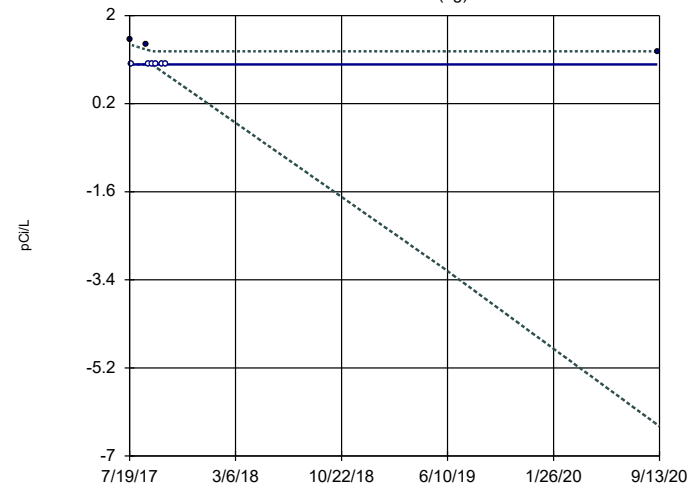


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = 1
critical = 23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

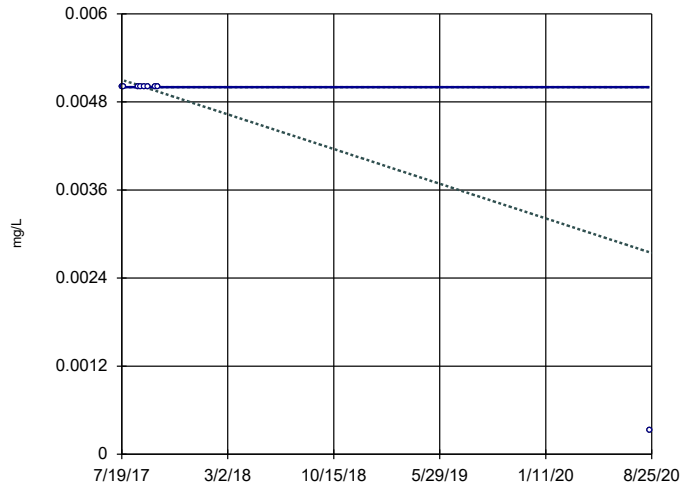


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -7
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

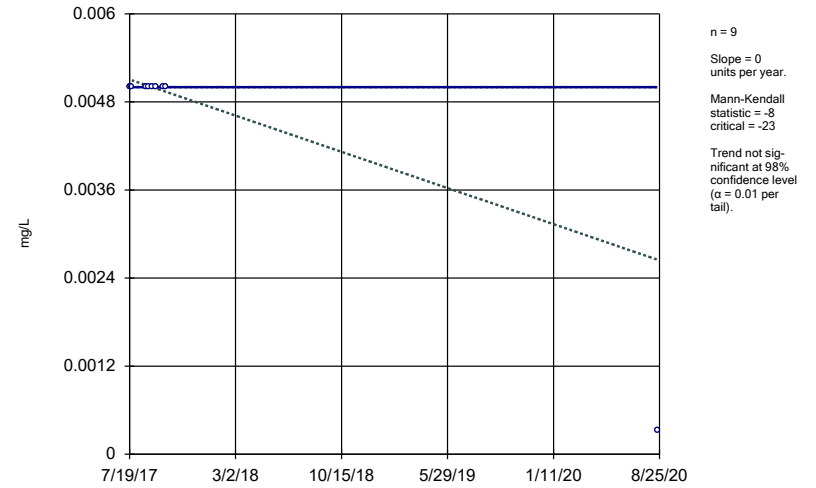
MW-1



Constituent: Selenium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

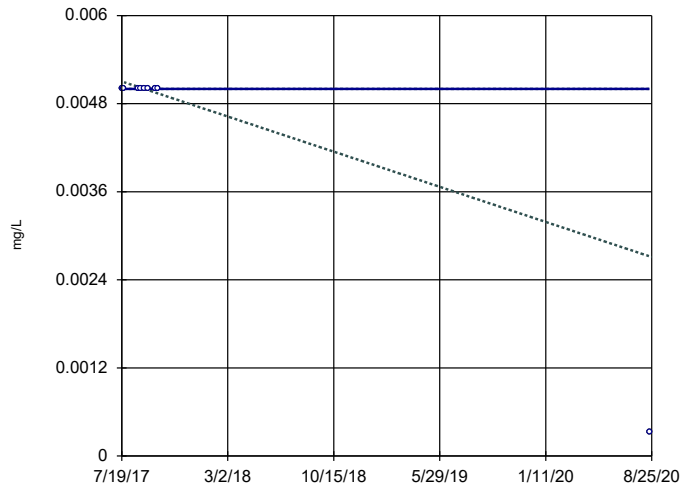
MW-2



Constituent: Selenium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

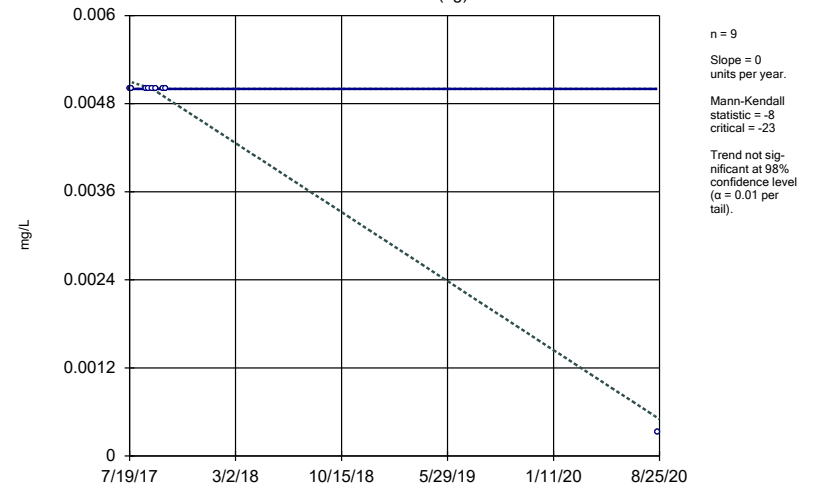
MW-3



Constituent: Selenium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

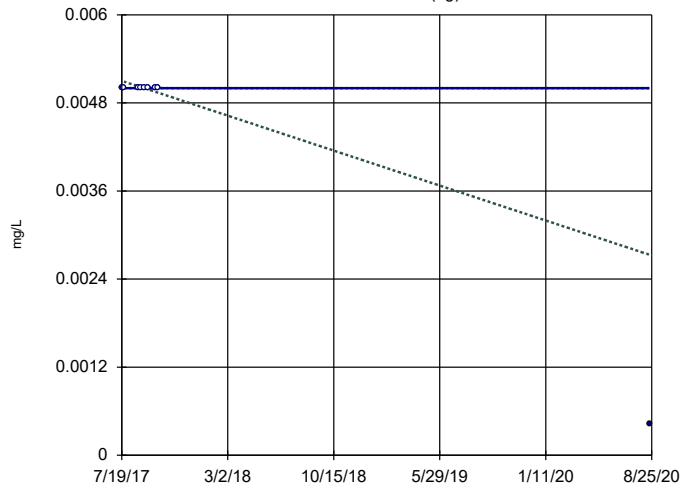
MW-4 (bg)



Constituent: Selenium, Total Analysis Run 11/4/2020 8:46 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

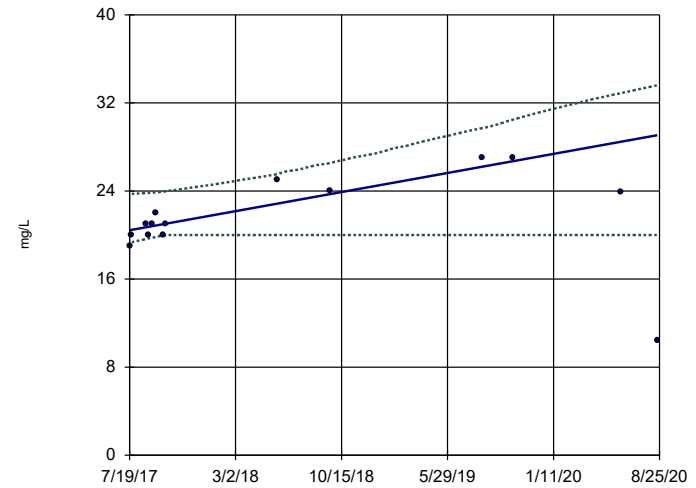


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Selenium, Total Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

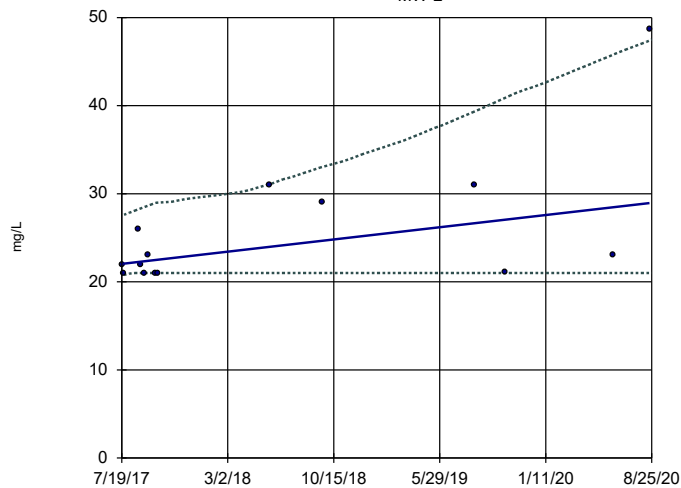


n = 14
Slope = 2.793
units per year.
Mann-Kendall
statistic = 38
critical = 44
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

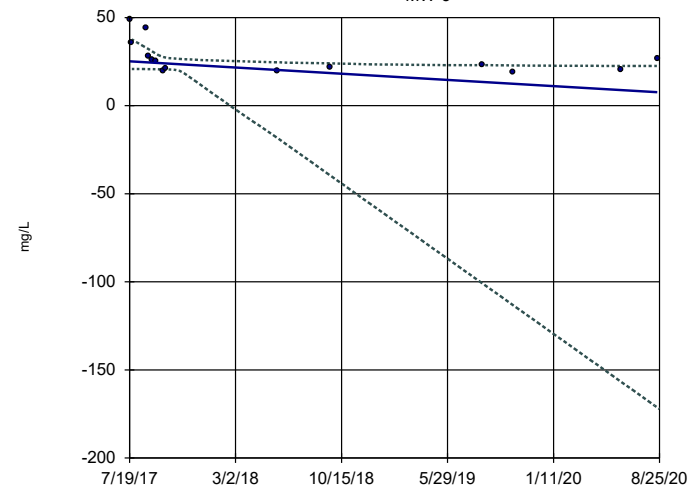


n = 14
Slope = 2.232
units per year.
Mann-Kendall
statistic = 31
critical = 44
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

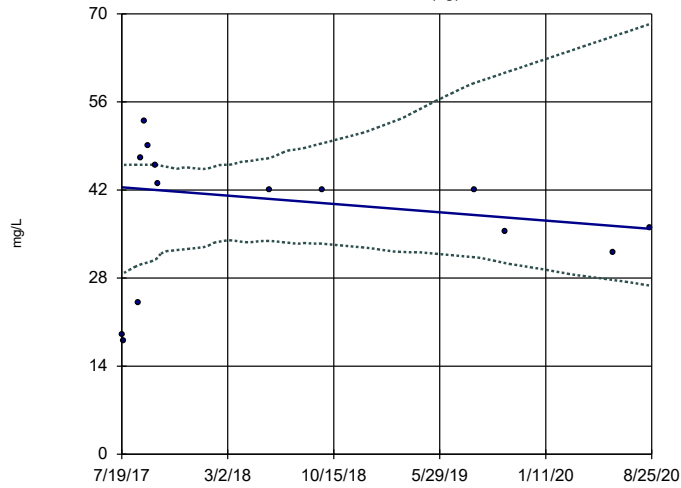


n = 14
Slope = -5.677
units per year.
Mann-Kendall
statistic = -48
critical = -44
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

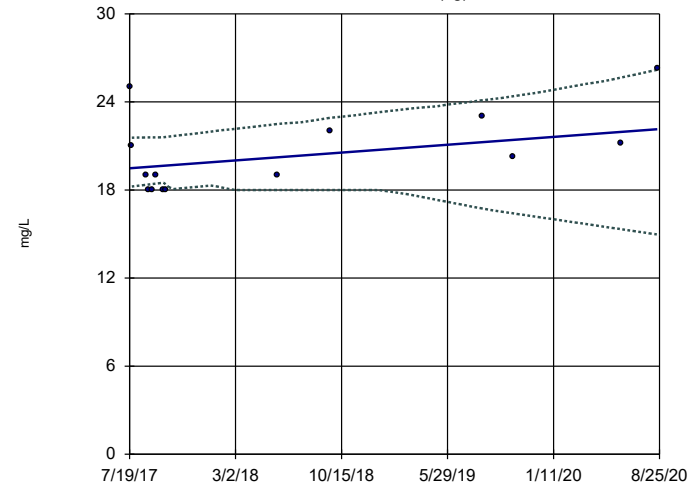


n = 14
 Slope = -2.135
 units per year.
 Mann-Kendall
 statistic = -10
 critical = -44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

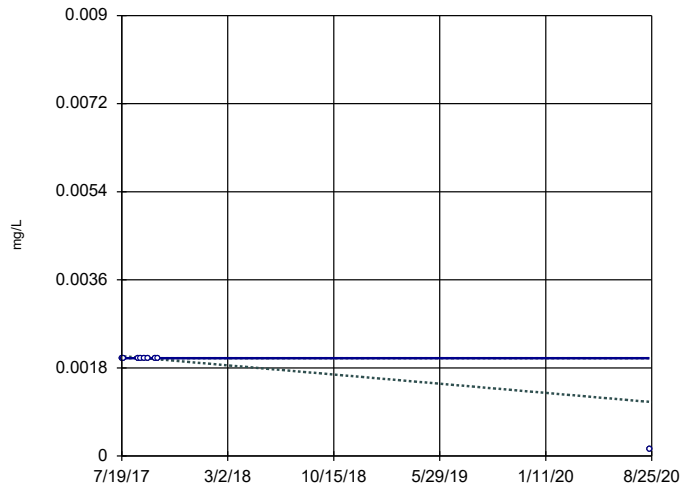


n = 14
 Slope = 0.8629
 units per year.
 Mann-Kendall
 statistic = 22
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Sulfate Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

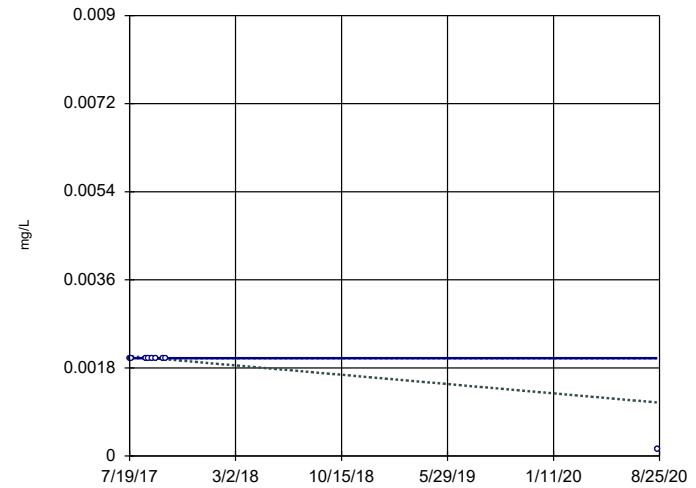


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Thallium, Total Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

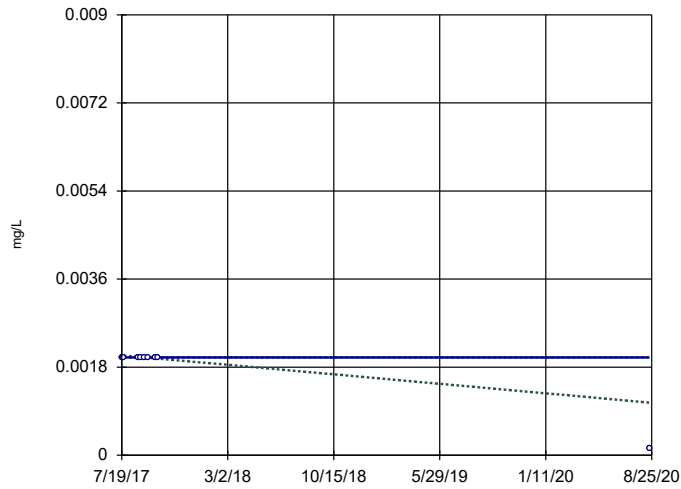


n = 9
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = -8
 critical = -23
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Thallium, Total Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

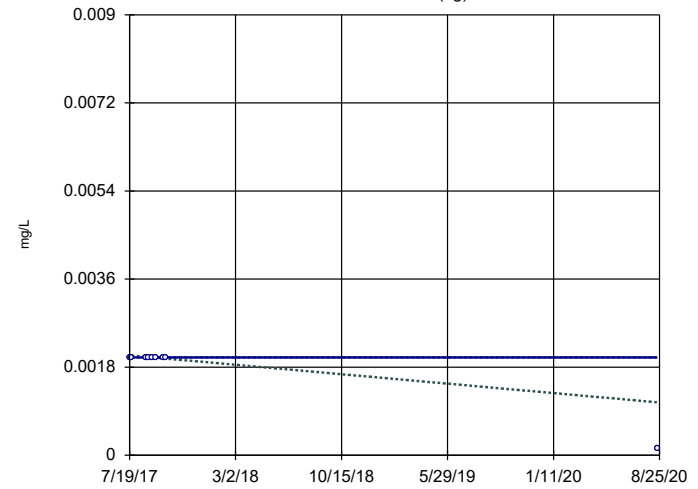


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Thallium, Total Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

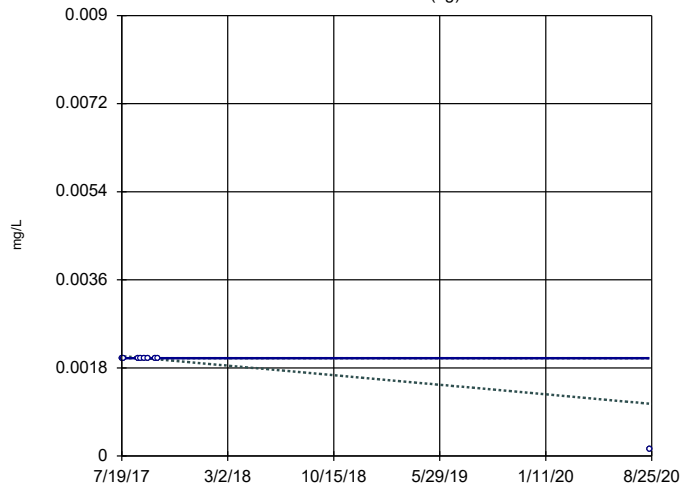


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Thallium, Total Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)

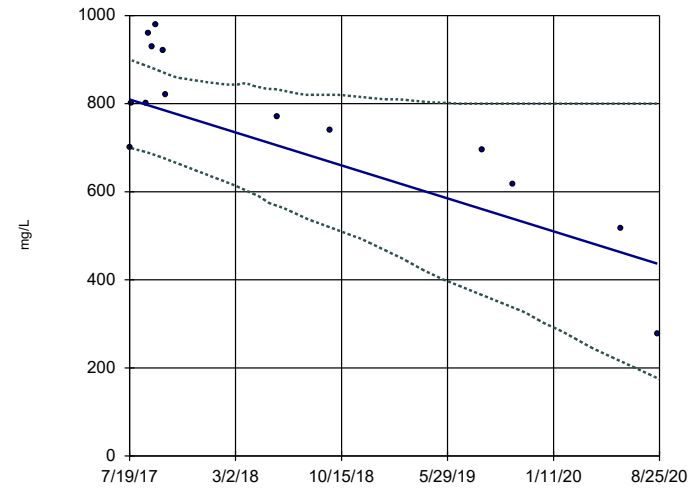


n = 9
Slope = 0
units per year.
Mann-Kendall
statistic = -8
critical = -23
Trend not sig-
nificant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Thallium, Total Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-1

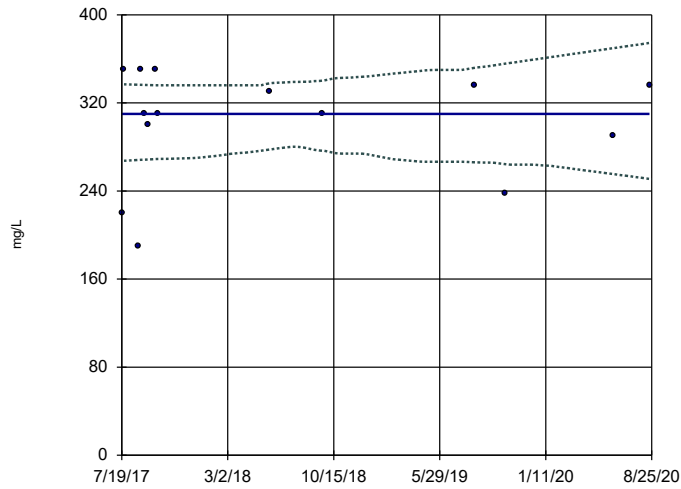


n = 14
Slope = -120.6
units per year.
Mann-Kendall
statistic = -48
critical = -44
Decreasing trend
significant at 98%
confidence level
($\alpha = 0.01$ per
tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:47 AM
Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-2

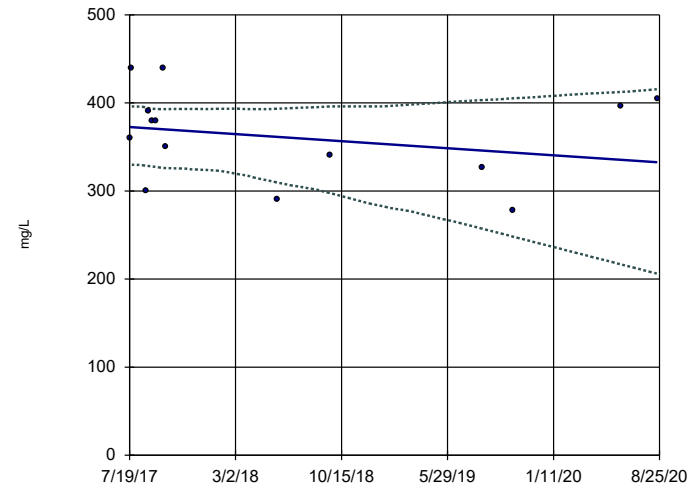


n = 14
 Slope = 0
 units per year.
 Mann-Kendall
 statistic = 2
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-3

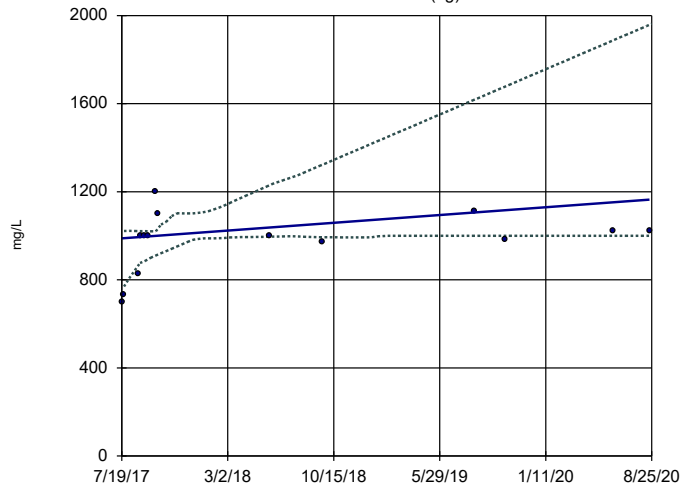


n = 14
 Slope = -12.94
 units per year.
 Mann-Kendall
 statistic = -13
 critical = -44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-4 (bg)

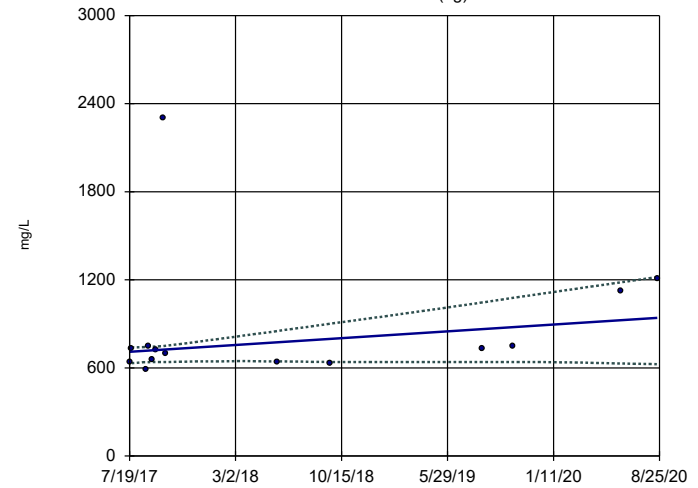


n = 14
 Slope = 56.87
 units per year.
 Mann-Kendall
 statistic = 38
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Sen's Slope and 95% Confidence Band

MW-5 (bg)



n = 14
 Slope = 74.83
 units per year.
 Mann-Kendall
 statistic = 29
 critical = 44
 Trend not sig-
 nificant at 98%
 confidence level
 ($\alpha = 0.01$ per
 tail).

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:47 AM
 Client: GEI Data: Shiras Database

Confidence Interval

Client: GEI Data: Shiras Database Printed 11/5/2020, 12:29 PM

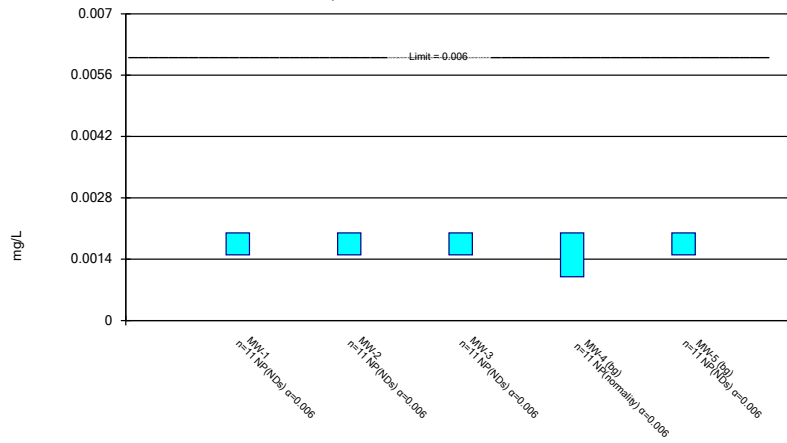
<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Antimony (mg/L)	MW-1	0.002	0.0015	0.006	No	11	100	No	0.006	NP (NDs)
Antimony (mg/L)	MW-2	0.002	0.0015	0.006	No	11	100	No	0.006	NP (NDs)
Antimony (mg/L)	MW-3	0.002	0.0015	0.006	No	11	100	No	0.006	NP (NDs)
Antimony (mg/L)	MW-4 (bg)	0.002	0.001	0.006	No	11	72.73	No	0.006	NP (normality)
Antimony (mg/L)	MW-5 (bg)	0.002	0.0015	0.006	No	11	100	No	0.006	NP (NDs)
Arsenic, Total (mg/L)	MW-1	0.005	0.00085	0.01	No	9	88.89	No	0.002	NP (NDs)
Arsenic, Total (mg/L)	MW-2	0.005	0.00125	0.01	No	9	88.89	No	0.002	NP (NDs)
Arsenic, Total (mg/L)	MW-3	0.005	0.0009167	0.01	No	9	88.89	No	0.002	NP (NDs)
Arsenic, Total (mg/L)	MW-4 (bg)	0.005	0.001603	0.01	No	9	88.89	No	0.002	NP (NDs)
Arsenic, Total (mg/L)	MW-5 (bg)	0.005	0.0005033	0.01	No	9	88.89	No	0.002	NP (NDs)
Barium, Total (mg/L)	MW-1	0.21	0.06	2	No	9	0	No	0.002	NP (normality)
Barium, Total (mg/L)	MW-2	0.1	0.075	2	No	9	88.89	No	0.002	NP (NDs)
Barium, Total (mg/L)	MW-3	0.23	0.1	2	No	9	77.78	No	0.002	NP (NDs)
Barium, Total (mg/L)	MW-4 (bg)	0.11	0.1	2	No	9	88.89	No	0.002	NP (NDs)
Barium, Total (mg/L)	MW-5 (bg)	0.1443	0.1046	2	No	9	11.11	ln(x)	0.01	Param.
Beryllium, Total (mg/L)	MW-1	0.001	0.00025	0.004	No	9	100	No	0.002	NP (NDs)
Beryllium, Total (mg/L)	MW-2	0.001	0.00025	0.004	No	9	100	No	0.002	NP (NDs)
Beryllium, Total (mg/L)	MW-3	0.001	0.00025	0.004	No	9	100	No	0.002	NP (NDs)
Beryllium, Total (mg/L)	MW-4 (bg)	0.001	0.00025	0.004	No	9	100	No	0.002	NP (NDs)
Beryllium, Total (mg/L)	MW-5 (bg)	0.001	0.00025	0.004	No	9	100	No	0.002	NP (NDs)
Cadmium, Total (mg/L)	MW-1	0.001	0.00015	0.005	No	9	100	No	0.002	NP (NDs)
Cadmium, Total (mg/L)	MW-2	0.001	0.00015	0.005	No	9	100	No	0.002	NP (NDs)
Cadmium, Total (mg/L)	MW-3	0.001	0.00015	0.005	No	9	100	No	0.002	NP (NDs)
Cadmium, Total (mg/L)	MW-4 (bg)	0.001	0.00015	0.005	No	9	100	No	0.002	NP (NDs)
Cadmium, Total (mg/L)	MW-5 (bg)	0.001	0.00015	0.005	No	9	100	No	0.002	NP (NDs)
Chromium, Total (mg/L)	MW-1	0.018	0.001	0.1	No	9	88.89	No	0.002	NP (NDs)
Chromium, Total (mg/L)	MW-2	0.01	0.001	0.1	No	9	100	No	0.002	NP (NDs)
Chromium, Total (mg/L)	MW-3	0.01	0.001	0.1	No	9	100	No	0.002	NP (NDs)
Chromium, Total (mg/L)	MW-4 (bg)	0.01	0.001	0.1	No	9	100	No	0.002	NP (NDs)
Chromium, Total (mg/L)	MW-5 (bg)	0.01	0.0012	0.1	No	9	88.89	No	0.002	NP (NDs)
Cobalt, Total (mg/L)	MW-1	0.02	0.00012	0.006	No	9	100	No	0.002	NP (NDs)
Cobalt, Total (mg/L)	MW-2	0.02	0.00012	0.006	No	9	100	No	0.002	NP (NDs)
Cobalt, Total (mg/L)	MW-3	0.02	0.00012	0.006	No	9	100	No	0.002	NP (NDs)
Cobalt, Total (mg/L)	MW-4 (bg)	0.02	0.00014	0.006	No	9	88.89	No	0.002	NP (NDs)
Cobalt, Total (mg/L)	MW-5 (bg)	0.02	0.00012	0.006	No	9	100	No	0.002	NP (NDs)
Fluoride (mg/L)	MW-1	0.1	0.046	4	No	14	85.71	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-2	0.11	0.058	4	No	14	78.57	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-3	0.1	0.067	4	No	14	85.71	No	0.01	NP (NDs)
Fluoride (mg/L)	MW-4 (bg)	0.23	0.1	4	No	14	57.14	No	0.01	NP (normality)
Fluoride (mg/L)	MW-5 (bg)	0.1	0.043	4	No	14	85.71	No	0.01	NP (NDs)
Lead, Total (mg/L)	MW-1	0.017	0.00024	0.015	No	9	88.89	No	0.002	NP (NDs)
Lead, Total (mg/L)	MW-2	0.24	0.00024	0.015	No	9	88.89	No	0.002	NP (NDs)
Lead, Total (mg/L)	MW-3	0.003	0.00024	0.015	No	9	100	No	0.002	NP (NDs)
Lead, Total (mg/L)	MW-4 (bg)	0.0031	0.00033	0.015	No	9	77.78	No	0.002	NP (NDs)
Lead, Total (mg/L)	MW-5 (bg)	0.003	0.00024	0.015	No	9	100	No	0.002	NP (NDs)
Lithium, Total (mg/L)	MW-1	0.01	0.008	0.04	No	9	88.89	No	0.002	NP (NDs)
Lithium, Total (mg/L)	MW-2	0.01	0.0064	0.04	No	9	88.89	No	0.002	NP (NDs)
Lithium, Total (mg/L)	MW-3	0.01	0.0076	0.04	No	9	88.89	No	0.002	NP (NDs)
Lithium, Total (mg/L)	MW-4 (bg)	0.013	0.0095	0.04	No	9	66.67	No	0.002	NP (normality)
Lithium, Total (mg/L)	MW-5 (bg)	0.013	0.01	0.04	No	9	77.78	No	0.002	NP (NDs)

Confidence Interval

Client: GEI Data: Shiras Database Printed 11/5/2020, 12:29 PM

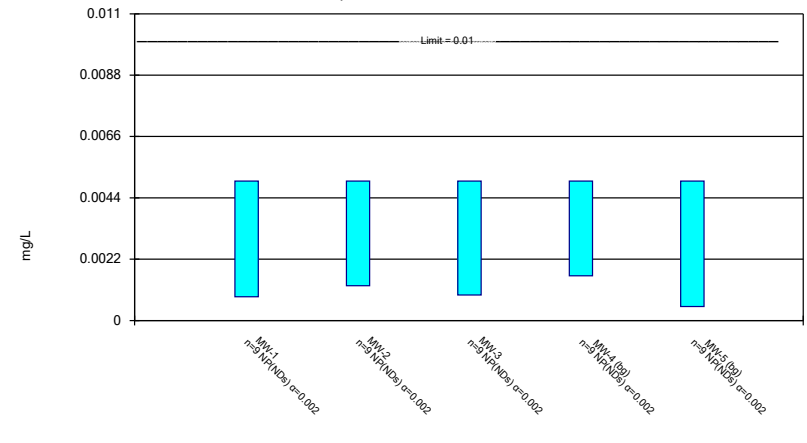
<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Mercury, Total (mg/L)	MW-1	0.0002	0.000066	0.002	No	9	100	No	0.002	NP (NDs)
Mercury, Total (mg/L)	MW-2	0.0002	0.000066	0.002	No	9	100	No	0.002	NP (NDs)
Mercury, Total (mg/L)	MW-3	0.0002	0.000066	0.002	No	9	100	No	0.002	NP (NDs)
Mercury, Total (mg/L)	MW-4 (bg)	0.0002	0.000066	0.002	No	9	100	No	0.002	NP (NDs)
Mercury, Total (mg/L)	MW-5 (bg)	0.0002	0.000066	0.002	No	9	100	No	0.002	NP (NDs)
Molybdenum, Total (mg/L)	MW-1	0.05	0.00092	0.1	No	9	88.89	No	0.002	NP (NDs)
Molybdenum, Total (mg/L)	MW-2	0.05	0.0033	0.1	No	9	88.89	No	0.002	NP (NDs)
Molybdenum, Total (mg/L)	MW-3	0.05	0.0011	0.1	No	9	88.89	No	0.002	NP (NDs)
Molybdenum, Total (mg/L)	MW-4 (bg)	0.05	0.013	0.1	No	9	88.89	No	0.002	NP (NDs)
Molybdenum, Total (mg/L)	MW-5 (bg)	0.05	0.0014	0.1	No	9	88.89	No	0.002	NP (NDs)
Radium 224 and 226 (pCi/L)	MW-1	1.635	0.4317	5	No	9	66.67	No	0.01	Param.
Radium 224 and 226 (pCi/L)	MW-2	2	0.978	5	No	9	66.67	No	0.002	NP (normality)
Radium 224 and 226 (pCi/L)	MW-3	1.2	0.917	5	No	9	66.67	No	0.002	NP (normality)
Radium 224 and 226 (pCi/L)	MW-4 (bg)	1.32	1	5	No	9	77.78	No	0.002	NP (NDs)
Radium 224 and 226 (pCi/L)	MW-5 (bg)	1.5	1	5	No	9	66.67	No	0.002	NP (normality)
Selenium, Total (mg/L)	MW-1	0.005	0.00032	0.05	No	9	100	No	0.002	NP (NDs)
Selenium, Total (mg/L)	MW-2	0.005	0.00032	0.05	No	9	100	No	0.002	NP (NDs)
Selenium, Total (mg/L)	MW-3	0.005	0.00032	0.05	No	9	100	No	0.002	NP (NDs)
Selenium, Total (mg/L)	MW-4 (bg)	0.005	0.00032	0.05	No	9	100	No	0.002	NP (NDs)
Selenium, Total (mg/L)	MW-5 (bg)	0.005	0.00043	0.05	No	9	88.89	No	0.002	NP (NDs)
Thallium, Total (mg/L)	MW-1	0.002	0.00014	0.002	No	9	100	No	0.002	NP (NDs)
Thallium, Total (mg/L)	MW-2	0.002	0.00014	0.002	No	9	100	No	0.002	NP (NDs)
Thallium, Total (mg/L)	MW-3	0.002	0.00014	0.002	No	9	100	No	0.002	NP (NDs)
Thallium, Total (mg/L)	MW-4 (bg)	0.002	0.00014	0.002	No	9	100	No	0.002	NP (NDs)
Thallium, Total (mg/L)	MW-5 (bg)	0.002	0.00014	0.002	No	9	100	No	0.002	NP (NDs)

Non-Parametric Confidence Interval
Compliance Limit is not exceeded.



Constituent: Antimony Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

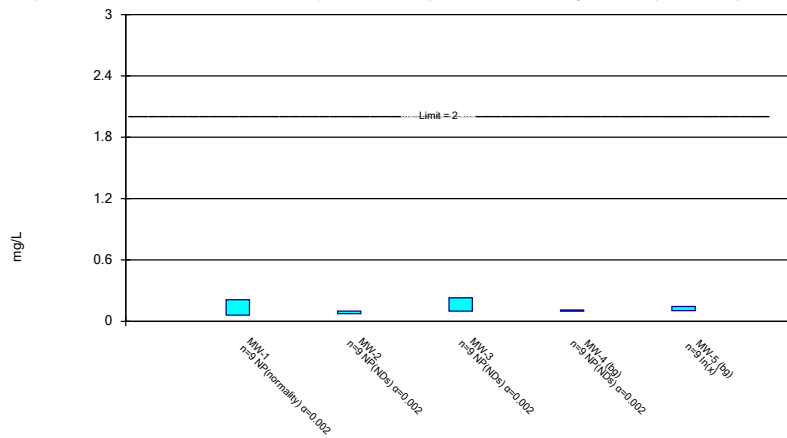
Non-Parametric Confidence Interval
Compliance Limit is not exceeded.



Constituent: Arsenic, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Parametric and Non-Parametric (NP) Confidence Interval

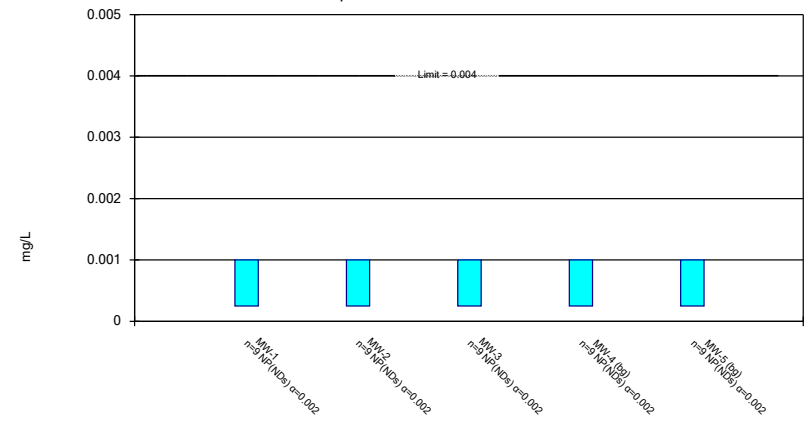
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Barium, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

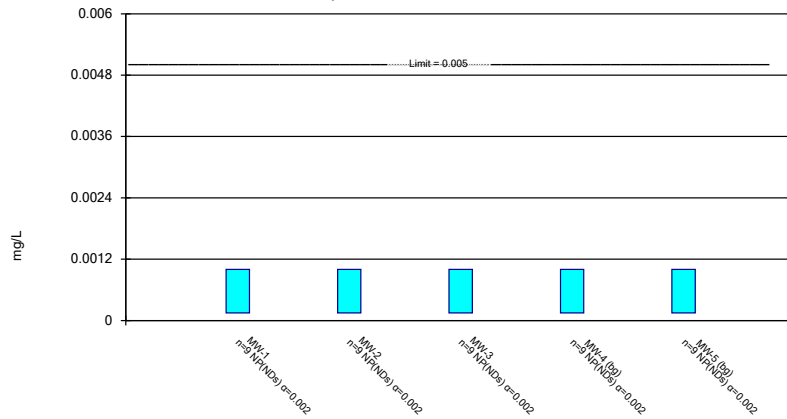
Compliance Limit is not exceeded.



Constituent: Beryllium, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

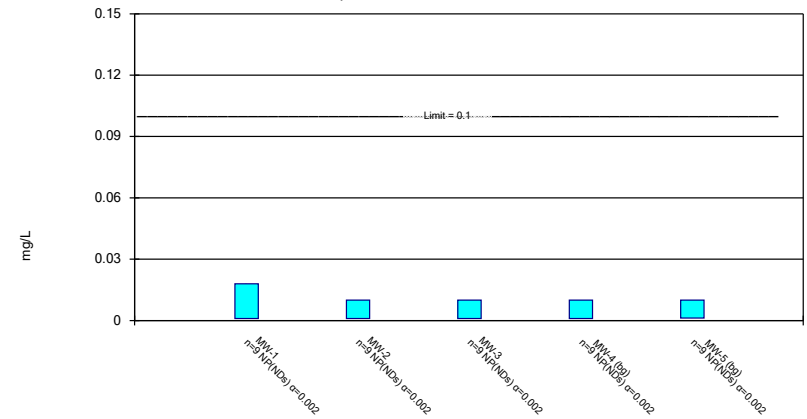
Compliance Limit is not exceeded.



Constituent: Cadmium, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

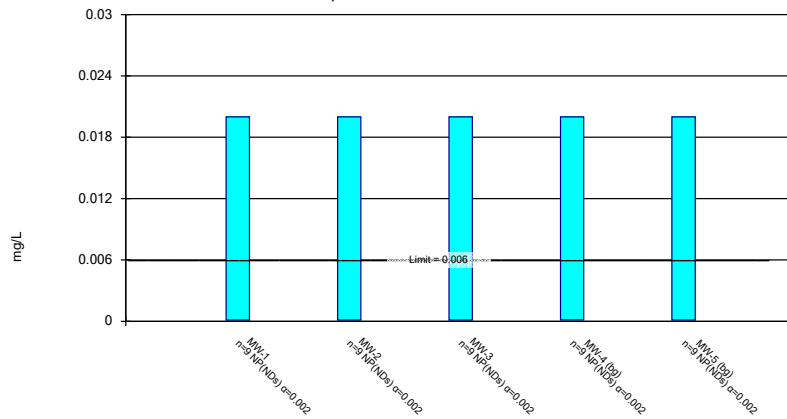
Compliance Limit is not exceeded.



Constituent: Chromium, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

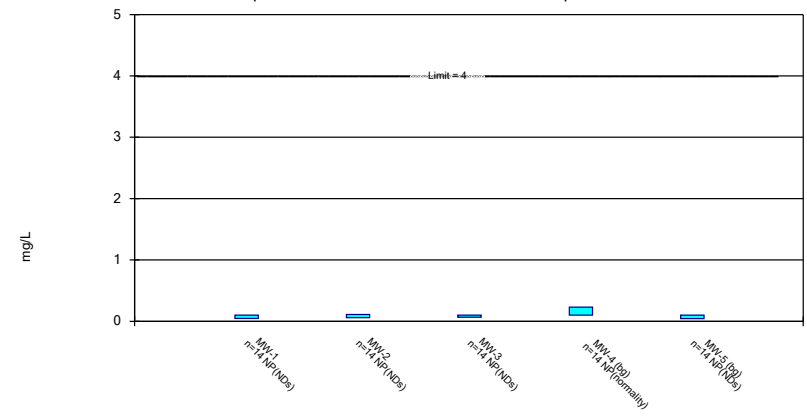
Compliance Limit is not exceeded.



Constituent: Cobalt, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

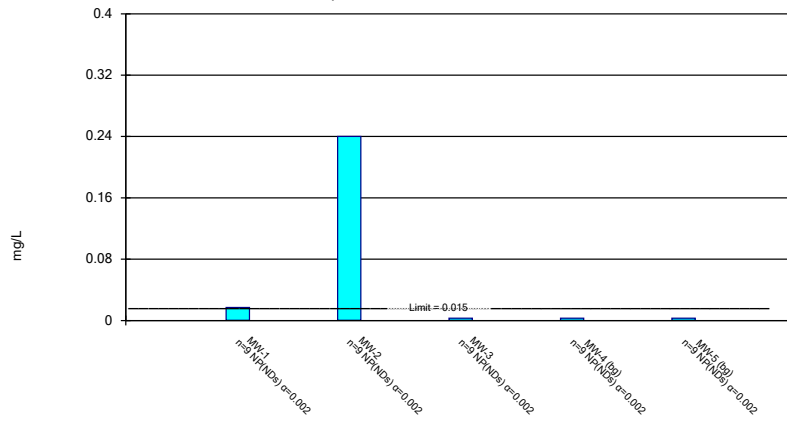
Compliance Limit is not exceeded. Per-well alpha = 0.01.



Constituent: Fluoride Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

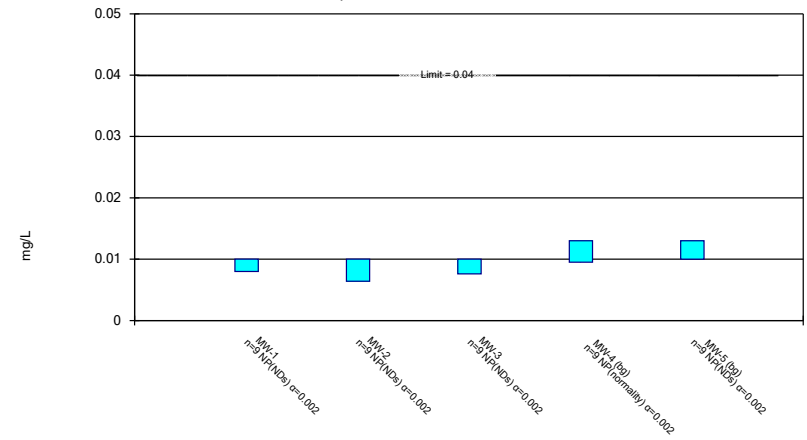
Compliance Limit is not exceeded.



Constituent: Lead, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

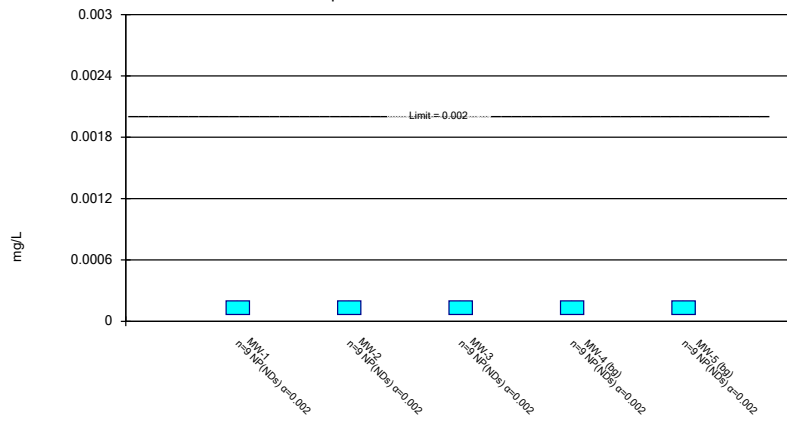
Compliance Limit is not exceeded.



Constituent: Lithium, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

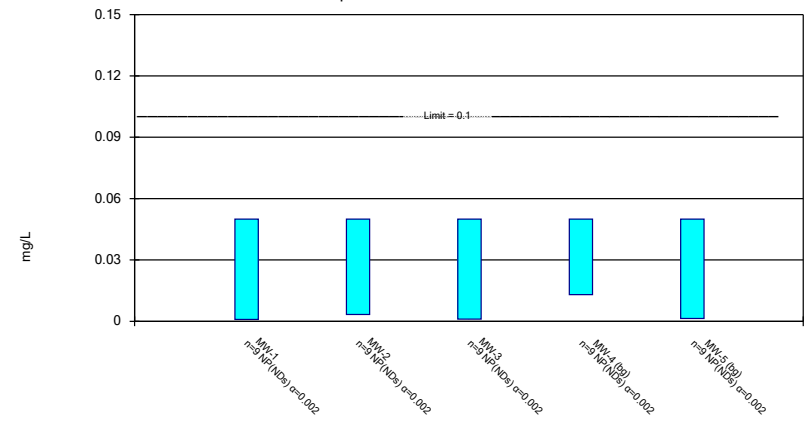
Compliance Limit is not exceeded.



Constituent: Mercury, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

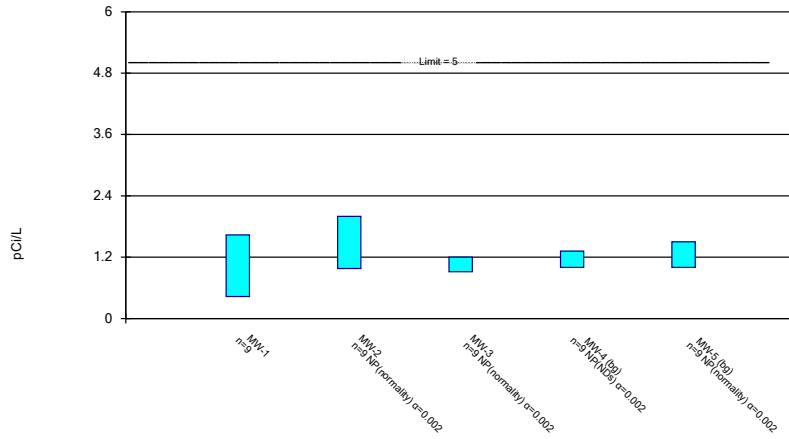
Compliance Limit is not exceeded.



Constituent: Molybdenum, Total Analysis Run 11/5/2020 12:28 PM
Client: GEI Data: Shiras Database

Parametric and Non-Parametric (NP) Confidence Interval

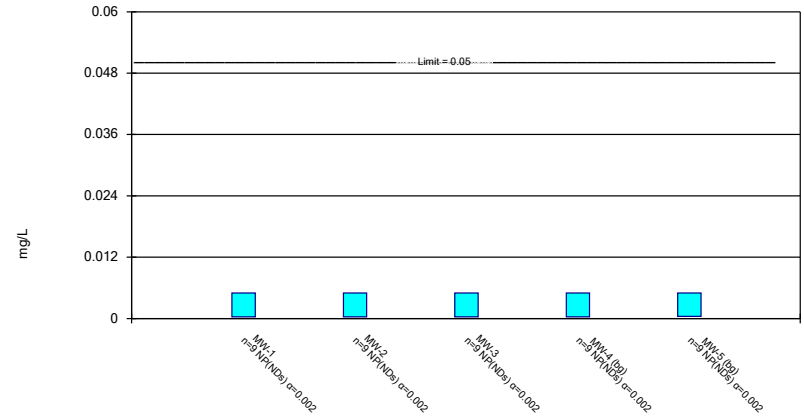
Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Radium 224 and 226 Analysis Run 11/5/2020 12:29 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

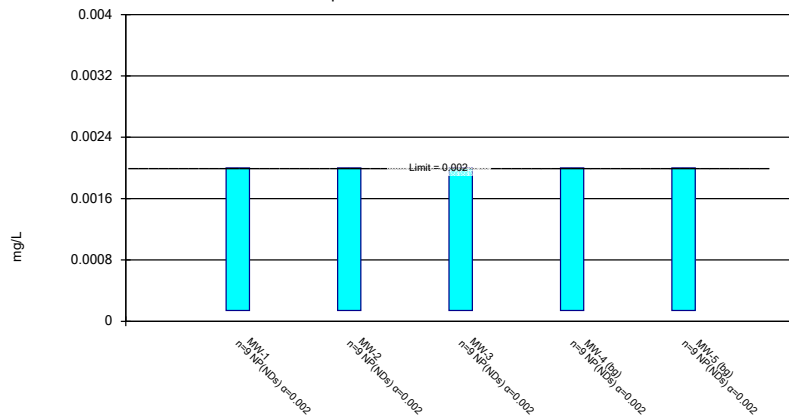
Compliance Limit is not exceeded.



Constituent: Selenium, Total Analysis Run 11/5/2020 12:29 PM
Client: GEI Data: Shiras Database

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Thallium, Total Analysis Run 11/5/2020 12:29 PM
Client: GEI Data: Shiras Database

Outlier Analysis

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:45 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	N	Mean	Std. Dev.	Distrib...	Normality Test
Arsenic, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.004539	0.001383	unknown	ShapiroWilk
Arsenic, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.004583	0.00125	unknown	ShapiroWilk
Arsenic, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.004546	0.001361	unknown	ShapiroWilk
Arsenic, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.004623	0.001132	unknown	ShapiroWilk
Arsenic, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.0045	0.001499	unknown	ShapiroWilk
Barium, Total (mg/L)	MW-1	Yes	0.21,0.06	7/19/2017,8/20/2020	NP (nrm)	9	0.1344	0.03812	unknown	ShapiroWilk
Barium, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.09722	0.008333	unknown	ShapiroWilk
Barium, Total (mg/L)	MW-3	Yes	0.23	7/24/2017	NP (nrm)	9	0.1167	0.04301	unknown	ShapiroWilk
Barium, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.1011	0.003333	unknown	ShapiroWilk
Barium, Total (mg/L)	MW-5 (bg)	No	n/a	n/a	EPA 1989	9	0.1244	0.02186	ln(x)	ShapiroWilk
Beryllium, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.00025	unknown	ShapiroWilk
Beryllium, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.00025	unknown	ShapiroWilk
Beryllium, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.00025	unknown	ShapiroWilk
Beryllium, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.00025	unknown	ShapiroWilk
Beryllium, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.00025	unknown	ShapiroWilk
Boron (mg/L)	MW-1	No	n/a	n/a	NP (nrm)	14	0.2151	0.1493	unknown	ShapiroWilk
Boron (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	14	0.2024	0.1189	unknown	ShapiroWilk
Boron (mg/L)	MW-3	No	n/a	n/a	NP (nrm)	14	0.1894	0.1326	unknown	ShapiroWilk
Boron (mg/L)	MW-4 (bg)	No	n/a	n/a	NP (nrm)	14	0.2152	0.102	unknown	ShapiroWilk
Boron (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	14	0.1884	0.1339	unknown	ShapiroWilk
Cadmium, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0002833	unknown	ShapiroWilk
Cadmium, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0002833	unknown	ShapiroWilk
Cadmium, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0002833	unknown	ShapiroWilk
Cadmium, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0002833	unknown	ShapiroWilk
Cadmium, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0002833	unknown	ShapiroWilk
Calcium (mg/L)	MW-1	Yes	37	8/20/2020	Dixon`s	14	108.5	24.15	normal	ShapiroWilk
Calcium (mg/L)	MW-2	No	n/a	n/a	EPA 1989	14	57.39	5.549	normal	ShapiroWilk
Calcium (mg/L)	MW-3	No	n/a	n/a	EPA 1989	14	66.33	5.704	normal	ShapiroWilk
Calcium (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA 1989	14	116.4	18.34	normal	ShapiroWilk
Calcium (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	14	118.9	21.93	unknown	ShapiroWilk
Chloride (mg/L)	MW-1	Yes	86.7	8/20/2020	Dixon`s	14	253.8	53.79	normal	ShapiroWilk
Chloride (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	14	67.1	10.49	unknown	ShapiroWilk
Chloride (mg/L)	MW-3	No	n/a	n/a	Dixon`s	14	89.74	10.12	normal	ShapiroWilk
Chloride (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA 1989	14	370.2	73.29	normal	ShapiroWilk
Chloride (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	14	232.5	62.55	unknown	ShapiroWilk
Chromium, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.009889	0.004256	unknown	ShapiroWilk
Chromium, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.009	0.003	unknown	ShapiroWilk
Chromium, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.009	0.003	unknown	ShapiroWilk
Chromium, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.009	0.003	unknown	ShapiroWilk
Chromium, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.009022	0.002933	unknown	ShapiroWilk
Cobalt, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.01779	0.006627	unknown	ShapiroWilk
Cobalt, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.01779	0.006627	unknown	ShapiroWilk
Cobalt, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.01779	0.006627	unknown	ShapiroWilk
Cobalt, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.01779	0.00662	unknown	ShapiroWilk
Cobalt, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.01779	0.006627	unknown	ShapiroWilk
Fluoride (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	14	0.09143	0.01976	unknown	ShapiroWilk
Fluoride (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	14	0.1217	0.1044	unknown	ShapiroWilk
Fluoride (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	14	0.09371	0.01417	unknown	ShapiroWilk
Fluoride (mg/L)	MW-4 (bg)	No	n/a	n/a	NP (nrm)	14	0.1464	0.0682	unknown	ShapiroWilk
Fluoride (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	14	0.09029	0.02277	unknown	ShapiroWilk

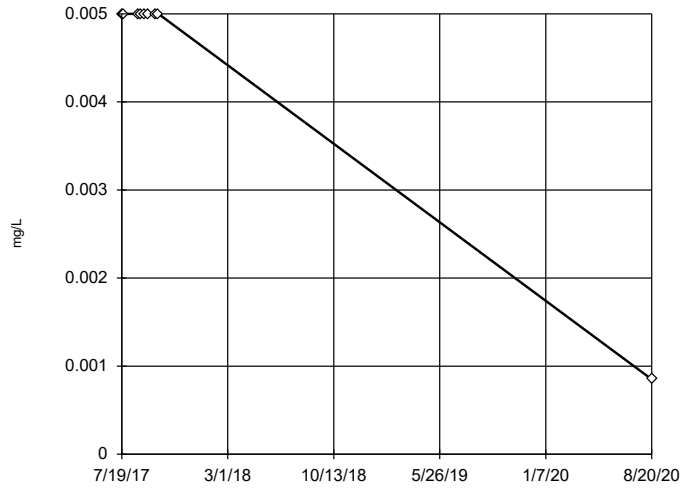
Outlier Analysis

Client: GEI Data: Shiras Database Printed 11/4/2020, 8:45 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	N	Mean	Std. Dev.	Distrib...	Normality Test
Lead, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.004249	0.004868	unknown	ShapiroWilk
Lead, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.02903	0.07912	unknown	ShapiroWilk
Lead, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.002693	0.00092	unknown	ShapiroWilk
Lead, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.002714	0.0008948	unknown	ShapiroWilk
Lead, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.002693	0.00092	unknown	ShapiroWilk
Lithium, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.009778	0.0006667	unknown	ShapiroWilk
Lithium, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.0096	0.0012	unknown	ShapiroWilk
Lithium, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.009733	0.0008	unknown	ShapiroWilk
Lithium, Total (mg/L)	MW-4 (bg)	Yes	0.013	9/28/2017	NP (nrm)	9	0.01039	0.001054	unknown	ShapiroWilk
Lithium, Total (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	9	0.01067	0.001323	unknown	ShapiroWilk
Mercury, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0000...	unknown	ShapiroWilk
Mercury, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0000...	unknown	ShapiroWilk
Mercury, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0000...	unknown	ShapiroWilk
Mercury, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0000...	unknown	ShapiroWilk
Mercury, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.000...	0.0000...	unknown	ShapiroWilk
Molybdenum, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.04455	0.01636	unknown	ShapiroWilk
Molybdenum, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.04481	0.01557	unknown	ShapiroWilk
Molybdenum, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.04457	0.0163	unknown	ShapiroWilk
Molybdenum, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.04589	0.01233	unknown	ShapiroWilk
Molybdenum, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.0446	0.0162	unknown	ShapiroWilk
pH [field] (SU)	MW-1	Yes	6.56	8/29/2017	Dixon's	14	7.617	0.3553	normal	ShapiroWilk
pH [field] (SU)	MW-2	Yes	8.41,7.03	7/19/2017,8/29/2017	Dixon's	14	7.993	0.3023	normal	ShapiroWilk
pH [field] (SU)	MW-3	Yes	8.6,6.32	8/13/2019,8/29/2017	Dixon's	14	7.913	0.5027	normal	ShapiroWilk
pH [field] (SU)	MW-4 (bg)	Yes	7.32	8/29/2017	Dixon's	14	7.728	0.1492	normal	ShapiroWilk
pH [field] (SU)	MW-5 (bg)	Yes	7.17,6.76	7/24/2017,8/29/2017	Dixon's	15	7.417	0.2131	normal	ShapiroWilk
Radium 224 and 226 (pCi/L)	MW-1	No	n/a	n/a	NP (nrm)	9	1.033	0.6229	unknown	ShapiroWilk
Radium 224 and 226 (pCi/L)	MW-2	No	n/a	n/a	NP (nrm)	9	1.175	0.3681	unknown	ShapiroWilk
Radium 224 and 226 (pCi/L)	MW-3	No	n/a	n/a	NP (nrm)	9	1.024	0.08036	unknown	ShapiroWilk
Radium 224 and 226 (pCi/L)	MW-4 (bg)	Yes	1.32	9/8/2020	NP (nrm)	9	1.047	0.1077	unknown	ShapiroWilk
Radium 224 and 226 (pCi/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	9	1.13	0.2033	unknown	ShapiroWilk
Selenium, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.00448	0.00156	unknown	ShapiroWilk
Selenium, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.00448	0.00156	unknown	ShapiroWilk
Selenium, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.00448	0.00156	unknown	ShapiroWilk
Selenium, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.00448	0.00156	unknown	ShapiroWilk
Selenium, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.004492	0.001523	unknown	ShapiroWilk
Sulfate (mg/L)	MW-1	Yes	10.4	8/20/2020	Dixon's	14	21.52	4.132	ln(x)	ShapiroWilk
Sulfate (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	14	25.78	7.58	unknown	ShapiroWilk
Sulfate (mg/L)	MW-3	No	n/a	n/a	NP (nrm)	14	27.2	9.349	unknown	ShapiroWilk
Sulfate (mg/L)	MW-4 (bg)	No	n/a	n/a	EPA 1989	14	37.74	10.98	normal	ShapiroWilk
Sulfate (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	14	20.56	2.701	unknown	ShapiroWilk
Thallium, Total (mg/L)	MW-1	n/a	n/a	n/a	NP (nrm)	9	0.001793	0.00062	unknown	ShapiroWilk
Thallium, Total (mg/L)	MW-2	n/a	n/a	n/a	NP (nrm)	9	0.001793	0.00062	unknown	ShapiroWilk
Thallium, Total (mg/L)	MW-3	n/a	n/a	n/a	NP (nrm)	9	0.001793	0.00062	unknown	ShapiroWilk
Thallium, Total (mg/L)	MW-4 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.001793	0.00062	unknown	ShapiroWilk
Thallium, Total (mg/L)	MW-5 (bg)	n/a	n/a	n/a	NP (nrm)	9	0.001793	0.00062	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-1	No	n/a	n/a	Dixon's	14	751.7	190.3	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-2	No	n/a	n/a	NP (nrm)	14	301.4	50.92	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-3	No	n/a	n/a	EPA 1989	14	362.4	51.54	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-4 (bg)	No	n/a	n/a	NP (nrm)	14	976.1	138.1	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-5 (bg)	No	n/a	n/a	NP (nrm)	14	869.1	449.7	unknown	ShapiroWilk

Tukey's Outlier Screening

MW-1

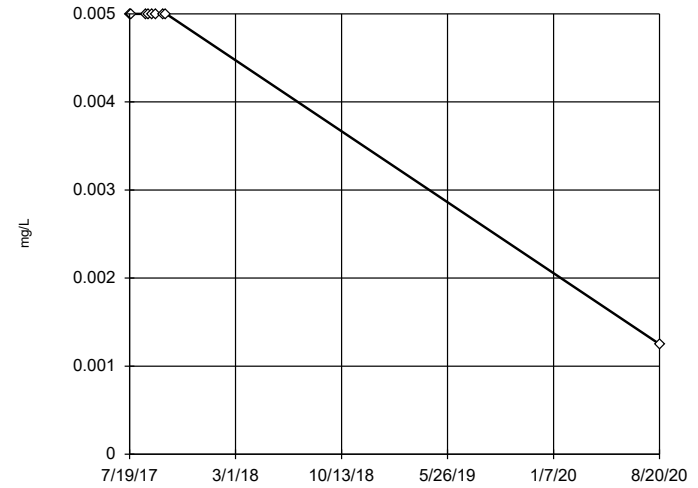


n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

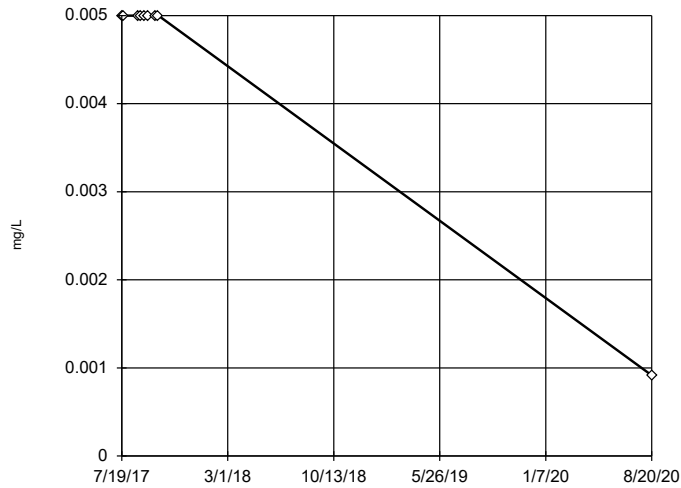


n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-3

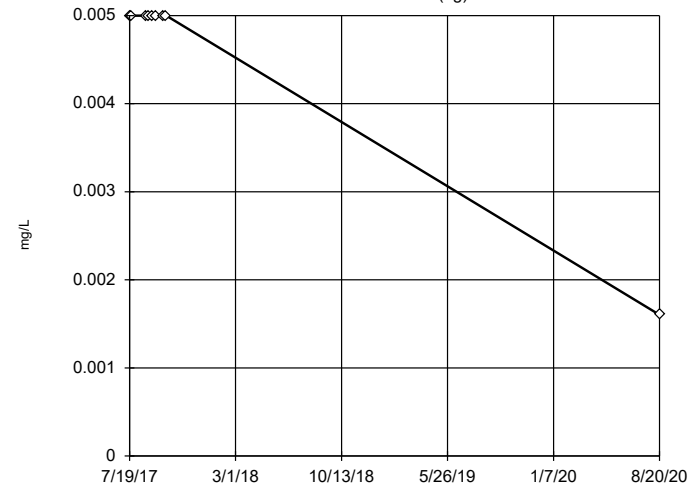


n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x^6 transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

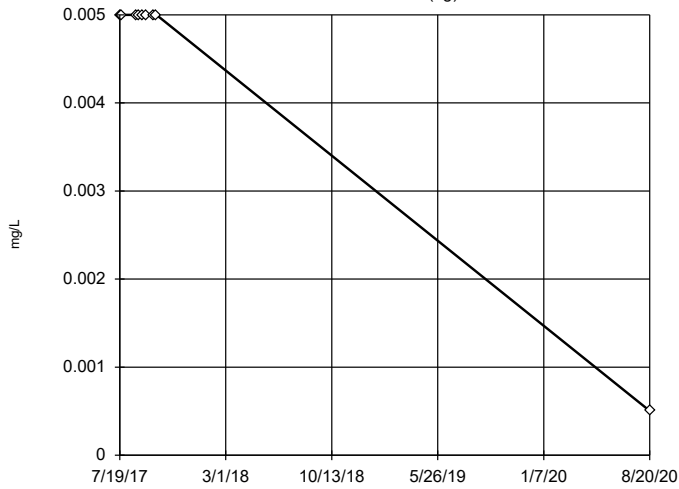
MW-4 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were cube transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

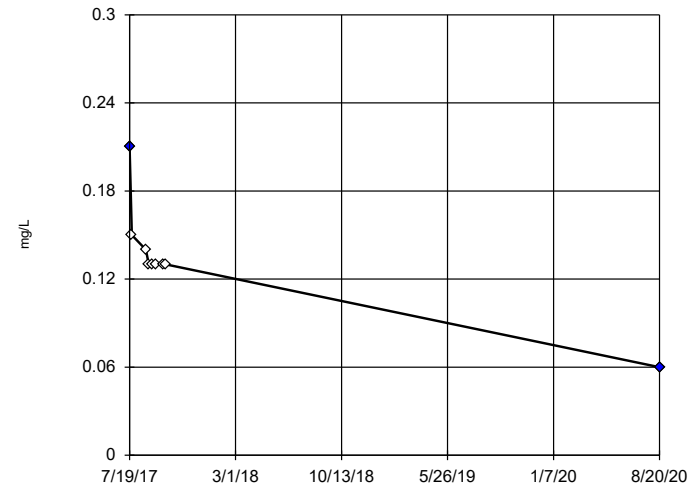
Tukey's Outlier Screening
MW-5 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Arsenic, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

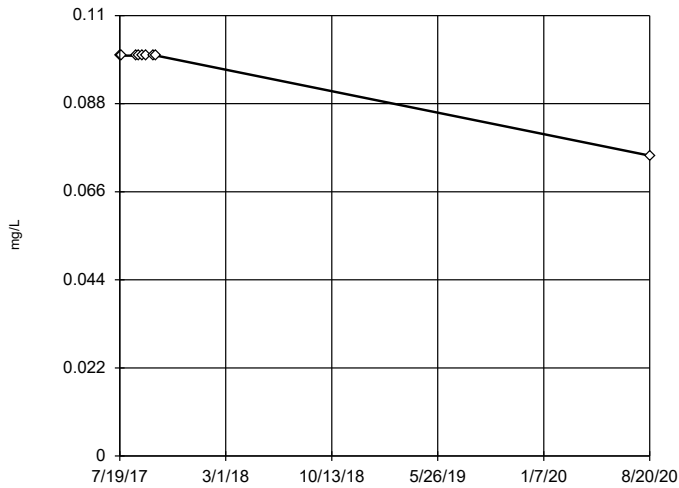
Tukey's Outlier Screening
MW-1



n = 9
Outliers are drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
High cutoff = 0.19, low cutoff = 0.085, based on IQR multiplier of 3.

Constituent: Barium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

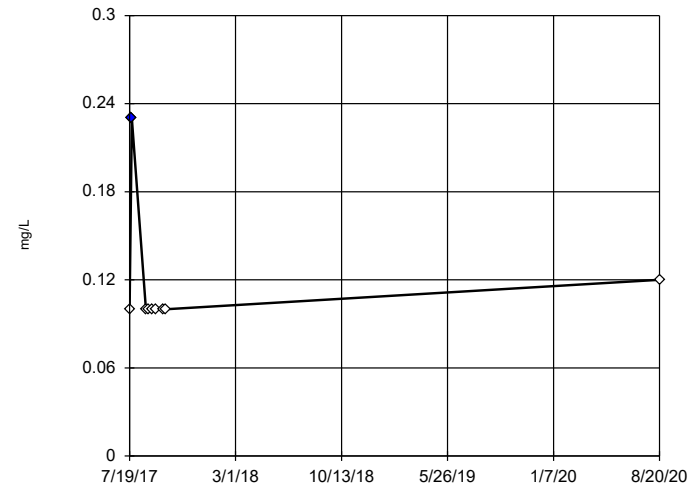
Tukey's Outlier Screening
MW-2



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Barium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

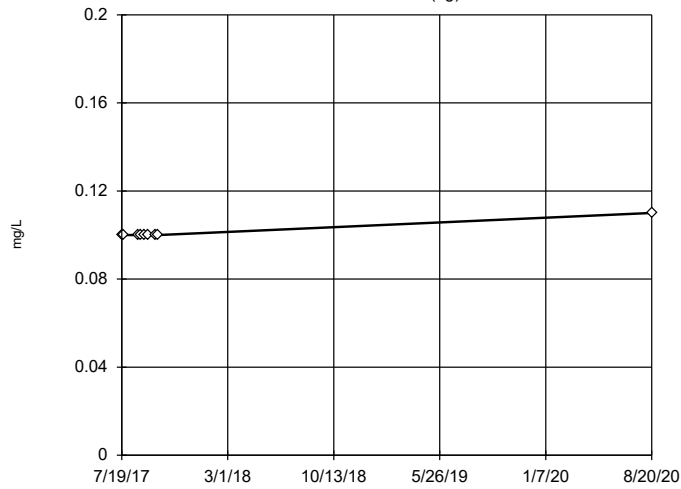
Tukey's Outlier Screening
MW-3



n = 9
Outlier is drawn as solid. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 0.144, low cutoff = 0.07607, based on IQR multiplier of 3.

Constituent: Barium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

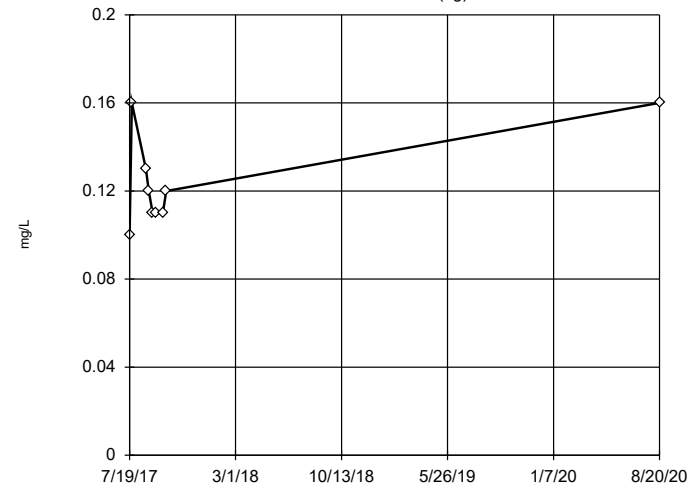
Tukey's Outlier Screening
MW-4 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Barium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

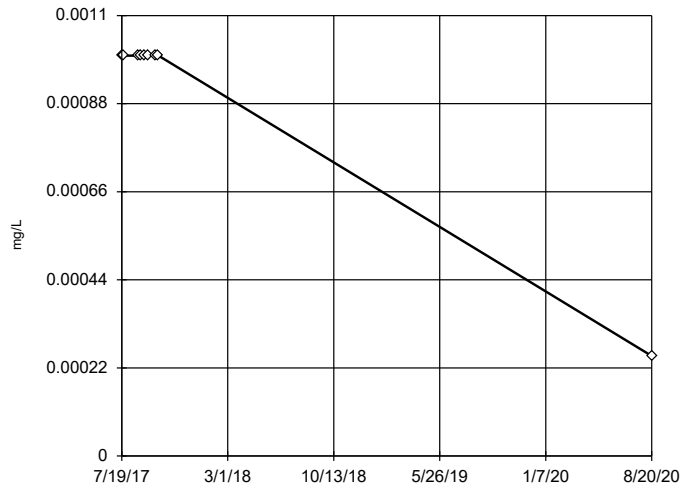
EPA Screening (suspected outliers for Dixon's Test)
MW-5 (bg)



n = 9
Dixon's will not be run. No suspect values identified or unable to establish suspect values.
Mean 0.1244, std. dev. 0.02186, critical Tn 2.11
Normality test used: Shapiro Wilk@alpha = 0.1
Calculated = 0.8668
Critical = 0.859 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Barium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

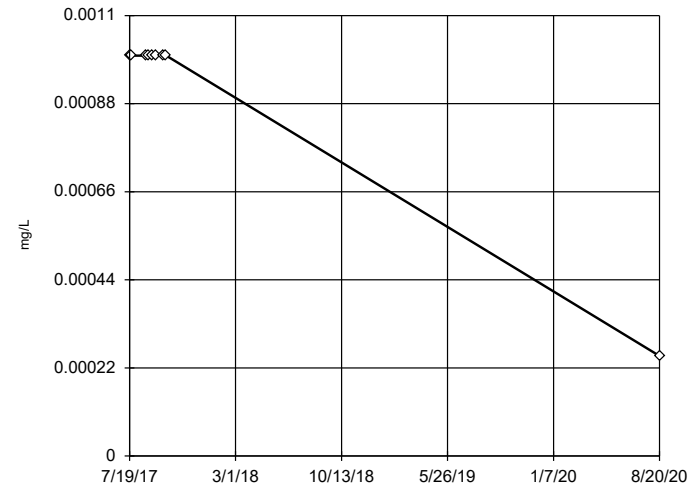
Tukey's Outlier Screening
MW-1



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x⁵ transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

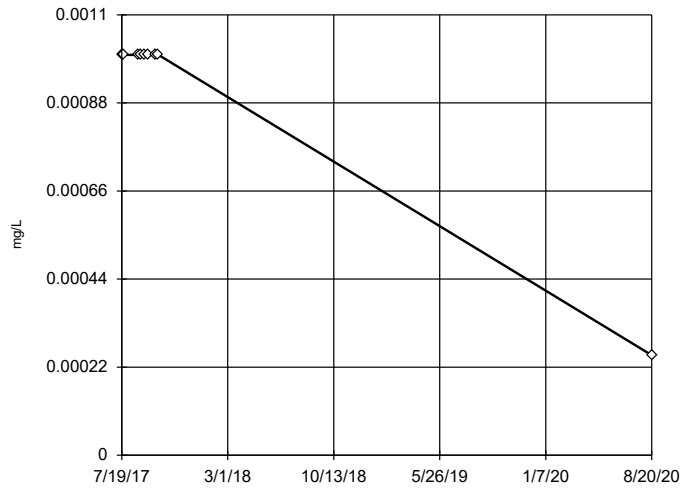
Tukey's Outlier Screening
MW-2



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x⁵ transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

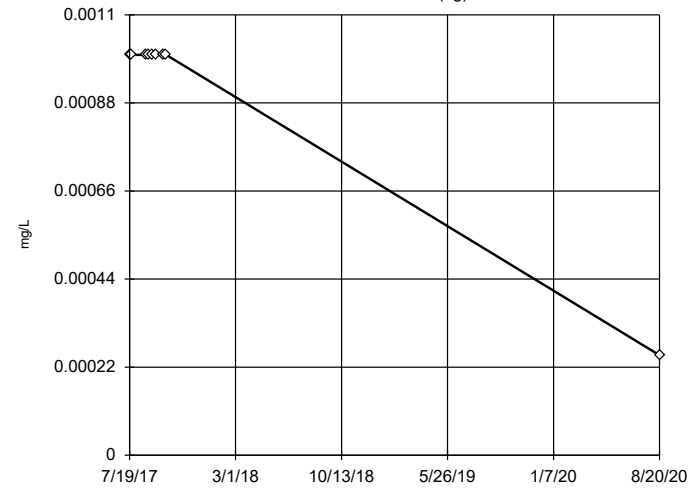
Tukey's Outlier Screening
MW-3



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x⁵ transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:32 AM
Client: GEI Data: Shiras Database

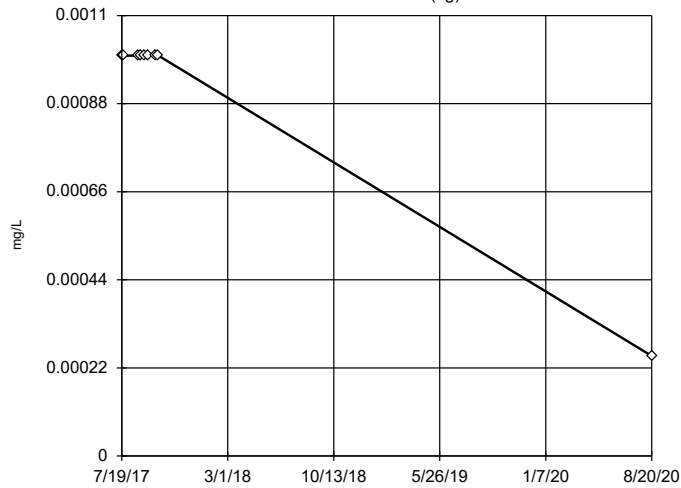
Tukey's Outlier Screening
MW-4 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x⁵ transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

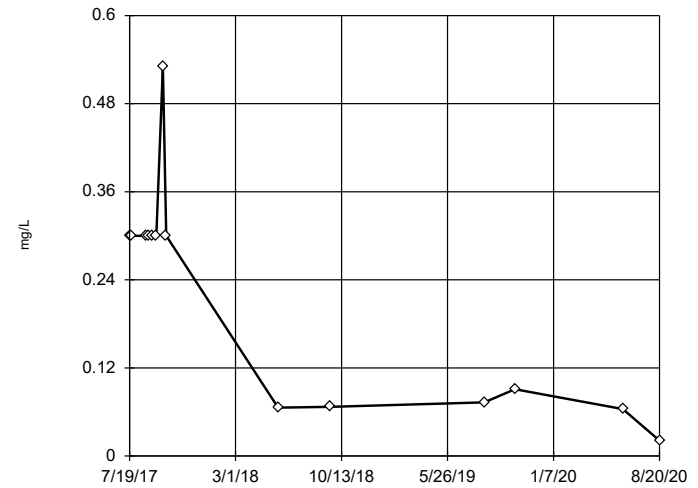
Tukey's Outlier Screening
MW-5 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x⁵ transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Beryllium, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

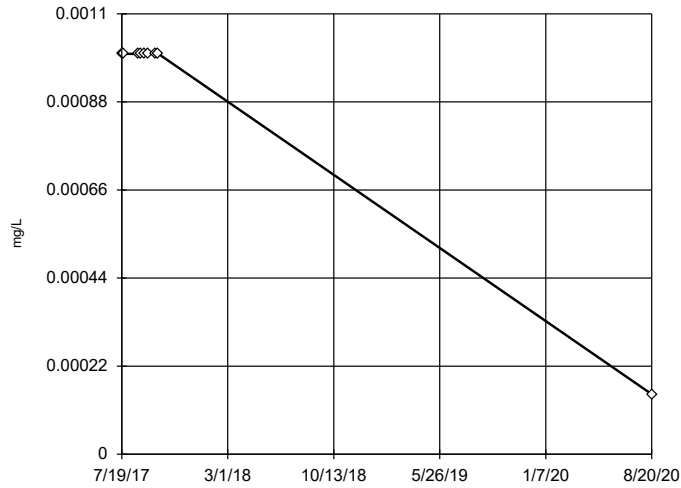
Tukey's Outlier Screening
MW-1



n = 14
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were cube root transformed to achieve best W statistic (graph shown in original units).
High cutoff = 3.127, low cutoff = -0.05829, based on IQR multiplier of 3.

Constituent: Boron Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

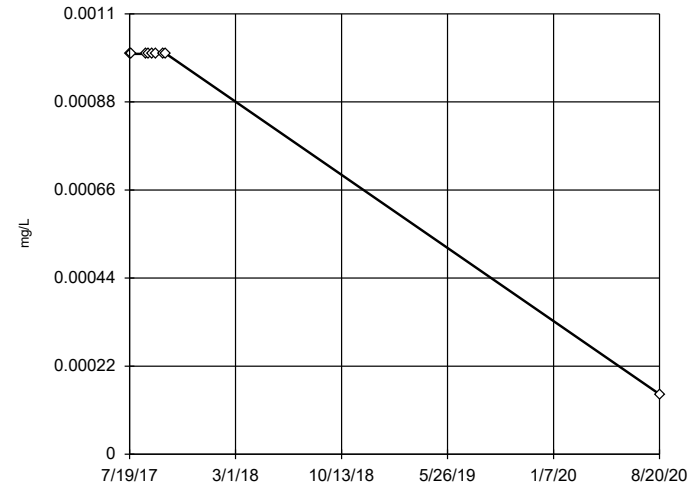
Tukey's Outlier Screening MW-1



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

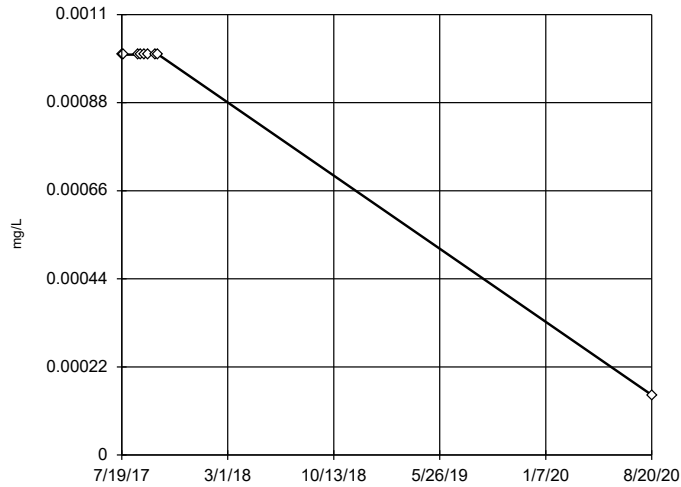
Tukey's Outlier Screening MW-2



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

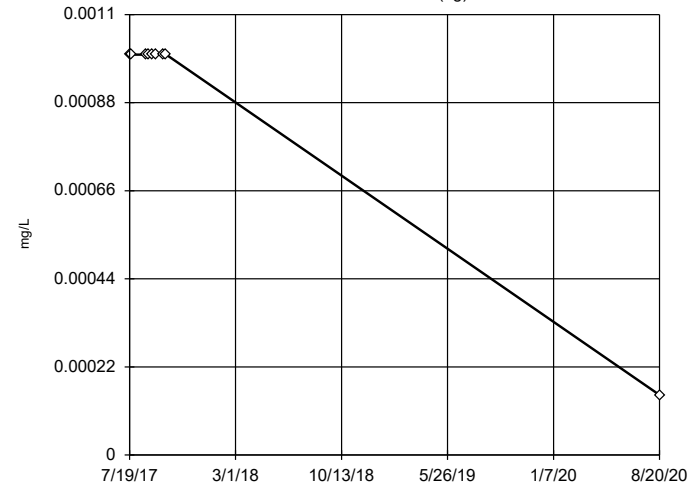
Tukey's Outlier Screening MW-3



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

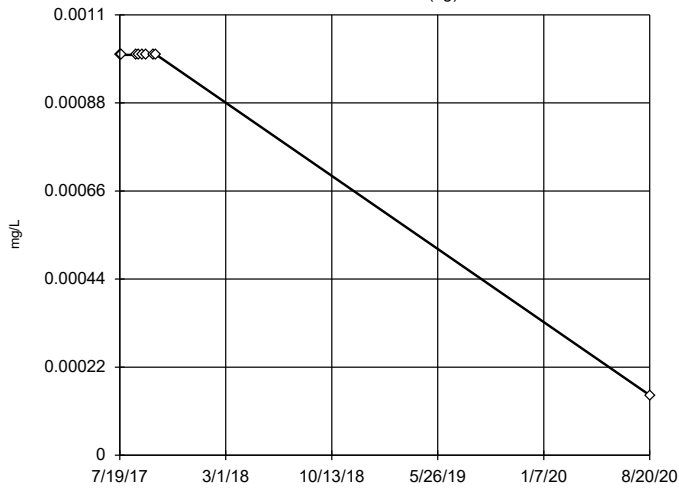
Tukey's Outlier Screening MW-4 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

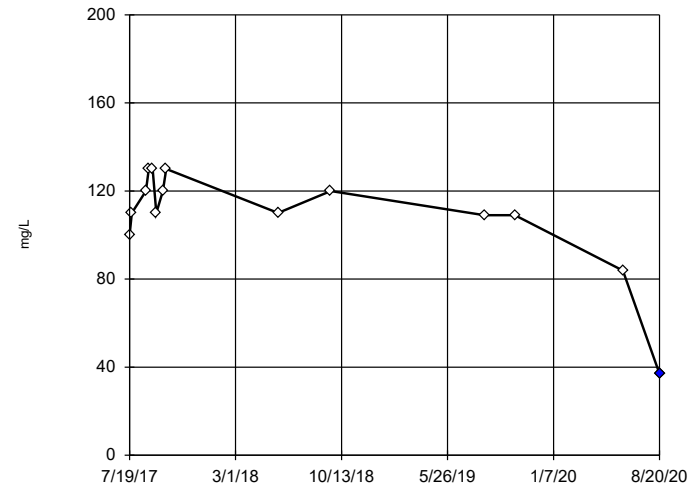
Tukey's Outlier Screening MW-5 (bg)



n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cadmium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

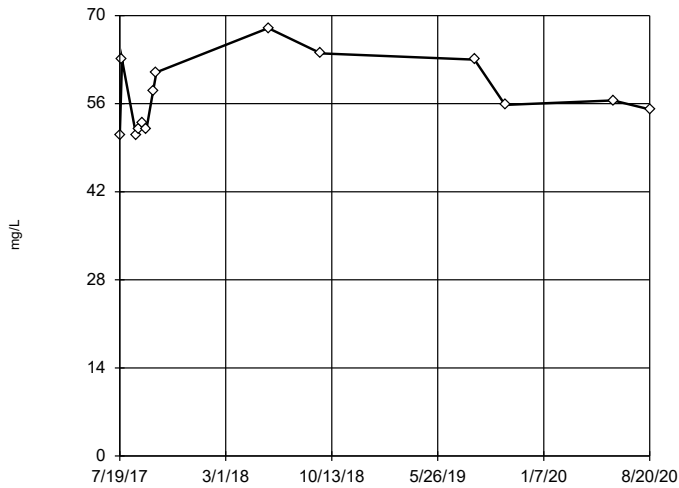
Dixon's Outlier Test MW-1



n = 14
 Statistical outlier is drawn as solid.
 Testing for 2 low outliers.
 Mean = 108.5
 Std. Dev. = 24.15
 83.9: c = 0.5445
 tab1 = 0.546
 Alpha = 0.05
 37: c = 0.6774
 tab1 = 0.546
 Alpha = 0.05
 Normality test used: Shapiro Wilk@alpha = 0.1
 Calculated = 0.9015
 Critical = 0.889
 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

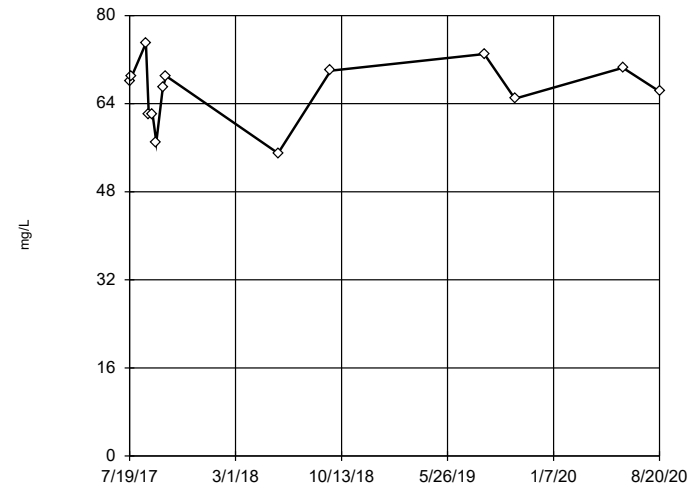
EPA Screening (suspected outliers for Dixon's Test) MW-2



n = 14
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 57.39, std. dev. 5.549, critical Tn 2.371
 Normality test used: Shapiro Wilk@alpha = 0.1
 Calculated = 0.9161
 Critical = 0.895
 The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test) MW-3

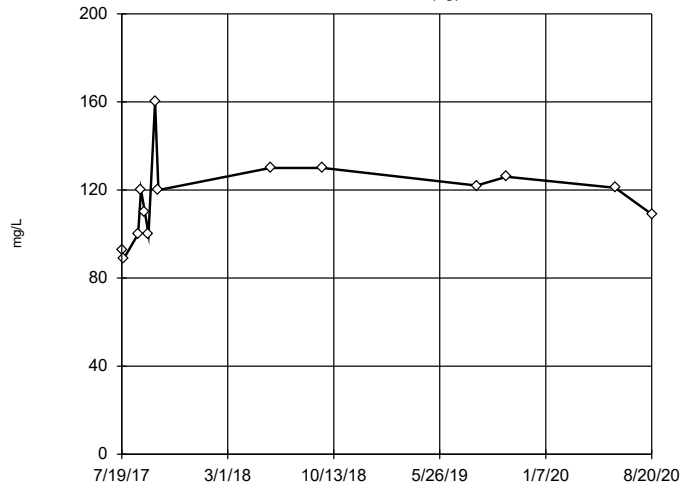


n = 14
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 66.33, std. dev. 5.704, critical Tn 2.371
 Normality test used: Shapiro Wilk@alpha = 0.1
 Calculated = 0.9532
 Critical = 0.895
 The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)

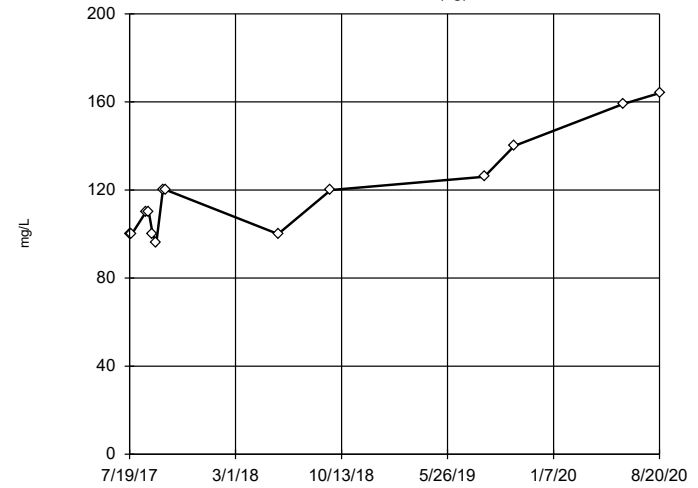


n = 14
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 116.4, std. dev. 18.34, critical Tr 2.371
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9376
 Critical = 0.895
 The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)

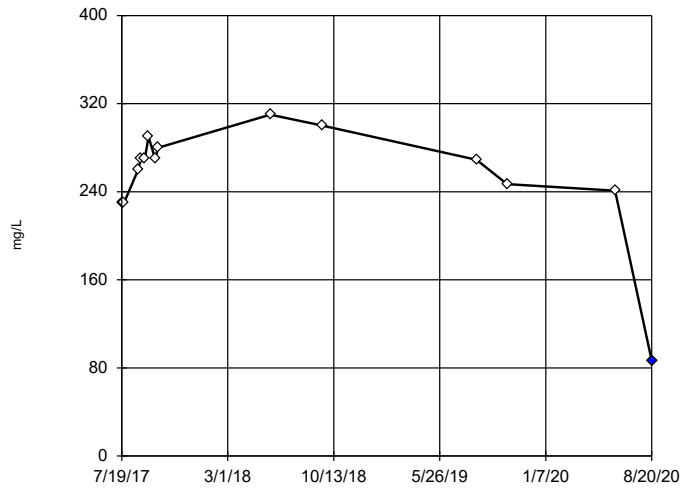


n = 14
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 311.2, low cutoff = 42.68, based on IQR multiplier of 3.

Constituent: Calcium Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test

MW-1

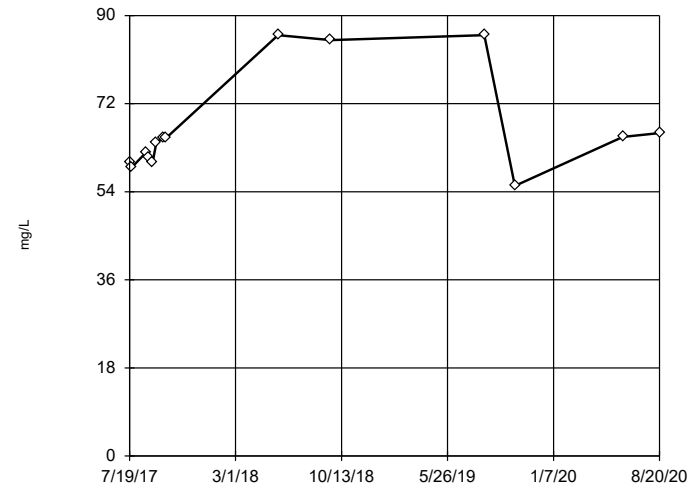


n = 14
 Statistical outlier is drawn as solid.
 Testing for 1 low outlier.
 Mean = 253.8,
 Std. Dev. = 53.79,
 86.7; c = 0.7049
 tab1 = 0.546,
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9541
 Critical = 0.889
 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: Chloride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

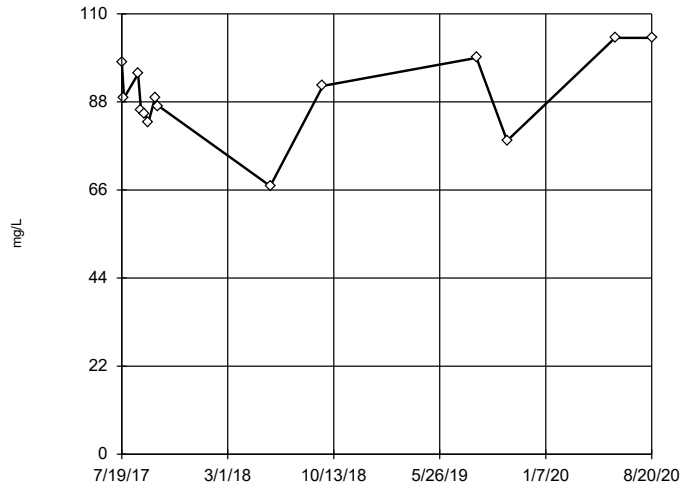


n = 14
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 145.7, low cutoff = 30.84, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test

MW-3

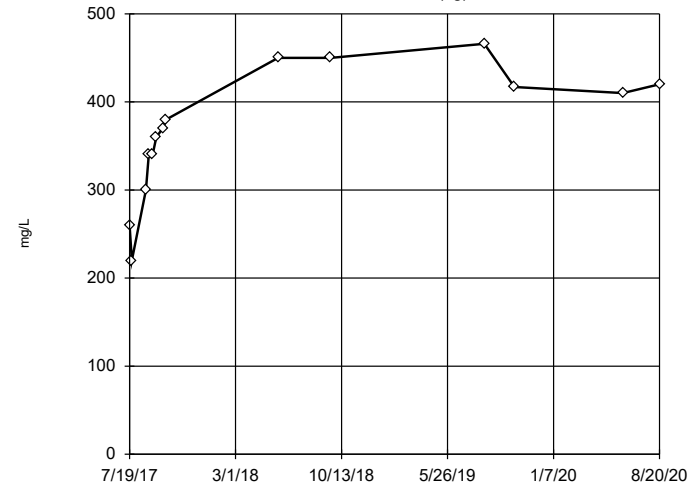


n = 14
 No statistical outliers.
 Testing for 1 low outlier.
 Mean = 89.74.
 Std. Dev = 10.12.
 67: c = 0.5
 tab1 = 0.546.
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9558
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Chloride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)

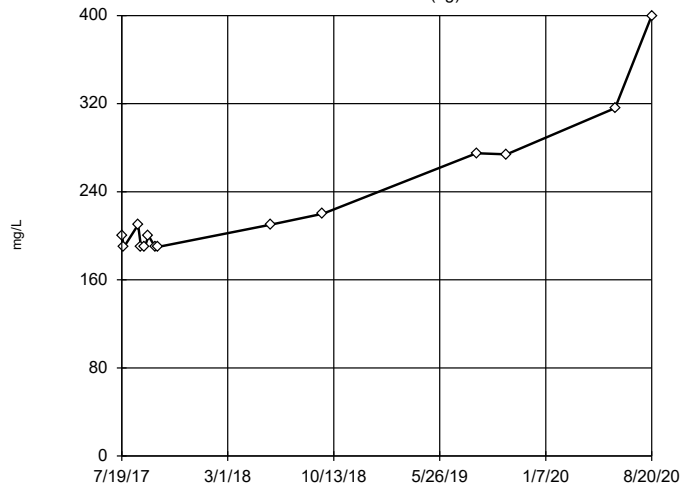


n = 14
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 370.2, std. dev. 73.29, critical Tn 2.371
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9456
 Critical = 0.895
 The distribution was found to be normally distributed.

Constituent: Chloride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)

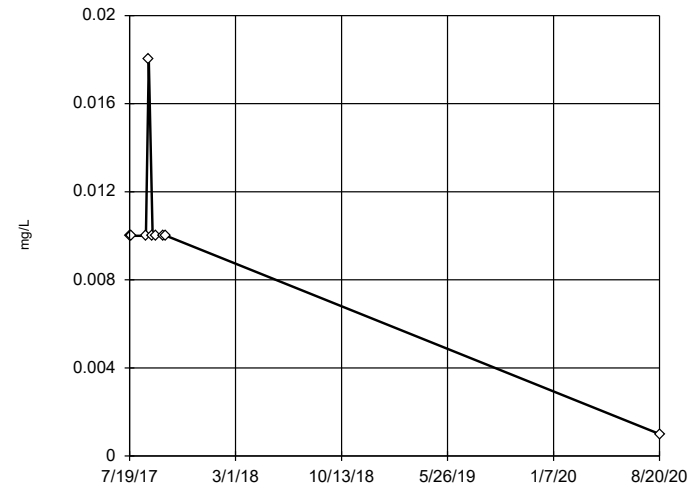


n = 14
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 827.8, low cutoff = 63.01, based on IQR multiplier of 3.

Constituent: Chloride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

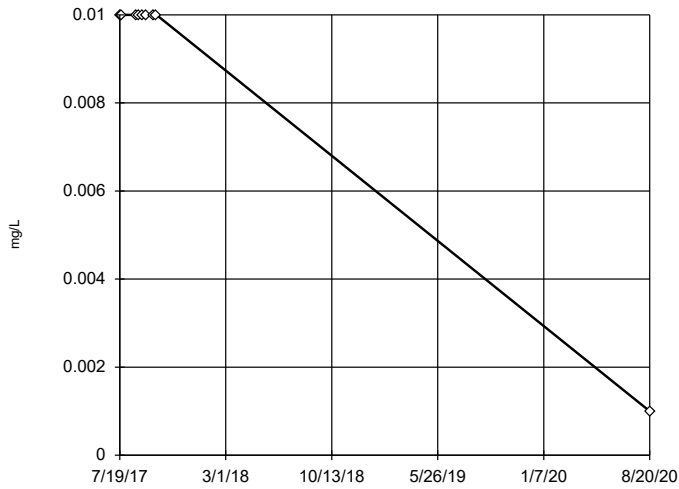
MW-1



n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

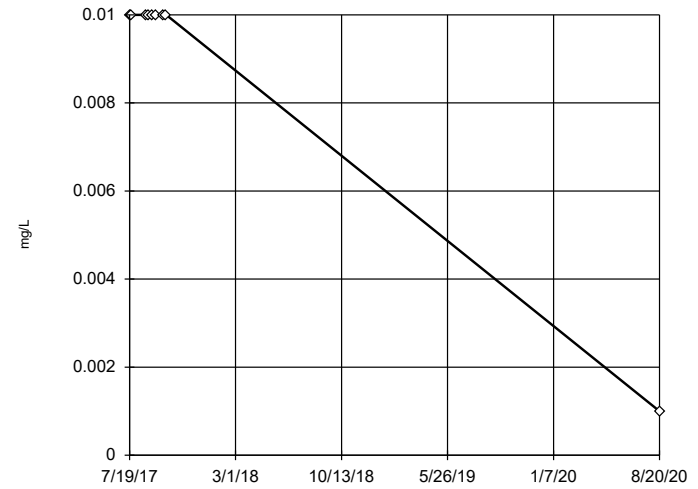
Tukey's Outlier Screening MW-2



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

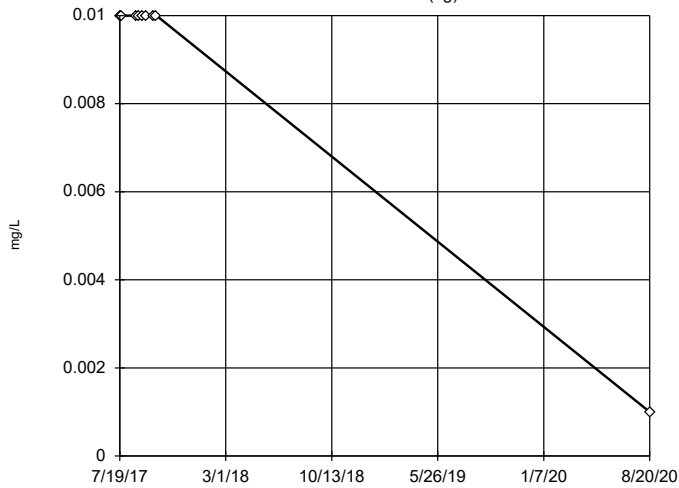
Tukey's Outlier Screening MW-3



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

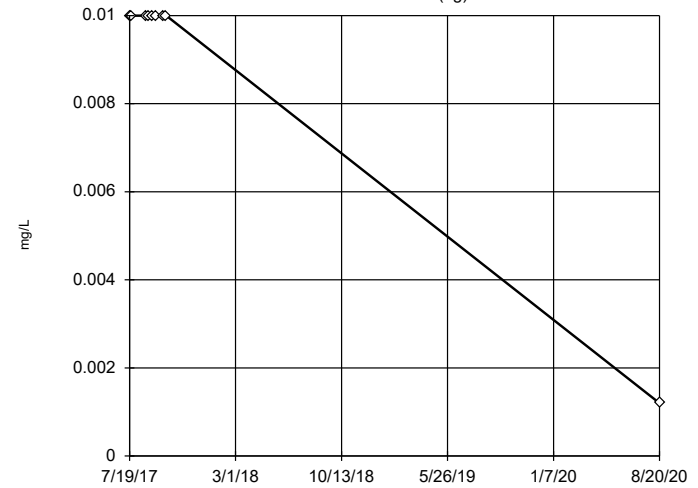
Tukey's Outlier Screening MW-4 (bg)



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening MW-5 (bg)

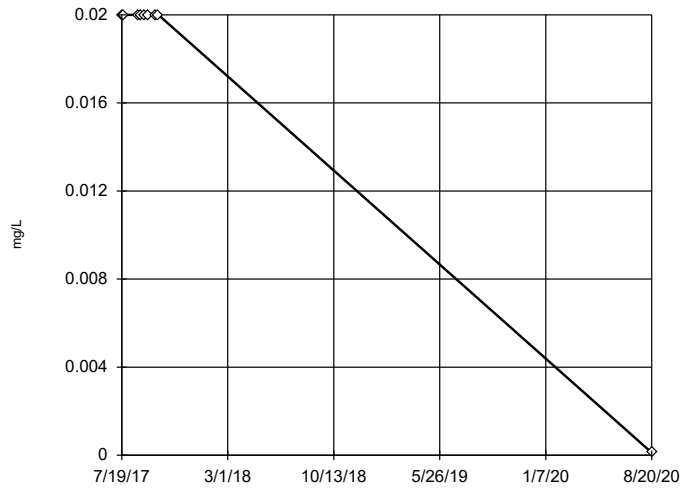


n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x^5 transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Chromium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-1



n = 9

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

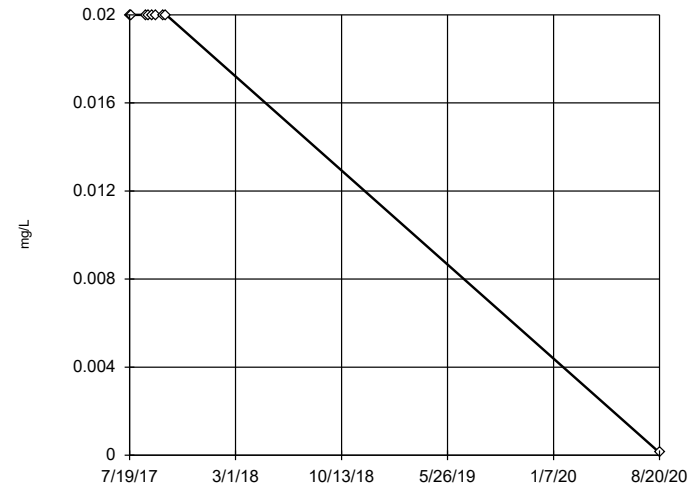
Data were square transformed to achieve best W statistic (graph shown in original units).

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

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2



n = 9

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

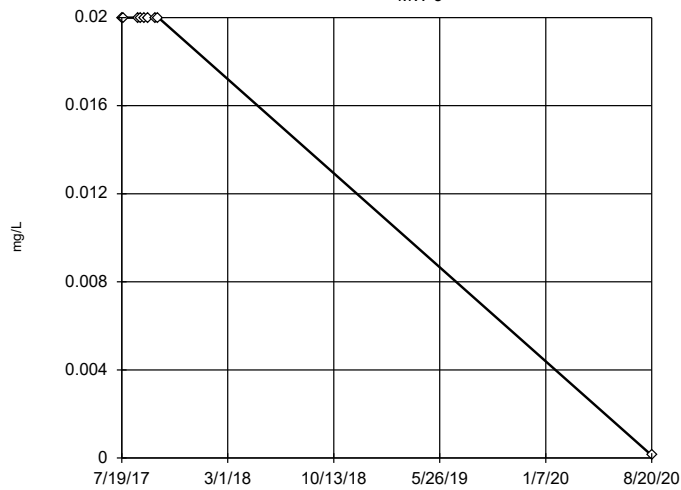
Data were square transformed to achieve best W statistic (graph shown in original units).

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

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-3



n = 9

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

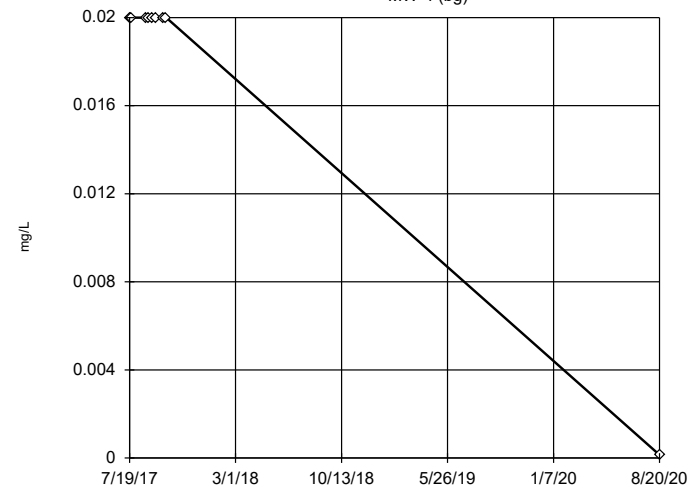
Data were square transformed to achieve best W statistic (graph shown in original units).

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

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-4 (bg)



n = 9

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

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

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

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

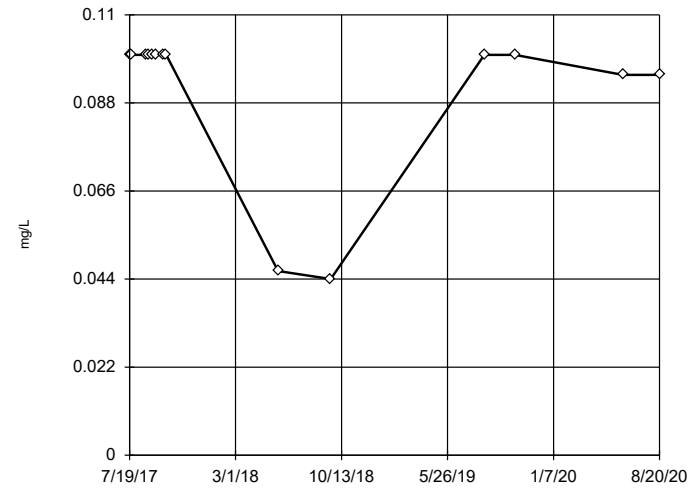
Tukey's Outlier Screening MW-5 (bg)



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Cobalt, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

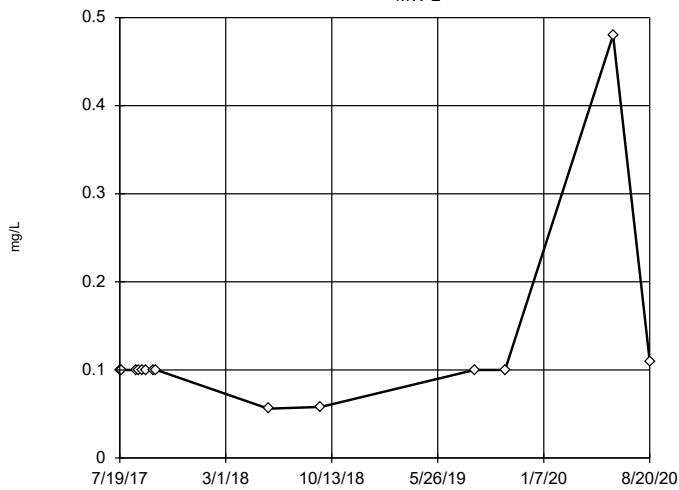
Tukey's Outlier Screening MW-1



n = 14
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Fluoride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

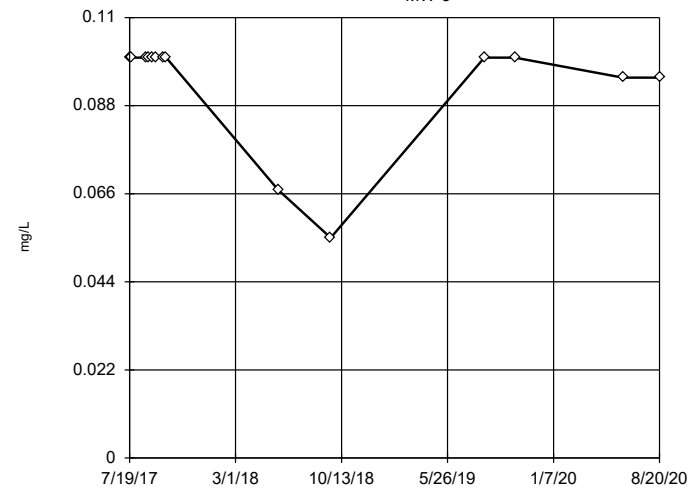
Tukey's Outlier Screening MW-2



n = 14
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Fluoride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

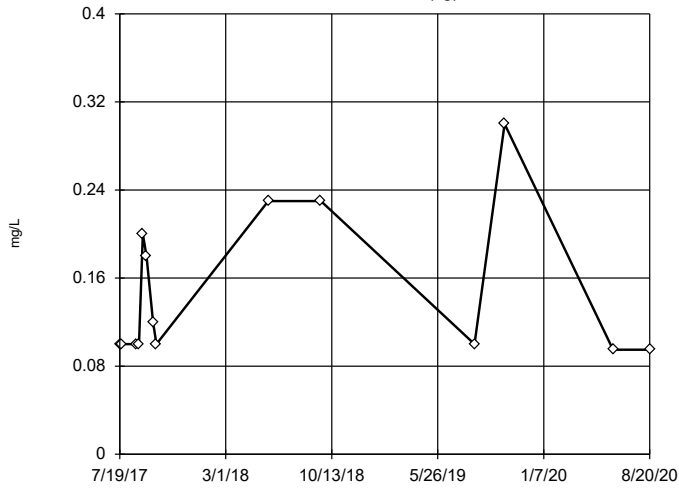
Tukey's Outlier Screening MW-3



n = 14
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Fluoride Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

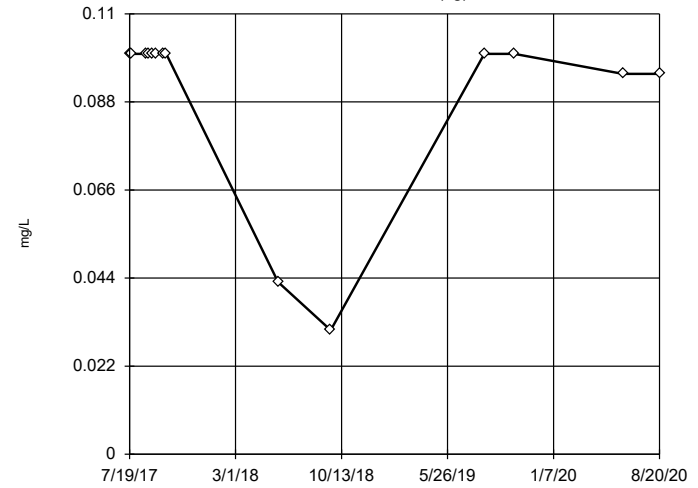
Tukey's Outlier Screening
MW-4 (bg)



n = 14
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 2.116, low cutoff = 0.01014, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

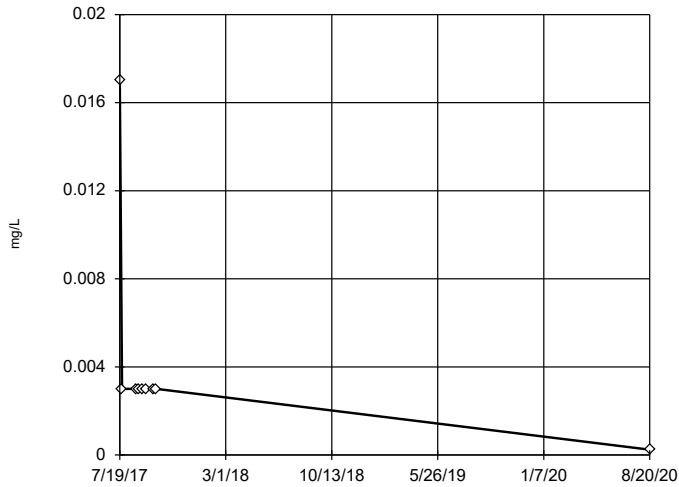
Tukey's Outlier Screening
MW-5 (bg)



n = 14
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were x*6 transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Constituent: Fluoride Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

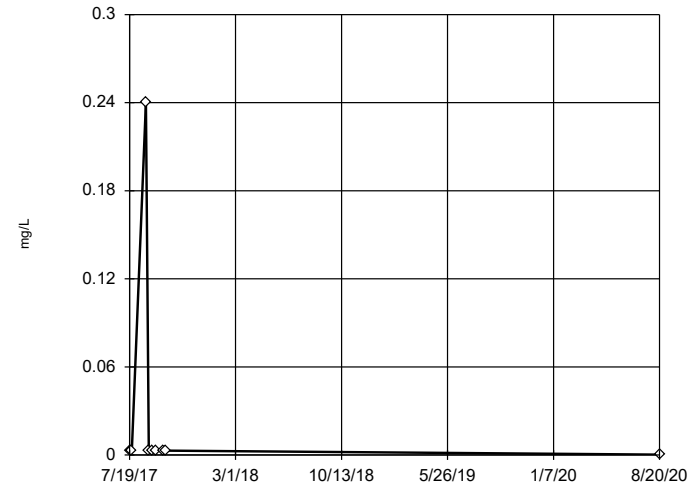
Tukey's Outlier Screening
MW-1



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were cube root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

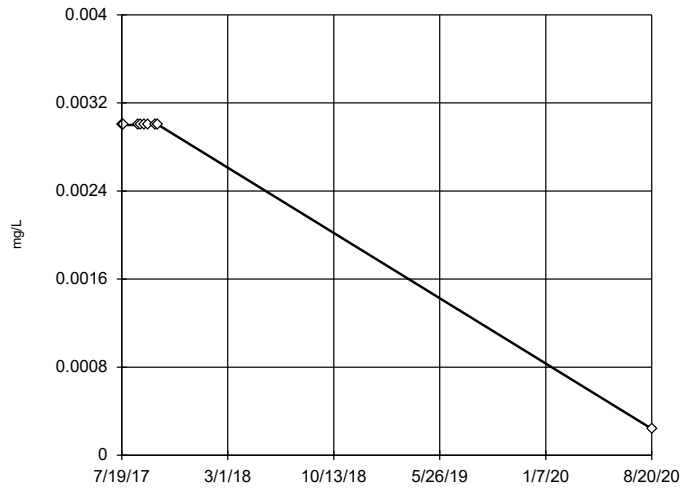
Tukey's Outlier Screening
MW-2



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

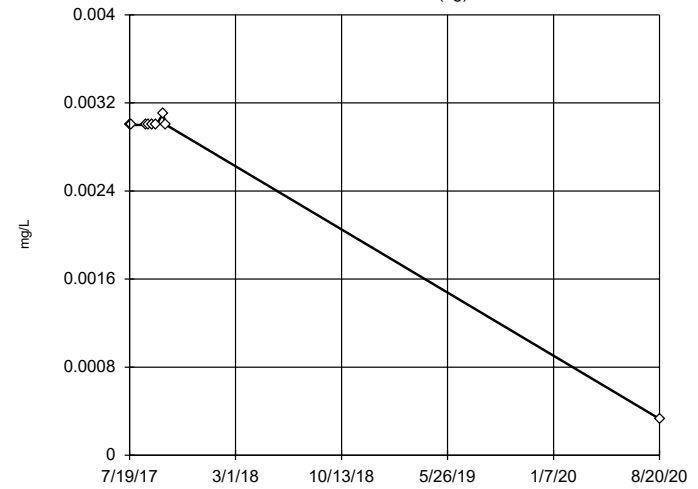
Tukey's Outlier Screening MW-3



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

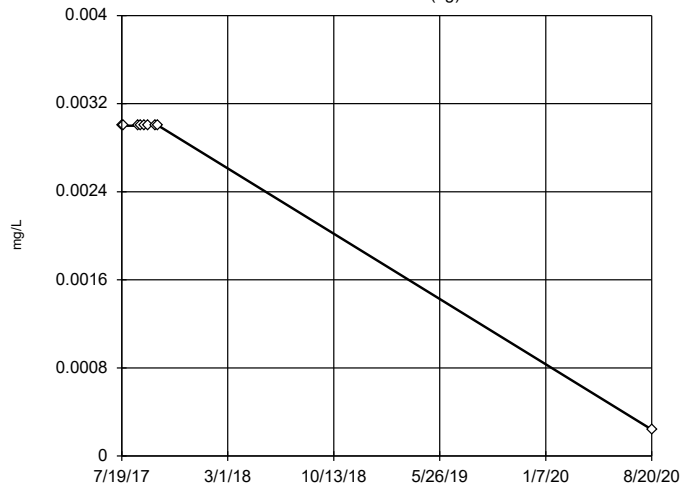
Tukey's Outlier Screening MW-4 (bg)



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

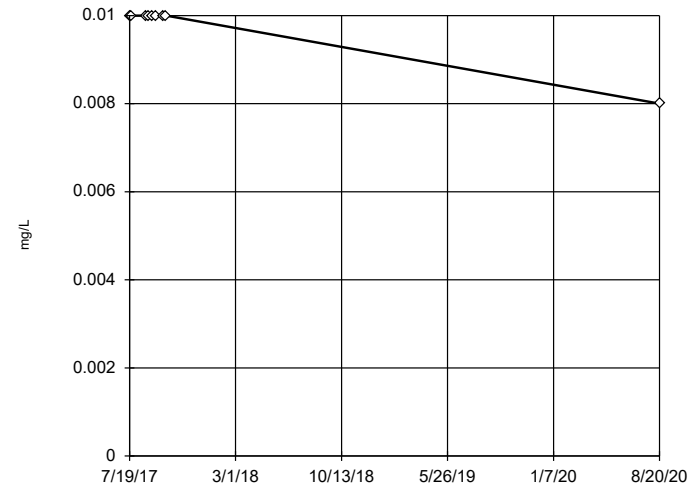
Tukey's Outlier Screening MW-5 (bg)



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lead, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening MW-1

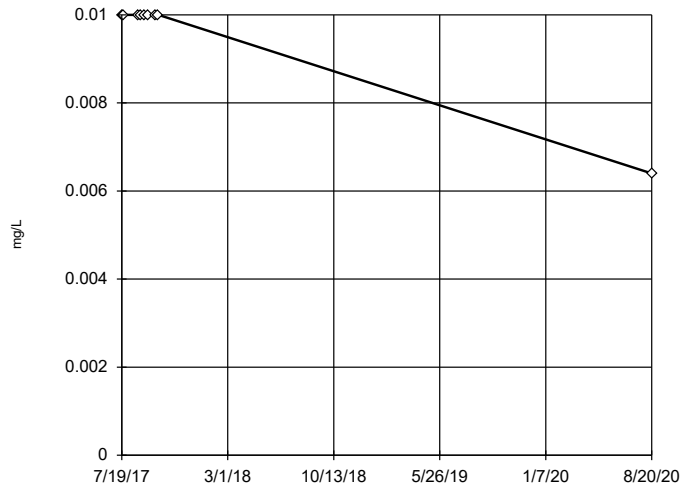


n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lithium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

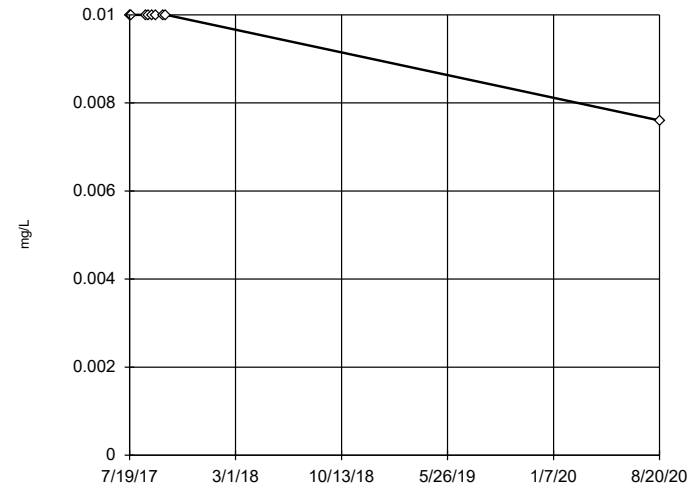


n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lithium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-3

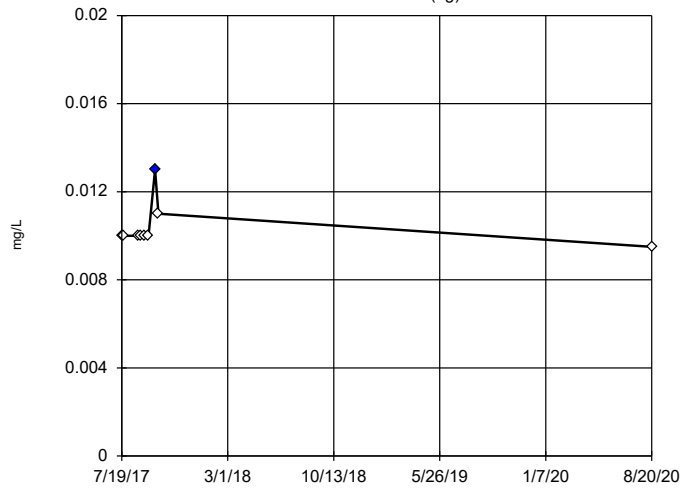


n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Lithium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-4 (bg)

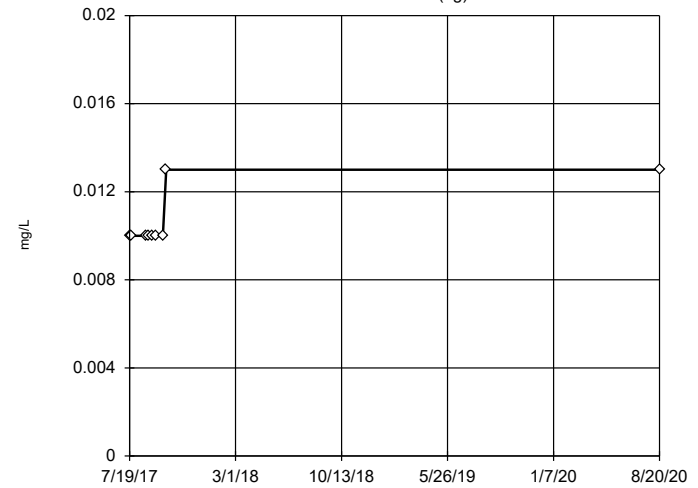


n = 9
 Outlier is drawn as solid.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.0121,
 low cutoff = 0.008668,
 based on IQR multiplier of 3.

Constituent: Lithium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)

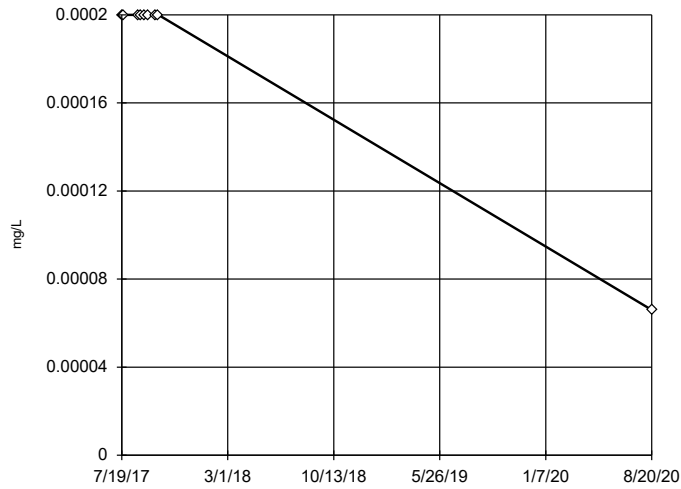


n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 0.01639,
 low cutoff = 0.006237,
 based on IQR multiplier of 3.

Constituent: Lithium, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-1

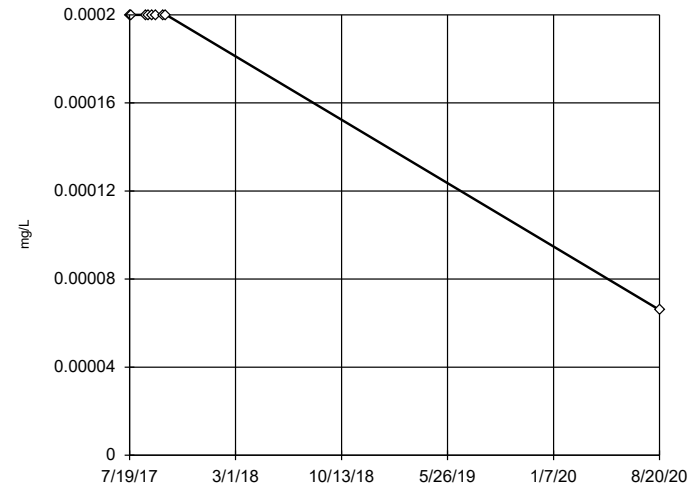


n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

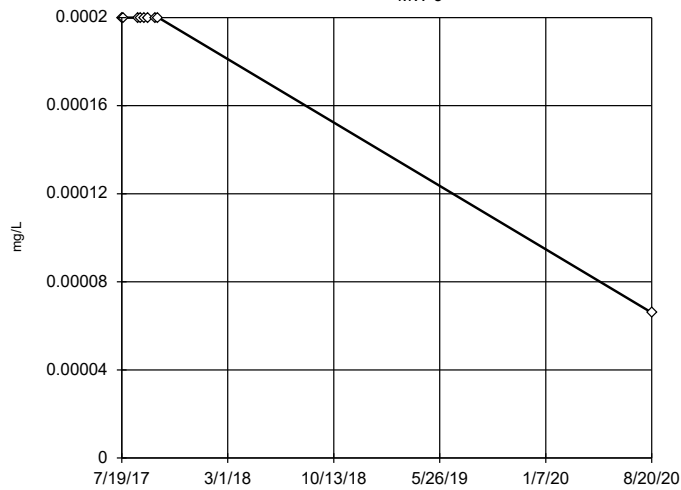


n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-3

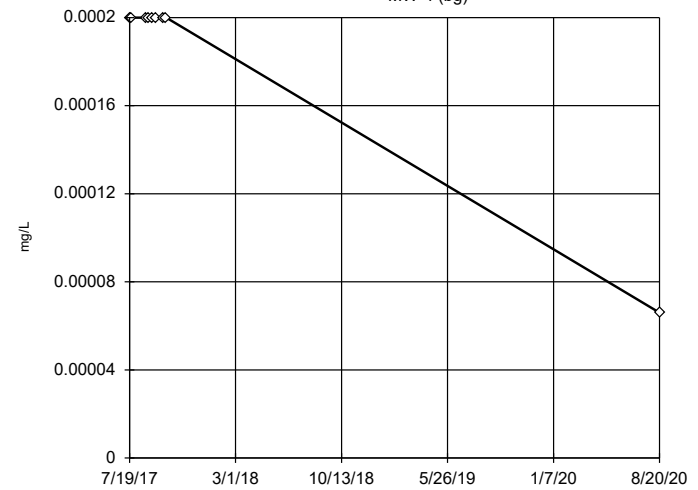


n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

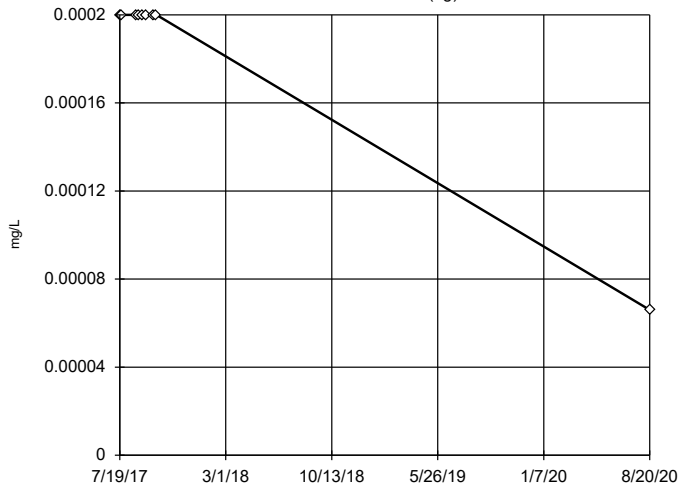
MW-4 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, Total Analysis Run 11/4/2020 8:33 AM
Client: GEI Data: Shiras Database

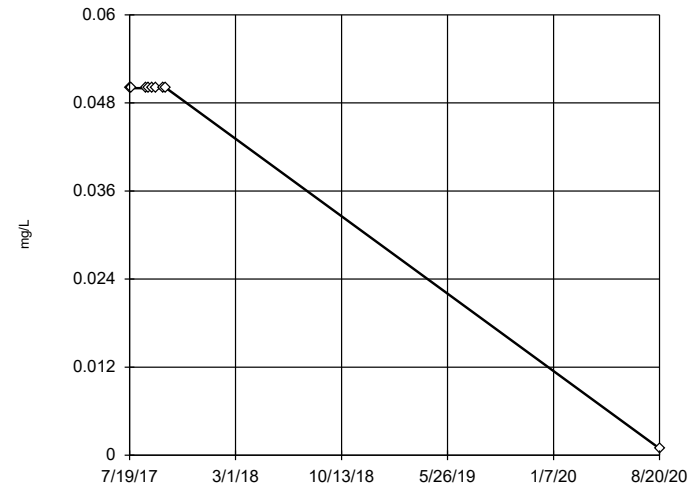
Tukey's Outlier Screening MW-5 (bg)



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Mercury, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

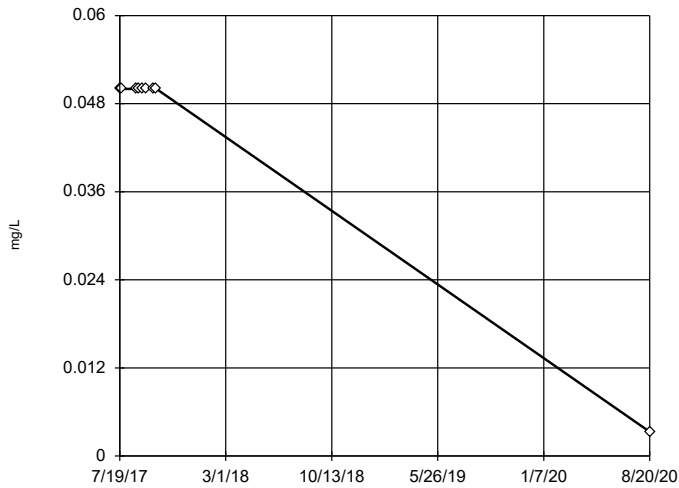
Tukey's Outlier Screening MW-1



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

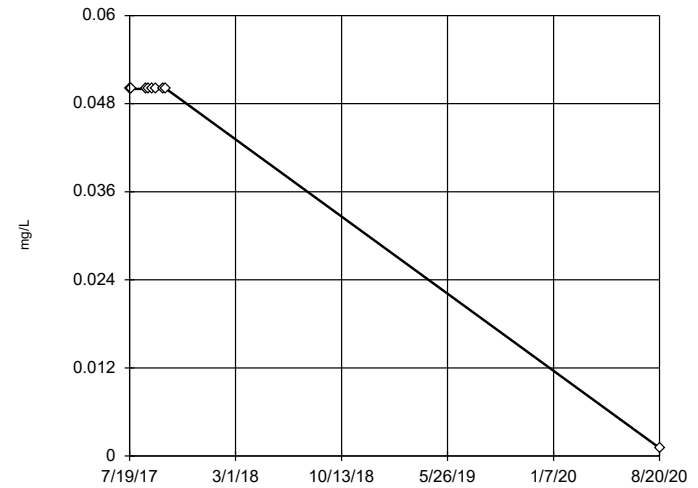
Tukey's Outlier Screening MW-2



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

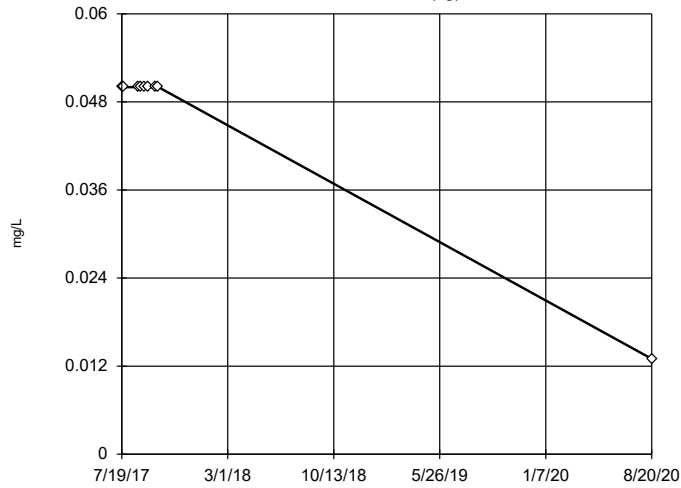
Tukey's Outlier Screening MW-3



n = 9
 No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

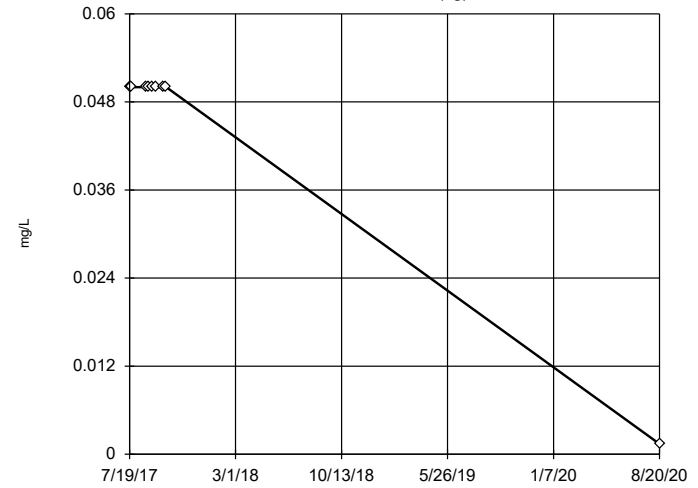
Tukey's Outlier Screening MW-4 (bg)



n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were square root transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

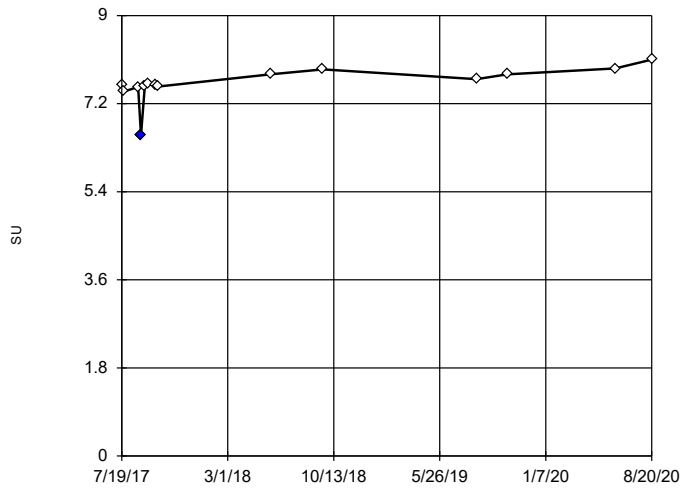
Tukey's Outlier Screening MW-5 (bg)



n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were square transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Molybdenum, Total Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

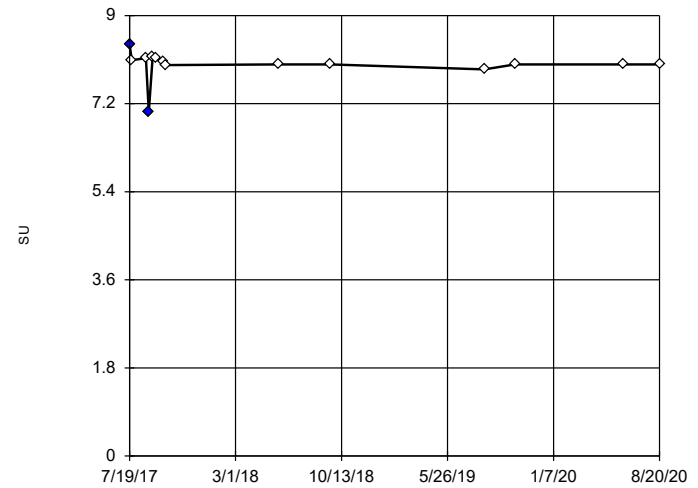
Dixon's Outlier Test MW-1



n = 14
 Statistical outlier is drawn as solid.
 Testing for 1 low outlier.
 Mean = 7.517
 Std. Dev. = 0.3553
 6.56: c = 0.7313
 tabl = 0.546
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9095
 Critical = 0.889
 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

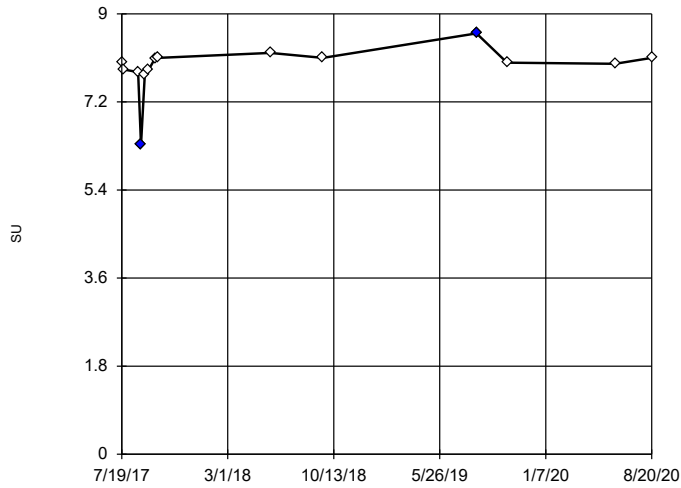
Dixon's Outlier Test MW-2



n = 14
 Statistical outliers are drawn as solid.
 Testing for 1 high and 1 low outliers.
 Mean = 7.993
 8.41: c = 0.6667
 Std. Dev. = 0.3023
 7.03: c = 0.8727
 tabl = 0.546
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.8915
 Critical = 0.883
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:33 AM
 Client: GEI Data: Shiras Database

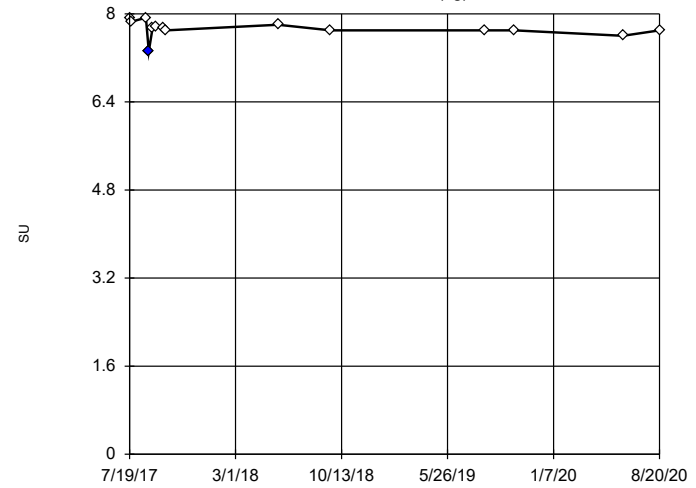
Dixon's Outlier Test MW-3



n = 14
 Statistical outliers are drawn as solid.
 Testing for 1 high and 1 low outliers.
 Mean = 7.913,
 Std. Dev. = 0.5027,
 8.6: c = 0.6329
 tab1 = 0.546,
 6.32: c = 0.8371
 tab1 = 0.546,
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9256
 Critical = 0.883
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

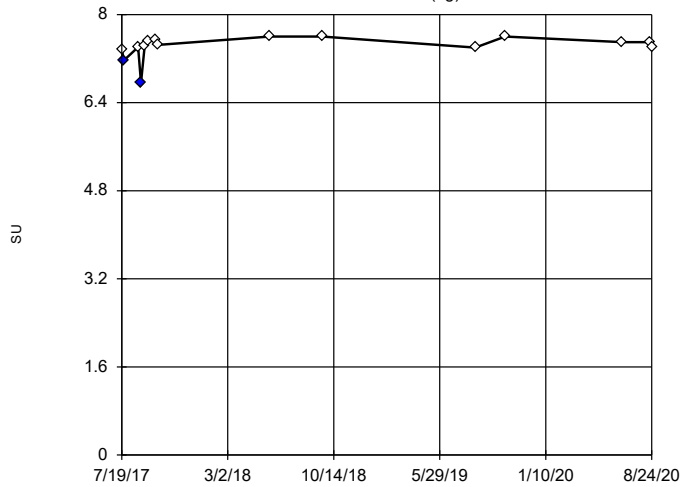
Dixon's Outlier Test MW-4 (bg)



n = 14
 Statistical outlier is drawn as solid.
 Testing for 1 low outlier.
 Mean = 7.728,
 Std. Dev. = 0.1492,
 7.32: c = 0.7037
 tab1 = 0.546,
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9056
 Critical = 0.889
 The distribution, after removal of suspect value, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

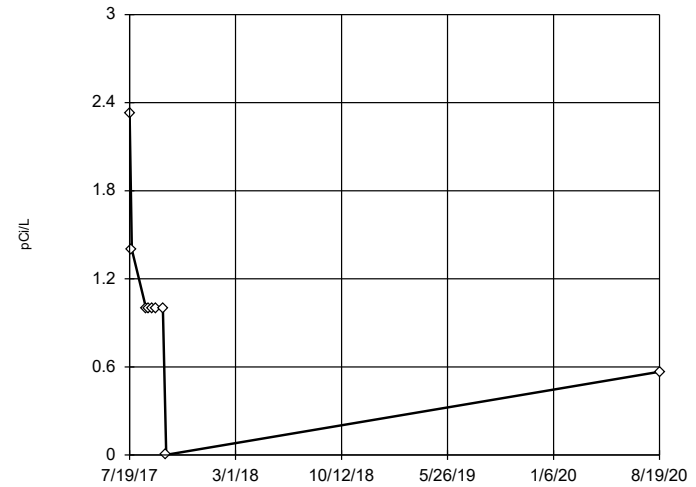
Dixon's Outlier Test MW-5 (bg)



n = 15
 Statistical outliers are drawn as solid.
 Testing for 2 low outliers.
 Mean = 7.417,
 Std. Dev. = 0.2131,
 7.17: c = 0.5349
 tab1 = 0.525,
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9229
 Critical = 0.889
 The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: pH [field] Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening MW-1

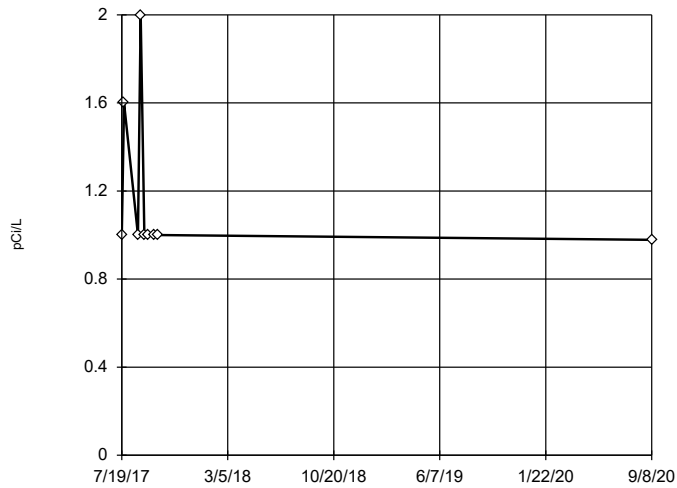


n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Ladder of Powers transformations did not improve normality; analysis run on raw data.
 High cutoff = 2.45, low cutoff = -0.466, based on IQR multiplier of 3.

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

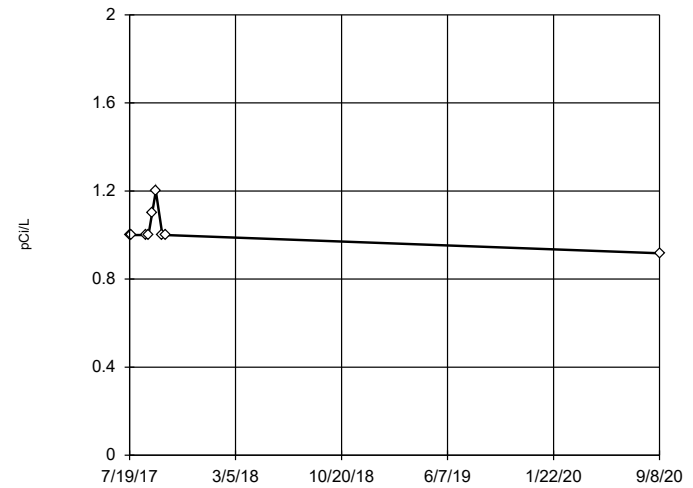


n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 2.56, low cutoff = 0.4941, based on IQR multiplier of 3.

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-3

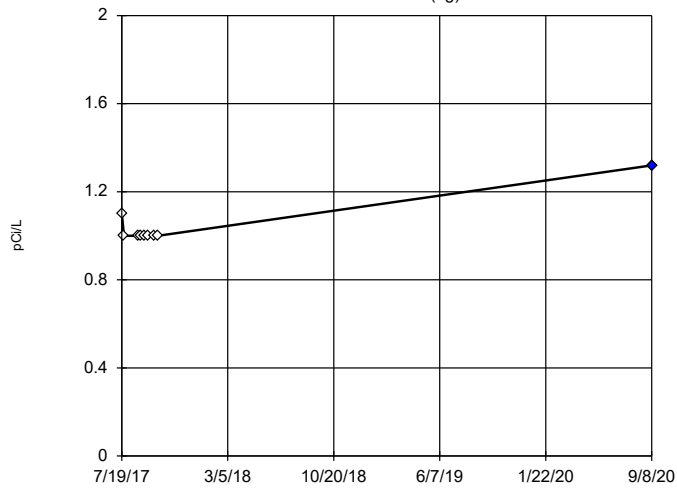


n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1.21, low cutoff = 0.8668, based on IQR multiplier of 3.

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-4 (bg)

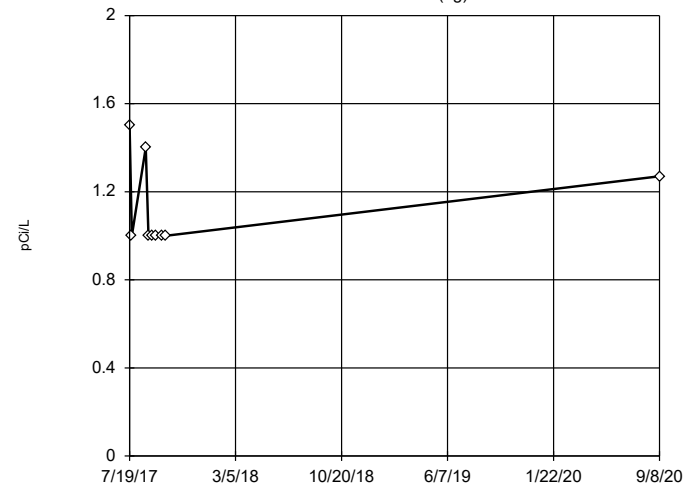


n = 9
 Outlier is drawn as solid.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were natural log transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1.21, low cutoff = 0.8668, based on IQR multiplier of 3.

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)

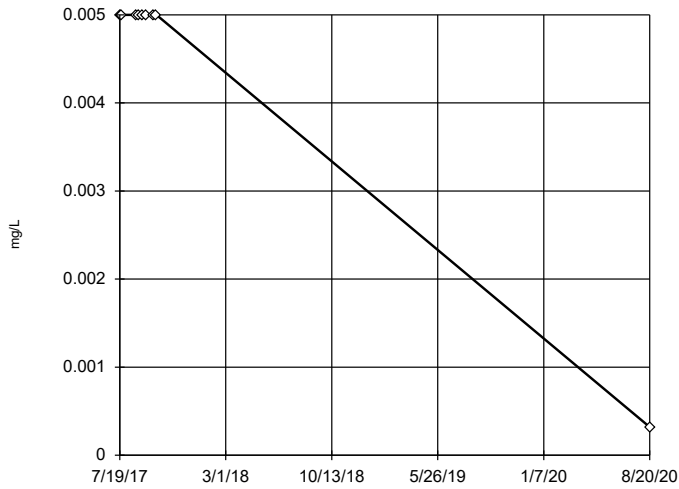


n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were cube transformed to achieve best W statistic (graph shown in original units).
 High cutoff = 1.874, low cutoff = -1.472, based on IQR multiplier of 3.

Constituent: Radium 224 and 226 Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-1

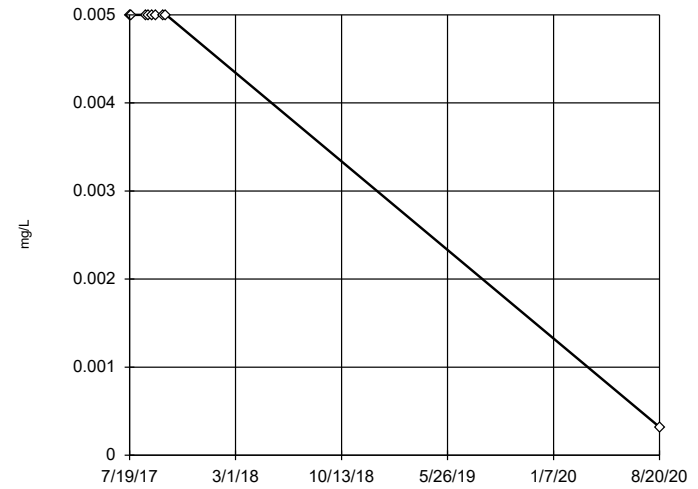


n = 9
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium, Total Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2

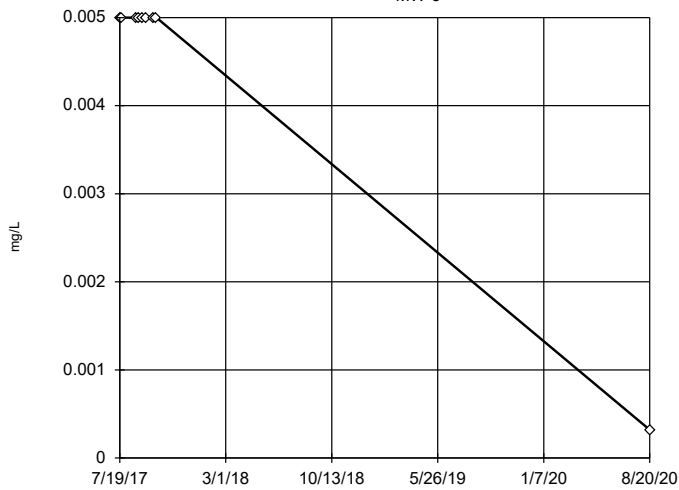


n = 9
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium, Total Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-3

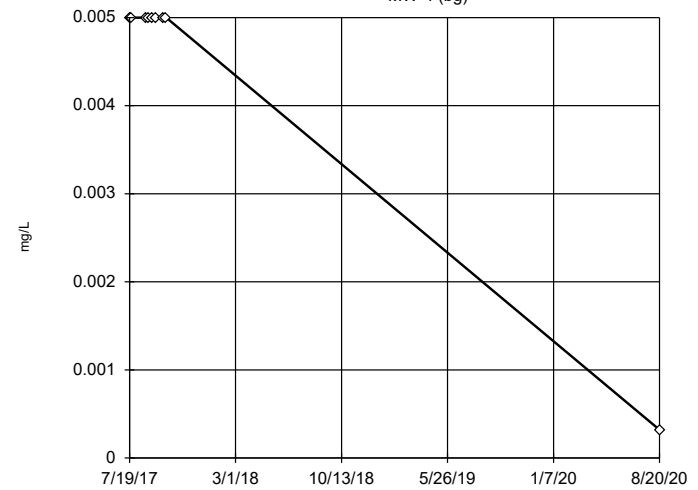


n = 9
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium, Total Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

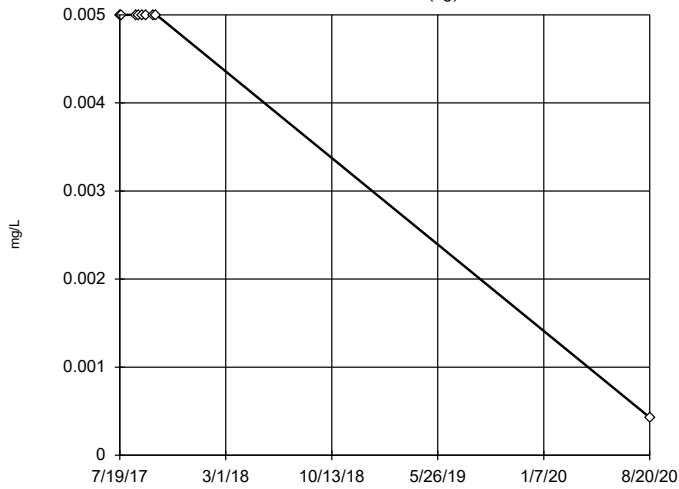
MW-4 (bg)



n = 9
No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Ladder of Powers transformations did not improve normality; analysis run on raw data.
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium, Total Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

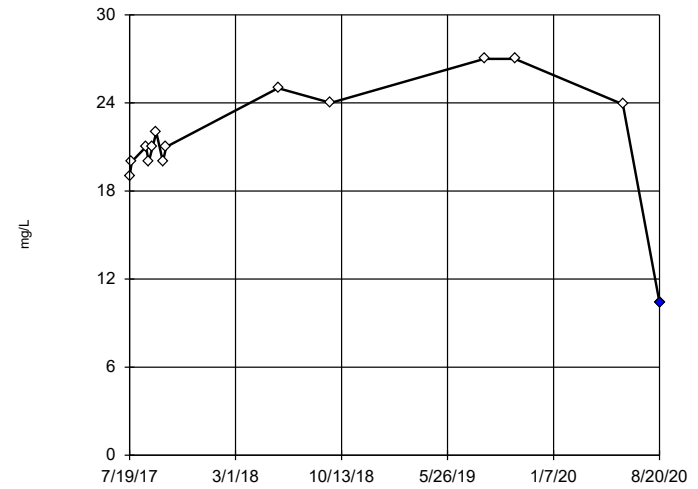
Tukey's Outlier Screening
MW-5 (bg)



n = 9
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were square root transformed to achieve best W statistic (graph shown in original units).
The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Selenium, Total Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

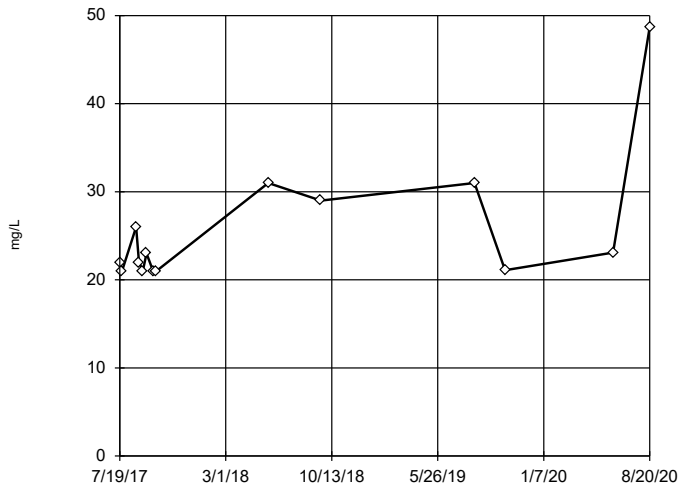
Dixon's Outlier Test
MW-1



n = 14
Statistical outlier is drawn as solid. Testing for 1 low outlier. Mean = 21.52, Std. Dev. = 4.132, 2.342: c = 0.7456, tab1 = 0.546, Alpha = 0.05.
Normality test used: Shapiro Wilk@alpha = 0.1
Calculated = 0.9017
Critical = 0.889 (after natural log transformation)
The distribution, after removal of suspect value, was found to be log-normal.

Constituent: Sulfate Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

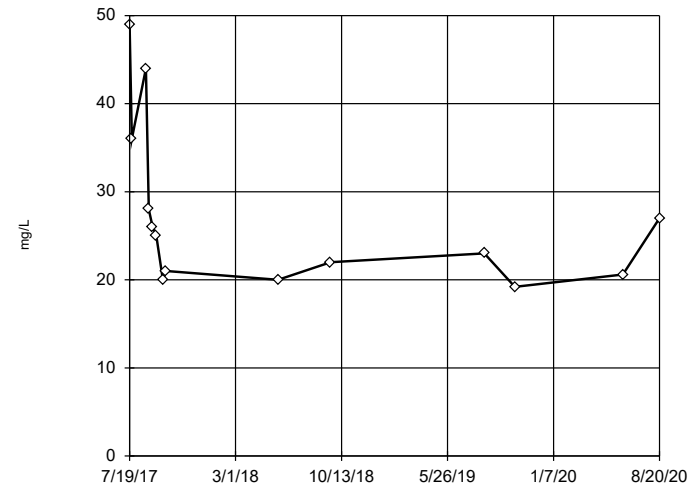
Tukey's Outlier Screening
MW-2



n = 14
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 87.27, low cutoff = 7.215, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening
MW-3

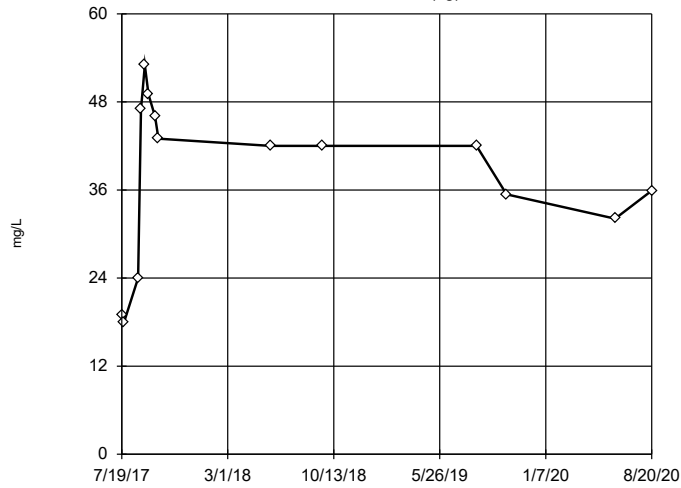


n = 14
No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
Data were natural log transformed to achieve best W statistic (graph shown in original units).
High cutoff = 121.5, low cutoff = 5.304, based on IQR multiplier of 3.

Constituent: Sulfate Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-4 (bg)

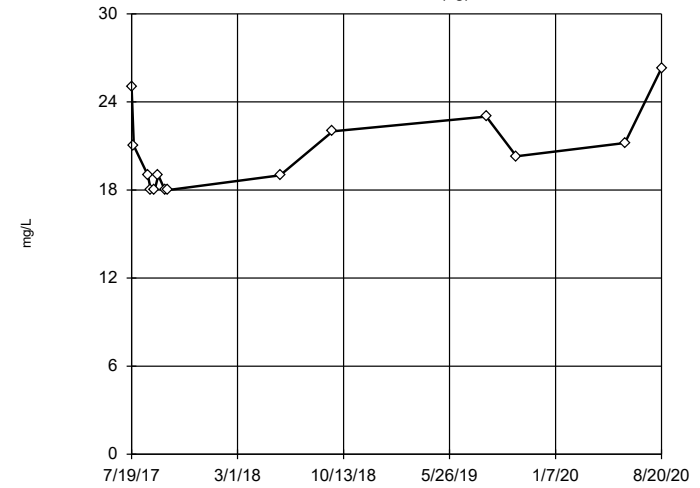


n = 14
 Dixon's will not be run.
 No suspect values identified or unable to establish suspect values.
 Mean 37.74, std. dev. 10.98, critical Tr 2.371
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.9163
 Critical = 0.895
 The distribution was found to be normally distributed.

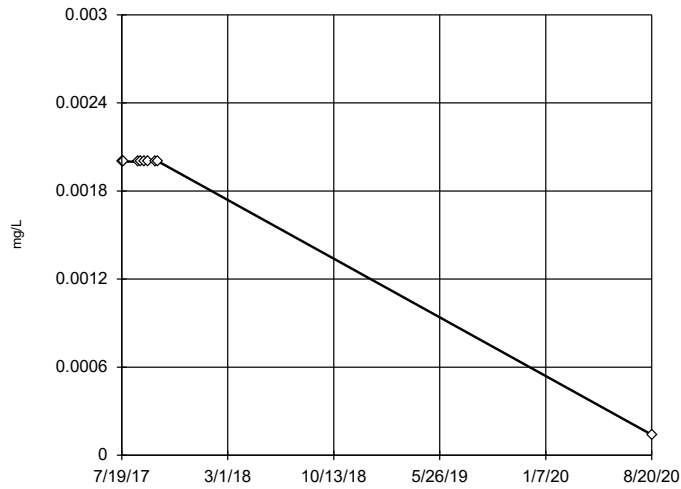
Constituent: Sulfate Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)



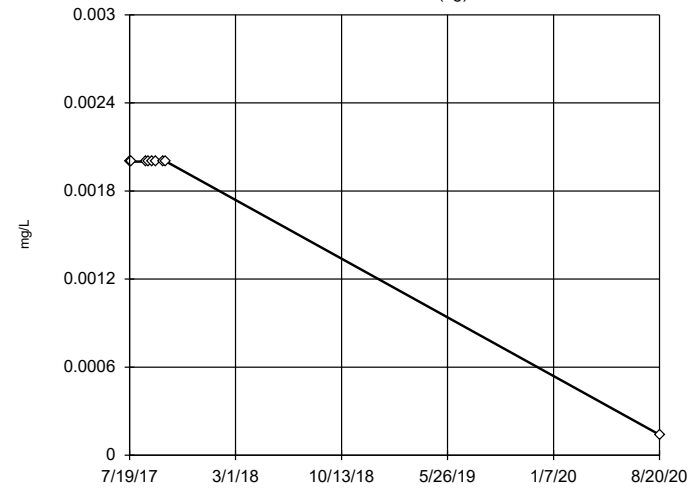
Tukey's Outlier Screening MW-3



n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium, Total Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

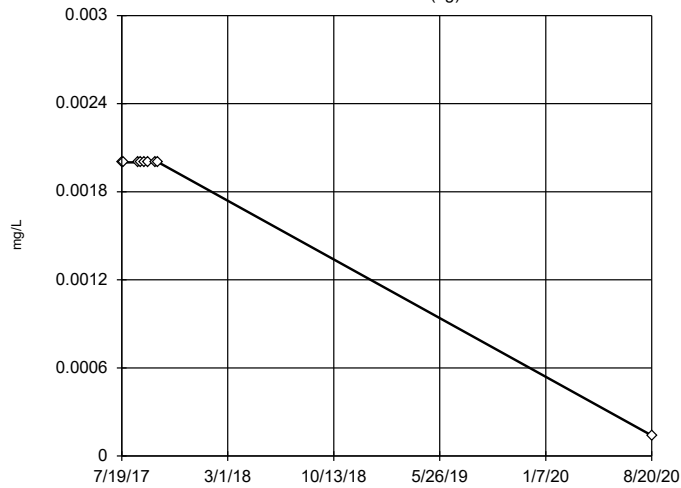
Tukey's Outlier Screening MW-4 (bg)



n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium, Total Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

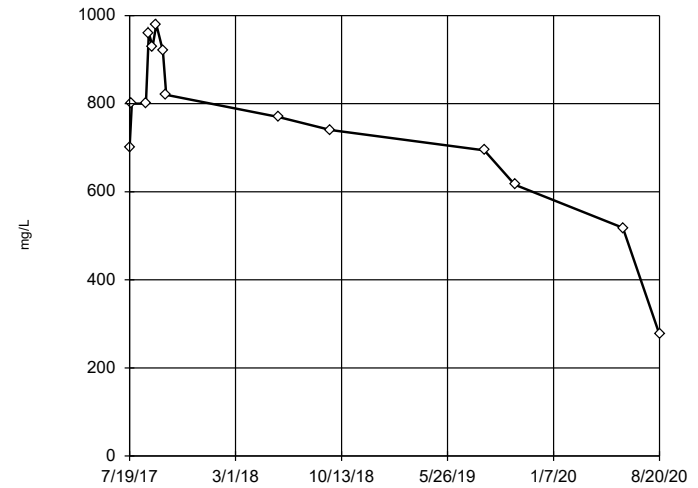
Tukey's Outlier Screening MW-5 (bg)



n = 9
 No outliers found.
 Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.
 Data were x*6 transformed to achieve best W statistic (graph shown in original units).
 The results were invalidated, because the lower and upper quartiles are equal.

Constituent: Thallium, Total Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Dixon's Outlier Test MW-1

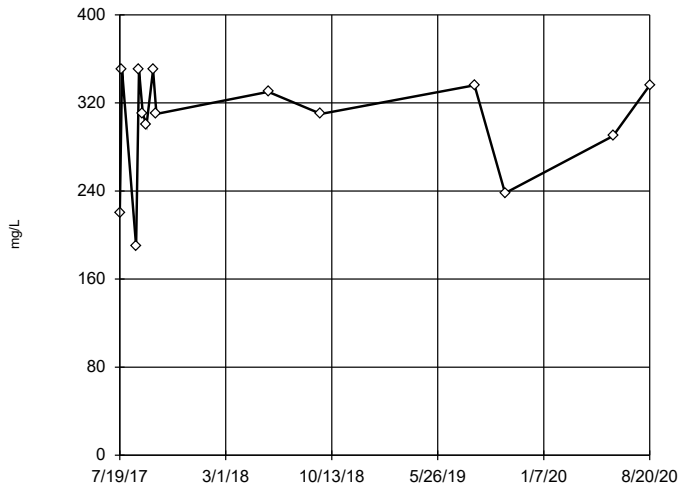


n = 14
 No statistical outliers.
 Testing for 1 low outlier.
 Mean = 751.7.
 Std. Dev. = 190.3.
 276; c = 0.5199
 tab1 = 0.546.
 Alpha = 0.05.
 Normality test used:
 Shapiro Wilk@alpha = 0.1
 Calculated = 0.96
 Critical = 0.889
 The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:34 AM
 Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-2



n = 14

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

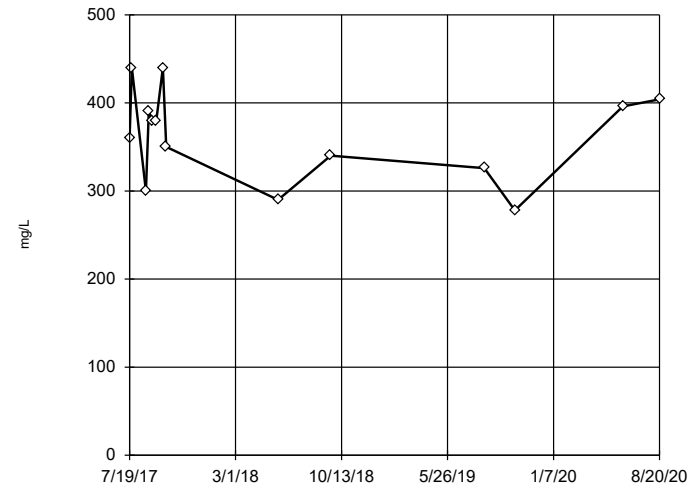
Data were x⁵ transformed to achieve best W statistic (graph shown in original units).

High cutoff = 430.9, low cutoff = -386.9, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

EPA Screening (suspected outliers for Dixon's Test)

MW-3



n = 14

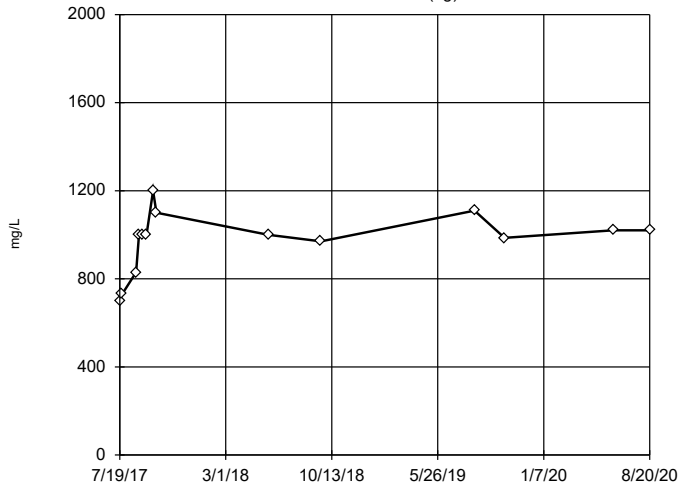
Dixon's will not be run. No suspect values identified or unable to establish suspect values. Mean 362.4, std. dev. 51.54, critical Tn 2.371

Normality test used: Shapiro Wilk@alpha = 0.1
Calculated = 0.9582
Critical = 0.895
The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-4 (bg)



n = 14

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

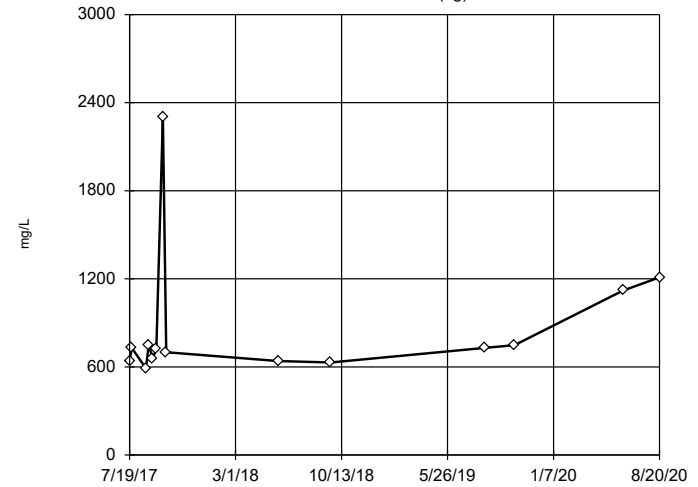
Data were cube transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1368, low cutoff = -852.4, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database

Tukey's Outlier Screening

MW-5 (bg)



n = 14

No outliers found. Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

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

High cutoff = 2692, low cutoff = 217.9, based on IQR multiplier of 3.

Constituent: Total Dissolved Solids Analysis Run 11/4/2020 8:34 AM
Client: GEI Data: Shiras Database